

**UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION**

In re

WESCO AIRCRAFT HOLDINGS, INC., et al.,¹
Debtors.

Case No. 23-90611 (MI)

Chapter 11

(Jointly Administered)

WESCO AIRCRAFT HOLDINGS, INC., et al.,
Plaintiffs,

Adv. Pro. No. 23-03091 (MI)

v.

SSD INVESTMENTS LTD., et al.,
Defendants.

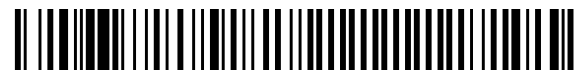
SSD INVESTMENTS LTD., et al.,Counterclaim
Plaintiffs,

v.

WESCO AIRCRAFT HOLDINGS, INC.,et al.,
Counterclaim Defendants.

DEBTORS' WITNESS AND EXHIBIT LIST FOR APRIL 12, 2024, TRIAL

¹ The Debtors operate under the trade name Incora and have previously used the trade names Wesco, Pattonair, Haas, and Adams Aviation. A complete list of the Debtors in these chapter 11 cases, with each one's federal tax identification number and the address of its principal office, is available on the website of the Debtors' noticing agent at <http://www.kccllc.net/Incora/>. The service address for each of the Debtors in these cases is 2601 Meacham Blvd., Ste. 400, Fort Worth, TX 76137.



Main Case No: 23-90611 (MI)	Name of Debtor: Wesco Aircraft Holdings, Inc.
Adversary No: 23-03091 (MI)	Style of Adversary: see caption above
	Judge: Marvin Isgur
Witness:	Courtroom Deputy: Sierra Thomas-Anderson
Edward Morrison	Hearing Date and Time: April 12, 2024, at 10:30 a.m.
Any witness called or designated by any other party	Party's Name: Wesco Aircraft Holdings, Inc.
Any witness necessary to rebut the evidence or testimony of any witness offered or designated by any other party	Attorneys' Name: Susheel Kirpalani, Matt Scheck, Victor Noskov
	Attorneys' Phone: 713-221-7000
	Nature of Proceeding: Wesco Aircraft Holdings, Inc. <i>et al.</i> , v SSD Investments Ltd., <i>et al.</i> Trial

EXHIBITS

TAB	ECF No.	DESCRIPTION	OFFERED	OBJECTION	ADMITTED / NOT ADMITTED	DISPOSITION
1	271	Edward Morrison's Declaration in Support of Summary Judgment Dated September 26, 2023				
2	432, 432-1	Edward Morrison Expert Report Dated November 22, 2023				
3	470	Edward Morrison's Rebuttal Report Dated December 22, 2023				
4	601-8	2026 Secured Notes Indenture Dated November 27, 2019			admitted	
5	601-18	ABL Intercreditor Agreement			admitted	
6	601-24	Notes Security Agreement Dated January 9, 2020			admitted	
7		High-Yield Bonds Market Maker Data (Morrison Report Source)				
8		Reorg: 5 Ways to Conduct Corporate Restructuring Analysis Using Reorg (Morrison Report Source, Morrison Deposition Ex. No. 4)				
9		Edward I Altman, et al., <i>Financial Distress Prediction in an International Context: A Review and Empirical Analysis of Altman's Z-Score Model</i> (Morrison Deposition Ex. No. 7)				
10		Edward I. Altman, <i>A Fifty-Year Retrospective on Credit Risk Models, the Altman Z-score Family of Models, and Their Applications to Financial Markets and Managerial Strategies</i> , (Morrison Deposition Ex. No. 8)				

TAB	ECF No.	DESCRIPTION	OFFERED	OBJECTION	ADMITTED / NOT ADMITTED	DISPOSITION
11		James A. Ohlson, <i>Financial Ratios and Probabilistic Prediction of Bankruptcy</i> (Morrison Deposition Ex. No. 9)				
12		Vincent S.J. Buccola and Greg Nini, <i>The Loan Market Response to Dropdown and Uptier Transactions</i> , (Morrison Deposition Ex. No. 10)				
13		Cooper Standard Indenture Dated May 29, 2023				
14		Edward Altman Public Lecture: “50 Years of Altman Z-Score” in Video Format				
15	705-64	JPMC-00000680 Email from Seketa to Cook et al, March 1, 2022 re: Incora Reorg Article			admitted	
		Any exhibit necessary for impeachment and/or rebuttal purposes necessary for impeachment and/or rebuttal purposes				
		Any exhibit identified or offered by any other party				

Wesco Aircraft Holdings, Inc. reserves the right to supplement or amend this Witness and Exhibit List at any time before the Hearing.

Respectfully submitted this 11th day of April, 2024.

**QUINN EMANUEL URQUHART &
SULLIVAN, LLP**

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*Special Litigation and Conflicts Counsel to the
Debtors and Debtors in Possession*

CERTIFICATE OF SERVICE

I hereby certify that a copy of the attached Witness and Exhibit List was served on the 11th day of April, 2024, via the Clerk of the Court through the CM/ECF system to all parties who have appeared in this case through counsel or who have submitted a request for service by CM/ECF.

/s/ Christopher D. Porter
Christopher D. Porter

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Redemption

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Watchlists

Coverage List

Credit Cloud

To Fundamentals

Recommended Companies

Market Maker

2439 deals found

Deal Overview

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Deal Name	Launch Date	General Sectors	Country	Final Amount (at issue)	Coupon	S&P (at issue)	Moody's (at issue)
Diamond Offshore Drilling Senior Secured Second Lien 2030	12 Sep 2023	Power and Energy	United States of America	\$500.00 million	N/S	N/S	N/S
Fnac Darty senior 2029	12 Sep 2023	Consumer Discretionary	Country	€300.00 million	N/S	N/S	N/S
B&G Foods Senior Secured 2028	12 Sep 2023	Consumer Goods	United States of America	\$500.00 million	N/S	N/S	N/S
Vistra Senior 2031	12 Sep 2023	Utilities	United States of America	\$1,000.00 million	N/S	BB	Baa2
Macquarie AirFinance Senior 2029	11 Sep 2023	Industrial Services	France	\$300.00 million	8.125% (Fixed)	BB+	N/S
NFP Senior Secured 2031	11 Sep 2023	Financials	United States of America	\$300.00 million	N/S	B	B1
WillScot Mobile Mini Senior Secured 2031	11 Sep 2023	Industrial Services	United States of America	\$500.00 million	7.375% (Fixed)	BB-	B2
Coty Senior Secured 2028	11 Sep 2023	Consumer Goods	United States of America	\$500.00 million	N/S	BB	Baa2
Bausch + Lomb Senior Secured 2028	11 Sep 2023	Healthcare	Canada	\$1,400.00 million	N/S	B+	B1
Azerion Senior Secured 2026 (FRNs)	07 Sep 2023	Consumer Discretionary	Netherlands	€175.00 million	N/S	N/S	N/S
Banijay Entertainment Senior Secured 2029	07 Sep 2023	Technology, Media and Telecoms	France	N/S	N/S	N/S	N/S
Greenfire Resources Senior Secured 2028	06 Sep 2023	Power and Energy	Canada	\$300.00 million	N/S	B+	B3
Permian Resources Senior 2031	06 Sep 2023	Power and Energy	United States of America	\$500.00 million	N/S	BB-	B2
Syneos Health Senior Secured 2030	06 Sep 2023	Healthcare	United States of America	\$1,700.00 million	N/S	N/S	N/S

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HT Troplast (Profine)
Senior Secured 2028

Launch Date:
04 Jul 2023

Issuer:
HT Troplast GmbH

Country:
Germany

Amount:
€380.00 million

General Sectors:
Manufacturing

Coupon:
9.375% (Fixed)

Moody's (at issue):
B3

Non-Call Period:
2

S&P (at issue):
N/A

Reports

Aggressive Covenant Terms Scoring (Europe)

Full Report

HT Troplast (Profine) Senior Secured 2028 - Prelim OM

Covenant Analysis

HT Troplast (Profine) Senior Secured 2025

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Watchlists

Coverage List

Credit Cloud

Aggressive Covenant Terms Scoring (Europe)

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HT Troplast (Profine) Senior Secured 2028

Market Average - Non Sponsor Deals (12 Months)

EBITDA / Ratio Flexibility

Leverage

Value Loss: Restricted Payments and Affiliate Transactions

Value Loss: Permitted Investments and Asset Sales

Subordination and Dilution

Redemption Rights

Bond Overview

Basic Information

Issuer and Date

Issuer

HT Troplast GmbH

Master Company

Profine

Launch Date

04 Jul 2023

Pricing Date

06 Jul 2023

Trading Date

06 Jul 2023

Issue Date

17 Jul 2023

Total value of Notes

€380.00 million

Bookrunners

Left Lead

J.P. Morgan

Active Bookrunners

Deutsche Bank
J.P. Morgan

Bookrunners

Commerzbank
Deutsche Bank
J.P. Morgan

Intel

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Corporate Restructuring Analysis Using the Reorg Platform

Mon Oct 25, 2021 4:10 pm Financial Restructuring

In the world of corporate [restructuring](#) analysis, understanding the financial jeopardy that a company, credit or corporation may be experiencing can make or break your next business deal. There is an abundance of intelligence and data that must be collected during the analysis process, and gathering all of it may take hours of work from an entire team of professionals. The Reorg Platform was built specifically for [investment managers](#), [investment bankers](#), [lawyers](#), [professional services](#) and [corporations](#) to help them make more informed decisions for themselves and their clients. Here are 5 ways in which our platform can assist you and your team in conducting corporate restructuring analysis.

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Financial Distress Prediction in an International Context: A Review and Empirical Analysis of Altman's Z-Score Model

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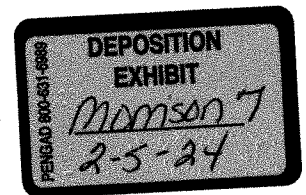
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Abstract

This paper assesses the classification performance of the Z-Score model in predicting bankruptcy and other types of firm distress, with the goal of examining the model's usefulness for all parties, especially banks that operate internationally and need to assess the failure risk of firms. We analyze the performance of the Z-Score model for firms from 31 European and three non-European countries using different modifications of the original model. This study is the first to offer such a comprehensive international analysis. Except for the United States and China, the firms in the sample are primarily private, and include non-financial companies across all industrial sectors. We use the original *Z''*-Score model developed by Altman, *Corporate Financial Distress: A Complete Guide to Predicting, Avoiding, and Dealing with Bankruptcy* (1983) for private and public manufacturing and non-manufacturing firms. While there is some evidence that Z-Score models of bankruptcy prediction have been outperformed by competing market-based or hazard models, in other studies, Z-Score models perform very well. With-

The authors are grateful to the Editor, Richard Levich, and to the anonymous referees for many helpful comments and suggestions. We also wish to thank participants at the 2014 International Risk Management Conference (IRMC) in Warsaw for useful discussions. Laitinen and Suvas thank the Foundation for Economic Education, and Jenny and Antti Wihuri Foundation for financial support. Laitinen also thanks OP-Pohjola Group Research Foundation for support.

out a comprehensive international comparison, however, the results of competing models are difficult to generalize. This study offers evidence that the general Z-Score model works reasonably well for most countries (the prediction accuracy is approximately 0.75) and classification accuracy can be improved further (above 0.90) by using country-specific estimation that incorporates additional variables.

1. Introduction

The first multivariate bankruptcy prediction model was developed by Altman (1968) in the late 1960s. After this pioneering work, the multivariate approach to failure prediction spread worldwide among researchers in finance, banking, and credit risk. Failure prediction models are important tools for bankers, investors, asset managers, rating agencies, and even distressed firms themselves. The banking industry, as the main provider of financing in the economy, is especially interested in minimizing the level of non-performing loans in order to maximize profit on credit activity, and banks seek to reduce their own risk of default. Another issue of interest for bankers is capital adequacy and the internal ratings-based approach encouraged by the Basel Accords. The Z-Score model has become a prototype for many of these models. Asset managers and investors need reliable tools that can help them select appropriate companies for their portfolios. Financial distress is detrimental to investor returns, but risk may provide opportunities for high returns on short-sale strategies. Rating agencies assess the risk of the entities and of securities issues, and thus, they need a tool to predict default. Altman (1983) suggested that the management of distressed firms can utilize the Z-Score model as a guide to financial turnaround.

The approach used for bankruptcy prediction has evolved over time. Beaver (1966, 1968) used univariate analysis for selected ratios and found that some had very good predictive power. Altman (1968) made strides by developing a multiple discriminant analysis model (MDA) called the Z-Score model. The next two decades saw additional contributions to financial distress research.¹ For example, Ohlson (1980) proposed a logit model,² Taffler (1984) offered a Z-Score model for the United Kingdom, and Zmijewski (1984)³ used a probit approach. Dimitras et al. (1996) reviewed 47 studies on business prediction models, summarizing the methods employed and the variety of ratios used. Discriminant analysis was the prevailing method, and the most important financial ratios came from the solvency category, with profitability ratios also being important.

Balcaen and Ooghe (2006) reviewed 43 models of business failure prediction which they classified into four categories: univariate models (1); risk index models (2); MDA models (21); and conditional probability models (19). However, their review omitted the rapidly growing type of models based on option pricing theory and contingent claims (e.g., Vassalou and Xing, 2004; commercialized into Kealhofer, McQuown and Vasicek's model, known as the KMV model), as well as hazard models (e.g., Shumway, 2001). Kumar and Ravi (2007) reviewed 128 statistical and artificial intelligence models for bank and firm bankruptcy predictions, paying special attention to the techniques used in the different models. These authors noted that neural networks were the most popular intelligence technique. In their review, Jackson and Wood (2013) presented the frequency of occurrence of specific forecasting techniques in the prior literature. The five most popular techniques were as follows: (1) multiple discriminant analysis, (2) logit models, (3) neural networks, (4) contingent claims, and (5) univariate analysis.

Recent reviews of the efficacy of these models have been offered by Agarwal and Taffler (2008), Das et al. (2009), and Bauer and Agarwal (2014). These reviews take into account the performance of accounting-based, market-based, and hazard models. These three model types prevail in the literature. According to Agarwal and Taffler (2008), there is little difference in the predictive accuracy of accounting-based and market-based models; however, the use of accounting-based models allows for a higher level of risk-adjusted return on credit activity. Das et al. (2009) showed that accounting-based models perform comparably to the Merton structural, market-based approach for credit default spread (CDS) estimation. However, a comprehensive model, which used both sources of variables, outperformed the other models. In Bauer and Agarwal (2014), hazard models using accounting and market information (Shumway, 2001; Campbell et al., 2008) were compared with two other approaches: the original Taffler (1984) Z-score model, which was tested by Agarwal and Taffler (2008), and a contingent claims model using Bharath and Shumway's (2008) approach. Using U.K. data, the hazard models were superior in bankruptcy prediction accuracy, ROC (Receiver Operating Characteristic) analysis, and information content.

Even though the Z-Score model was developed more than 45 years ago and many alternative failure prediction models exist, the Z-Score model continues to be used worldwide as a main or supporting tool for bankruptcy or financial distress prediction and analysis both in

research and in practice. We focus on accounting-based versions of the Z-Score models, which even though they are occasionally outperformed by other models, do not rely on market data. Most firms operating in business are privately held; hence, only accounting data and no market data (e.g., stock prices) are available. Private firms are usually financed by banks, which are obligated to assess their creditworthiness and monitor their performance. In the case of internationally active banks, from a regulatory perspective it is especially important to use a single model for distress prediction, provisioning, and economic capital calculation. According to current Basel regulatory requirements, banks need to validate their distress prediction models and document their efficacy. Thus, it is important to analyze the performance of accounting-based models in an international context.

In our study, we use a large international sample of firms to assess the classification performance of the Z-Score model in bankruptcy prediction.⁴ We analyze the model's performance for firms from 31 European and three non-European countries (China, Colombia and the United States). These firms are mostly privately held, and a large number are from non-manufacturing industries. We use the version of the model developed by Altman (1983) for private and public manufacturing and non-manufacturing firms (the Z''-Score model). Such an extensive international analysis of the Z-Score model's performance has not been presented to date. We regard our review and analysis as important contributions to the economic literature.

The remainder of the paper is structured as follows. In the next section, we summarize the original Z-Score model (Altman, 1968) and its extension for private firms, that is, the Z'-Score and Z''-Score models (Altman, 1983). In the third section, we present the results and conclusions from the literature review on these models. The fourth section presents seven hypotheses on the performance of the Z''-Score model that we will subject to empirical analysis. In the fifth section, we discuss the empirical data and statistical methods, while the sixth section presents empirical findings. Finally, the seventh section summarizes the study.

2. Classic Z-Score Models

2.1. Z-Score Model for Public Firms

Altman's (1968) initial sample was composed of 66 corporations, with 33 firms in each of two groups. The bankrupt group (Group 1) con-

sisted of manufacturers that filed bankruptcy petitions under Chapter X of the National Bankruptcy Act during the 1946–1965 period. The mean asset size of these firms was 6.4 million USD, ranging between 0.7 and 25.9 million USD. Altman recognized that this group was not homogenous with respect to size and industry, although all firms were relatively small and from manufacturing industries. He attempted to carefully select non-bankrupt firms (Group 2). Group 2 consisted of a paired sample of manufacturing firms chosen on a stratified random basis. These firms were stratified by industry and size, with the asset size range restricted to 1–25 million USD. Altman eliminated small firms (less than 1 million U.S.A. dollars in total assets) because of a lack of data and very large firms because of the rarity of bankruptcies among these firms in that period. He did not match the asset size of the two groups exactly, and therefore, the firms in Group 2 were slightly larger than those in Group 1. The data collected for the firms in both groups were from the same years. For Group 1, the data were derived from financial statements one reporting period prior to bankruptcy.

Using financial statements, Altman compiled a list of 22 potentially important financial ratios for evaluation. He classified these variables into five standard ratio categories: liquidity, profitability, leverage, solvency, and activity. These ratios were chosen based on their popularity in the literature and their potential relevance to the study. The final discriminant function estimated by Altman (1968) is as follows:

$$Z = 0.012 \cdot X_1 + 0.014 \cdot X_2 + 0.033 \cdot X_3 + 0.006 \cdot X_4 + 0.999 \cdot X_5 \quad (1)$$

where X_1 = Working Capital/Total Assets; X_2 = Retained Earnings/Total Assets; X_3 = Earnings before Interest and Taxes/Total Assets; X_4 = Market Value of Equity/Book Value of Total Liabilities; X_5 = Sales/Total Assets; Z = Overall Index.

2.2. Z'-Score and Z''-Score Models for Private Firms

The original Z-Score model was based on the market value of the firm and was thus applicable only to publicly traded companies. Altman (1983) emphasized that the Z-Score model is intended for publicly traded firms and that *ad hoc* adjustments are not scientifically valid. Altman (1983) advocated a complete re-estimation of the model, sub-

stituting the book value of equity for the market value in X_4 . Using the same data, Altman extracted the following revised Z' -Score model:

$$Z' = 0.717 \cdot X_1 + 0.847 \cdot X_2 + 3.107 \cdot X_3 + 0.420 \cdot X_4 + 0.998 \cdot X_5 \quad (2)$$

where X_4 = Book value of equity/Book value of total liabilities, with the other variables the same as those in the original (1968) Z -Score model.

Due to the lack of a private firm database, Altman did not test the Z' -Score model on a secondary sample. However, he analyzed the accuracy of a four-variable Z'' -Score model that excluded the Sales/Total assets ratio, X_5 , from the revised model because of a potential industry effect that is more likely to take place when this kind of industry-sensitive variable (asset turnover) is included in the model. Altman then estimated the following four-variable Z'' -Score model (Altman, 1983):

$$Z'' = 3.25 + 6.56 \cdot X_1 + 3.26 \cdot X_2 + 6.72 \cdot X_3 + 1.05 \cdot X_4 \quad (3)$$

The EBIT/Total assets ratio, X_3 , contributed most to the discrimination power in this version of the model. The classification results for the Z'' -Score model were identical to the revised five-variable Z' -Score model. In the current study, our empirical analysis focuses on the performance of the Z'' -Score model version in predicting bankruptcy, where it has its widest scope, as it is intended for both privately held and publicly listed firms and for both manufacturing and non-manufacturing firms.

3. Survey of Literature Related to the Altman Z -Score Model

We focus on papers published after 2000 in prominent international journals and books.⁵ Of the many articles and books identified, we selected 31 articles in which the Z -Score was either used as a failure prediction proxy or assessed mostly in terms of predictive ability. Of the 31 studies, Altman's Z -Score model was used in 16 cases as the measure of distress or of financial strength.⁶ In 13 studies, Altman's original model was modified and (or) verified, including re-estimation, and in two cases, it was used solely for the robustness check. As Pindado et al. (2008) noted, the Z -Score was also used for other purposes,

such as the evaluation of the costs and benefits of covenants in bonds, the choice of debt type (bank versus non-bank, private or public), and the relationship between investment and internal funds. We focused on this part of the literature that verified and (or) modified Altman's original model. The broad use of the Z-Score model for measuring financial distress and performing robustness checks indicates its acceptability as a reasonable, simple, and consistent measure of distressed firms.

The most common modification to the Z-Score model was the use of other estimation techniques or country-specific data. The use of Altman's ratios in combination with techniques other than MDA improved its prediction capability. The application of new data on both United States and non-US firms also improved model performance. Kwak et al. (2005) used Multiple Criteria Linear Programming (MCLP) to model 5 Altman and 9 Ohlson variables with data on bankrupt US firms from 1992 to 1998 and nearly six times more matched U.S.A. control firms. The MCLP approach performed better than Altman's original model and gave results similar to or better than those of Ohlson's original model. The original models were not recalculated, and the authors referred solely to their original prediction rates.

Merkevicius et al. (2006), using data on United States and Lithuanian firms, developed a hybrid artificial discriminant model combining MDA and an unsupervised learning artificial neural network. This hybrid SOM-Altman model reached a high prediction rate of 92.35 per cent. Xu and Zhang (2009) applied Altman's Z-score, Ohlson's O-score, and Merton's distance-to-default (*D*-score) models to Japanese firms to check whether these models are useful for bankruptcy prediction in Japan. They also "merged" these models into a new *C*-score model. They then introduced variables unique to Japan to check whether corporate structure variables have any impact on the probability of bankruptcy; they called this the *X*-score model. These two models were useful for Japanese firms in predicting bankruptcy, but the market-based model was the most successful. In summary, the *C*-score and *X*-score (with country-specific variables) models improved bankruptcy prediction.

Tinoco and Wilson (2013) used the original Z-Score as one of the benchmarks to assess the performance of their model developed for U.K. listed companies with combined accounting, market, and macroeconomic data. Altman's Z-Score presented very good classification

accuracy in the case of financially distressed firms (81 versus 87 per cent for the new model); however, it was less correct for non-distressed firm's prediction. Another modification was introduced by Lyandres and Zhdanov (2013), who posed the question of whether the inclusion of variables related to investment opportunities improved the predictive power of three models (Altman's Z-score model and Zmijewski's and Shumway's models). They used three proxies for investment opportunities (market-to-book, value-to-book, and R&D-to-assets). The measures of investment opportunities were linked to the likelihood of default. The inclusion of either of these measures improved the out-of-sample forecasting ability of all three.

The verification of Altman's model concentrated on its efficacy or on how it compares with other accounting-based, market-based, or hazard models. However, although the original Z-Score model was not solely based on accounting data because the market value of equity was utilized, we classify it here as accounting-based. Grice and Ingram (2001) used a novel dataset of US firms and posed three questions about the efficacy of Altman's model, concluding that the prediction accuracy of Altman's model had declined over time and that the coefficients of the model had significantly changed, which means that the relation between the financial ratios and the signs of financial distress had changed over time. The model was sensitive to industry classification (more efficient for manufacturing firms than for non-manufacturing firms) but was not sensitive to the type of financial distress. Similar conclusions were drawn by Grice and Dugan (2003) regarding Ohlson's (1980) and Zmijewski's (1984) models.

Hillegeist et al. (2004) compared Altman's Z-score and Ohlson's O-score (with original and updated coefficients) with a model based on Black-Scholes-Merton (BSM) option pricing (a so-called BSM-Prob model). Hillegeist et al. used relative information content tests to compare the out-of-sample performance of these various models and determined that BSM-Prob outperformed the alternative accounting-based models. The conclusions were robust to various modifications of accounting-based models, such as updated coefficients, industry effects, and the separation of variables. Chava and Jarrow (2004) employed an extended bankruptcy database of U.S.A. listed firms to test the superiority of Shumway's model (2001) over Altman's (1968) and Zmijewski's (1984) models. The authors re-estimated the models over the 1962–1990 period and forecasted bankruptcies over the 1991–1999 period. In the case of Shumway's model, 74.4 per cent (in the first decile)

of the bankruptcies were correctly identified; with Altman's model, 63.2 per cent; and with Zmijewski's model, 43.2 per cent. Shumway's market-based model also outperformed accounting-based models in terms of the ROC curve (0.91).

Reisz and Perlich (2007) developed a model incorporating barrier options for bankruptcy prediction and compared its discriminatory power with other market-based models and Altman's *Z*-Score and *Z'*-Score. The dataset covered nearly 6000 industrial firms over the 1988–2002 period. The authors documented the superiority of Altman's *Z*-Score and *Z'*-Score models for short-term (up to 1 year) bankruptcy prediction. For medium- and long-term bankruptcy prediction, their barrier option model outperformed the other models.

Pindado et al. (2008) developed an *ex ante* model for the estimation of financial distress likelihood (FDL) using a panel data methodology and presented a financially (not legally) based definition of distress. Their sample covered 1,583 U.S.A. companies and 2,250 companies from other G-7 countries for the 1990–2002 period. They used a re-estimated *Z*-Score as a benchmark. The FDL model outperformed the *Z*-Score model in terms of stability and classification power for different countries and periods. In the case of the re-estimated *Z*-Score model, only profitability and retained earnings maintained their significance for different years and countries.

Wu et al. (2010) evaluated the performance of five models (Altman, 1968; Ohlson, 1980; Zmijewski, 1984; Shumway, 2001; Hillegeist et al., 2004) using an up-to-date dataset for U.S.A. listed firms. Based on these models, the authors built their own integrated model, that is, a multi-period logit model with an expanded set of variables. The integrated model, which combined accounting and market data, as well as firms' characteristics, outperformed the other models. Altman's *Z*-score performed poorly compared with the other four models. Shumway's model performed best, Hillegeist et al.'s model performed adequately, and Ohlson's and Zmijewski's models performed adequately, although their performance deteriorated over time.

Jackson and Wood (2013) tested 13 different models of bankruptcy prediction and assessed their efficacy using the ROC curve. They selected three single-variable models, three accounting-based models (including Altman's *Z*-Score) in two versions (with updated coefficients and a neural network approach), and four contingent claims models, and the latter group outperformed the other models. The four best models were contingent claims models based on European call and

barrier options. Although the predictive performance improved with the application of the neural network to accounting-based models, it was still lower than with the market-based models.

Acosta-González and Fernández-Rodríguez (2014) used genetic algorithms with the Schwarz information criterion (GASIC) for variable selection combined with the logit model for bankruptcy prediction. Altman's Z-Score model was used as one of two benchmarks for the authors' model evaluation. For one-step-ahead forecasting, Altman's model was better at predicting failed firms, but the type II error was high. For two- and three-steps-ahead forecasts, the performance of the models was similar for failed firms, but for non-failed firms, and the prediction accuracy of Altman's model was worse. For four-steps-ahead forecasts, the GASIC model outperformed the other models for failed firms, but it performed comparably for non-failed firms.

In general, for the 31 articles we reviewed, Altman's Z-Score model underperformed compared with market-based models, but evidence indicated that it performed well for short-term distress prediction. The question of whether market-based models perform better than accounting-based models has been raised many times (e.g., discussion in Das et al., 2009; Bauer and Agarwal, 2014). Our purpose is not to contribute to this strand of research but rather to focus on the accounting-based approach. In this study, we primarily analyze privately held firms; by definition, there are no market data for these firms. In this case, an accounting-based approach is the only solution applicable by banks as lenders, or by investors holding debt securities of firms not listed on the stock exchange. Thus far, most studies have concentrated on the U.S.A. market; only a few of them have used data from other countries, such as Japan, the U.K., Lithuania, or the G-7 countries. Our analysis is a significant extension of the previous research.

4. Methodology and Research Hypotheses

The literature survey shows that the Z-Score model (publicly traded firms), the Z'-Score model (private manufacturing firms), and the Z''-Score model (private and publicly traded manufacturing and non-manufacturing firms) have been adapted for different purposes. In this study, we are interested first in assessing the performance of the original Z''-Score model in classifying bankrupt and non-bankrupt firms in an international context, with special focus on the European market.

However, we also validate the results in a set of non-European countries to generalize the results for circumstances outside Europe. Second, we re-estimate the model using extensive international data and then use the re-estimated Z'' -Score model as a benchmark for assessing the effects of different factors on the model's performance in terms of classification accuracy. We assess the effects of the following five factors on this performance: year of bankruptcy, size of firms, age of firms, industry, and country of origin. We test a set of hypotheses based on the effects of the model on performance on two different levels. First, we test a set of hypotheses on a pooled set of all firms and, second, on data from each country individually. Compared with previous research, this study's contribution is its focus on an international context, not simply model application or re-estimation of a given country's data. Because we focus on the performance of the Z'' -Score model when using a large body of international data, the research hypotheses are of a technical nature and are given as follows.

4.1. H1: Obsolescence of the Coefficients

The Z'' -Score model was originally estimated using the same sample of firms used to develop the Z -Score model. The bankruptcies in the estimation data occurred during the 1946–1965 period. Thus, the oldest observations are from nearly seventy years ago, during the post-war period. Altman (1983) recommended utilizing data as near to the present as possible when developing a bankruptcy prediction model. It is obvious that firms' financial behavior and their business environment have significantly changed since then. The importance of the financial ratios, as reflected by the coefficients of the model, may differ from their original importance. Therefore, we suggest, as the first hypothesis (*H1*), that the re-estimation of the coefficients of the four original variables of the Z'' -Score model will improve the classification performance of the model in an international context. This hypothesis is supported by the previous research (e.g., Grice and Ingram, 2001) and by practice. *H1* aims to support this evidence on the international level and is expressed as follows:

H1: Re-estimating the coefficients of the Z'' -Score model improves its classification accuracy.

4.2. *H2: Method of Estimation*

The original Z'' -Score model has been estimated using MDA. However, MDA is based on the ordinary least squares (OLS) method and thus requires assumptions of multinormality, homoscedasticity, and linearity, which are not often met in empirical financial ratio analysis. We re-estimate the Z'' -Score model using logistic regression analysis (LRA) to assess the effect of the estimation method. LRA does not require most of the restricting assumptions of MDA. In LRA, the multivariate normality of the independent variables is not required, nor are homoscedasticity and linearity. For the sake of OLS, MDA can be more useful than LRA for small samples, such as the original sample of 66 firms used in the estimation of the Z'' -Score model. However, in a large sample, LRA may potentially perform better. In this study, we use large samples, which is advantageous for LRA. Our second hypothesis (*H2*) is that the classification performance of the re-estimated Z'' -Score model will improve when it is estimated using LRA instead of MDA. The model re-estimated for the original variables using LRA and all pooled data are called the Z'' -Score LR model. The performance of this re-estimated model is used as the benchmark for further analyses. Thus, the second hypothesis is as follows:

H2: The prediction accuracy of the logistic regression version of the Z'' -Score model is higher than that of the multiple discriminant analysis version.

4.3. *H3: Bankruptcy Year*

The model based on the relationship between bankruptcy and financial ratios is likely to be affected by the macroeconomic environment. These effects may significantly decrease the classification accuracy of the model. If the model is estimated using data from 1 year and will be applied to data from another year, the validity of the model can be questioned. In terms of economic growth, credit policy, and interest rates, business cycles can affect the boundary between bankrupt and non-bankrupt firms. The original Z'' -Score model is estimated using data from the 1946–1965 period, which includes several business cycles. Therefore, the model is not focused on any specific stage of a cycle

and does not explicitly take into account the bankruptcy year. Altman (1983) suggested gathering data from firms for the most recent few years when developing a prediction model. In this study, the benchmark Z'' -Score LR model is estimated for a shorter period than in the original estimation, although it covers several recent years for different stages of the business cycle in different countries. The third hypothesis ($H3$) is that the classification accuracy of the benchmark model can be increased by explicitly taking into account the year of bankruptcy in the model estimation. The third hypothesis is as follows:

$H3$: The model's prediction accuracy is higher when the effect of the year of bankruptcy is included.

4.4. $H4$: Size of the Firm

The boundary between bankrupt and non-bankrupt firms is different for small and large firms, which decreases the performance of the model estimation when data from one size category are applied to another size category. For the bankrupt and non-bankrupt firms in the original data for Z'' -Score model estimation, asset sizes ranged between approximately 1 and 25 million U.S.A. dollars. The data did not include very small or very large firms. Altman (1983) regarded the suitability of the original Z -Score model (and, likewise, the Z'' -Score model) for all firms as debatable because of this omission. In the current study, the benchmark Z'' -Score LR model is estimated for data from many size categories, from very small to very large firms. The fourth hypothesis ($H4$) assumes that the classification performance of the uniform benchmark LR model based on the original four financial variables of the Z'' -Score model is improved when the size category of the firm is explicitly taken into account. Thus, we present the fourth hypothesis:

$H4$: The model's prediction accuracy is higher when the effect of size is included.

4.5. $H5$: Age of the Firm

International insolvency statistics generally show that bankruptcy risk is a function of the age of the firm. Very young firms typically show

very high risk. The original Z'' -Score model does not explicitly take age into account. However, Altman (1983) noted that the age of a firm is implicitly considered in the Retained Earnings/Total Assets ratio (X_2), which was regarded as a new ratio in the bankruptcy prediction context. A relatively young firm will probably show a low ratio because it has not had time to build up cumulative profits. Thus, a young firm is, to some degree, discriminated against in the model, and its likelihood of being classified as bankrupt is relatively higher than that of an older firm. The incidence of failure is much higher in the early years of a firm. Although the age of the firm is implicitly taken into account in X_2 , we expect that an explicit consideration of age will improve the classification accuracy by controlling for the age factor. The fifth hypothesis ($H5$) proposes that the performance of the uniform benchmark model based on the original four financial variables of the Z'' -Score model increases when the age of the firm is explicitly taken into account. The fifth hypothesis is as follows:

$H5$: The model's prediction accuracy is higher when the effect of firm age is included.

4.6. $H6$: Industry of the Firm

The original Z' -Score model was estimated only for manufacturing firms. Altman (1983) stated that it would be ideal to develop a bankruptcy prediction model utilizing a homogenous group of bankrupt firms. If we are interested in a particular industry grouping, we should gather data from bankrupt and non-bankrupt firms in that grouping. Previous studies show that financial distress analysis is influenced by the industry effect (Smith and Liou, 2007). Firms in different industries tend to report different levels of the same financial ratios, which may have an effect on the boundary between bankrupt and non-bankrupt firms. This industry effect may be present in the Z' -Score model, especially due to the Sales/Total Assets ratio (X_5), which showed the least significance on a univariate basis while making a very significant contribution to the discriminant power of the multivariate model. Altman (1983) recognized the potential industry effect due to the wide variation among industries in asset turnover and specified the Z'' -Score model without X_5 . However, the Z'' -Score model was also estimated using the original sample of manufacturing firms. In our analysis, the

uniform benchmark model based on the original four financial variables of the *Z*'-Score model is estimated for a statistical sample representing different industries. The sixth hypothesis (*H6*) assumes that an explicit consideration of industry will improve the classification accuracy of this benchmark model. *H6* can be expressed in the following form:

H6: The model's prediction accuracy is higher when the effect of industry is included.

4.7. H7: Country of Origin

The original *Z*'-Score model has been estimated only for U.S.A. firms. It can be expected that the international applicability of the model to other countries is affected by country-specific differences. The economic environment, legislation, culture, financial markets, and accounting practices in a country may affect the financial behavior of firms and the boundary between bankrupt and non-bankrupt firms. These factors may weaken the classification performance of the model for countries other than that for which the model was originally estimated (Ooghe and Balcaen, 2007). The seventh hypothesis (*H7*) assumes that explicitly taking the country of origin of a firm into account will improve the classification accuracy of the benchmark model. In our empirical study, the country effect is assessed by including a variable for country risk. The seventh hypothesis is as follows:

H7: The model's prediction accuracy is higher when the effect of country risk is included.

5. Empirical Data and Statistical Methods

5.1. Sample of Firms

The principal data for this study were extracted from the ORBIS databases of Bureau Van Dijk (BvD). ORBIS Europe is a commercial database that, at the moment of sampling, contained administrative information on more than 50 million European firms. However, income statement and balance sheet information was available for

approximately 8 million companies. More than 99 per cent of the companies covered in this database are private companies from various industries, justifying the use of the Z'' -Score model instead of the original Z -Score model. The Z'' -Score model was originally made robust across all industrial groupings and for both private and public entities (Altman, 1983, 2014; Altman and Hotchkiss, 2006). Because we do not want to limit the scope of the Z'' -Score model in this study, we retain both private and public firms from all industrial groupings.

The ORBIS formats have been derived from the world's most commonly used formats for the presentation of business accounts (Ribeiro et al., 2010). International comparability may be a problem when administrative firm-level data are pooled across countries. Although the definition of variables is usually less harmonized for administrative data, this is less of a problem in the ORBIS database because of the common international format of balance sheets. For example, although some discrepancies in profit/loss statements may arise because of differences in fiscal systems across countries, balance sheet variables largely adhere to international standards.

A number of factors influence the international applicability of bankruptcy prediction models: accounting legislation and practice, creditor rights and investor protection, judicial efficiency, corporate governance, bankruptcy protection and insolvency management, and firm risk-taking. These factors strongly differ between European and non-European countries. Therefore, we aim to test the performance of the Z'' -Score model outside Europe. First, it is particularly important to include the US because it is the country of origin for the Z'' -Score model and because it has the largest market capitalization in the world. Second, a central motivation in developing the modified Z'' -Score model was to make it applicable to emerging market companies. We include firms from China and Colombia, which represent two very culturally and institutionally dissimilar emerging market countries. For other non-European countries, sufficient bankruptcy data (more than 60 bankrupt firms, i.e., the limit we set for European countries) from ORBIS World were not available. Thus, the results are also estimated and tested for three non-European countries (the United States, China, and Colombia) to gain a more global view of the Z'' -Score model's performance. The samples of firms from these countries were extracted from ORBIS World, which contains middle-sized (total assets over 1.5 million EUR) and larger firms from around the world.

Several requirements are set for the statistical sampling of the empirical data. First, we require that the firm to be selected be an industrial (non-financial) company. Second, its owners must have limited liability (so partnerships and sole proprietors are left out of the study). Third, we set a minimum requirement for the size of the firm. Because the financial ratios of very small firms are generally too unstable for a failure prediction model, these firms are excluded (see Balcaen and Ooghe, 2006). We require that a firm's total assets must have exceeded 100 thousand EUR at least once in the available time series. Fourth, we include in our estimation sample firms from all European countries and three pre-selected non-European countries where the number of failed firms is greater than 60. If the number of failed firms for any European country is less than 60, the firms from this country are included only in the test sample. For qualifying European countries, firms are randomly classified in the estimation and test samples so that the number of firms is approximately equal in both samples. Thus, our estimation data include firms from 28 European and three non-European countries. Fifth, all failed firms that fulfill the above requirements are included in our samples. However, if the number of non-failed firms in a country is very high, a sample is randomly selected from that country. Finally, the time span of fiscal years potentially available for this study ranges from 2002 to 2010. Because the most recent financial statements for failed firms in the database are from a financial period within 2007 and 2010, earlier years are also excluded for non-failed firms for comparability. All qualifying observations of non-failed firms from 2007 to 2010 are included in the datasets. We restrict the analyses of failed firms to the most recent financial statements available before failure. The four independent variables of the Z'' -Score model were winsorized at 1 and 99 per cent to minimize outliers.

Table 1 shows the resulting number of non-failed and failed firms in the estimation data and test data by country. The estimation sample includes data from 2,602,563 non-failed and 38,215 failed firms from 28 European and three non-European countries. The test sample is slightly larger because it includes data from 31 European and three non-European countries. For the country of origin of the Z'' -Score model, the United States, the estimation sample includes only 56 bankrupt firms. The available U.S.A. data consist only of listed (and delisted) firms. From China, there are three sub-samples. Only 32 public firms with special treatment (ST)⁷ status are included in the estima-

Table 1. *Number of Observations by Country*

<i>Country</i>	<i>Estimation data</i>		<i>Test data</i>	
	<i>Non-failed</i>	<i>Failed</i>	<i>Non-failed</i>	<i>Failed</i>
Austria (AT)	7,430	55	7,526	44
Belgium (BE)	179,979	2,994	179,818	2,944
Bosnia (BA)	29,391	35	29,139	32
Bulgaria (BG)	50,041	48	42,351	44
China (CN)			39,315	198
China, delisted dataset, DL			16,291	29
China, ST data	846	16	1,020	16
Colombia (CO)	8,366	139	6,982	125
Greece (GR)			51,763	28
Croatia (HR)	59,541	249	58,478	275
Czech Republic (CZ)	92,835	556	92,562	564
Denmark (DK)	167,934	1,334	168,538	1,398
Estonia (EE)	34,313	234	34,196	242
Finland (FI)	90,878	481	91,227	459
France (FR)	160,749	6,124	161,653	6,318
Germany (DE)	98,814	910	99,496	921
Hungary (HU)	19,421	303	20,155	313
Iceland (IS)	17,399	248	17,624	243
Ireland (IE)	6,665	121	6,406	139
Italy (IT)	167,113	8,101	166,258	8,124
Latvia (LV)	8,064	433	8,241	477
Lithuania (LT)			10,000	56
Netherlands (NL)	20,885	154	15,854	147
Norway (NO)	172,467	1,294	170,985	1,206
Poland (PL)	87,200	291	86,233	264
Portugal (PT)	180,114	3,390	178,646	3,422
Romania (RO)	161,992	97	164,259	93
Russian Federation (RU)	116,903	2,534	115,711	2,481
Serbia (RS)			100,100	68
Slovakia (SK)	7,856	120	7,788	124
Slovenia (SI)	14,419	59	14,081	41
Spain (ES)	156,746	3,036	158,122	2,991
Sweden (SE)	169,810	2,256	169,999	2,314
Ukraine (UA)	133,342	1,787	133,980	1,765
United Kingdom (GB)	171,493	760	170,930	716
U.K. (GB), liquidation dataset			342,423	4,990
United States (US)	9,557	56	9,929	53
Total	2,602,563	38,215	3,148,079	43,664

tion sample.⁸ The Chinese datasets of predominantly private firms (CN) and of public firms with delisted (DL) failure status are analyzed separately only for the test data.⁹ ST firms are listed firms suffering from serious financial difficulties. Excluding the special U.S.A. data and the two non-private Chinese datasets, 99.4 per cent of the observations in the data are private firms.

5.2. Status of Failed Firms

ORBIS has five classes for potentially active firms (active, default of payment, receivership, dormant, and branch) and seven classes for inactive firms that no longer carry out business activities (bankruptcy, dissolved, dissolved-merger, dissolved-demerger, in liquidation, branch, and no precision). Among these classes, only active is selected to represent non-distressed firms. In selecting the failed firms, we try to avoid ambiguity by considering (with exceptions described below) a firm failed if its status in ORBIS is stated as bankruptcy. However, because of the small number of bankrupt firms in some countries, we also consider receivership (active) firms as failed even if they are active. These firms generally suffer from serious financial distress. However, firms in liquidation are generally not included in the sample of failed firms. Firms in liquidation may, depending on the country, contain firms that have ceased activities due to reasons other than failure (mergers, discontinuing the operations of a daughter company or of a foreign branch, etc.). Therefore, for most countries, we select only firms that are coded as being bankrupt or under receivership. However, there are a number of special cases where failed firms are coded under a different status heading. These countries or samples are the following:

<i>Country</i>	<i>Status categories</i>
Bulgaria	In liquidation, Bankruptcy
Denmark	Inactive (no precision)
Greece	Active (receivership), In liquidation, Bankruptcy
Ireland	In liquidation, Active (receivership)
Norway	In liquidation
Slovenia	In liquidation
Spain	Active (receivership), In liquidation, Bankruptcy
Ukraine	In liquidation, Bankruptcy
U.K., liquidation set	In liquidation
China, ST	Active (special treatment)
China, delisted, DL	Active (delisted)

If no such category of failed firms could be identified, that country was excluded from the study (for example, Switzerland). If a country had only a very small number of failed firms, it was dropped from the study (typically small countries, including Luxembourg, Liechtenstein, and Montenegro). It should also be noted that the status classes (including the bankruptcy category) are not completely homogenous within European countries due to different legislations, although there

are obvious similarities in insolvency acts (Philippe et al., 2002). China is a special case because it includes samples with three different criteria of failure (bankruptcy, special treatment, and delisted). Additionally, for the United Kingdom, there are two different samples (liquidation and receivership).

5.3. Statistical Methods

In this study, seven research hypotheses are drawn for statistical testing. The statistical analysis begins with calculating the original Z' -Score for the firms in the data, as in equation (3). The classification performance of the original model is assessed by the AUC (Area Under Curve) measure extracted from the ROC curve. AUC has a close connection with the Accuracy Ratio (AR) because $AR = 2 \cdot AUC - 1$. AR equals 0 for a random model, 1 for a perfect model, and 0.5 for a model with an average classification performance. SAS software (SAS Institute Inc., Cary, NC, USA) is used for all statistical analyses.

The first hypothesis (*H1*) assumes that the coefficients of the original model are obsolete. *H1* is tested by re-estimating the coefficients of the Z' -Score model using the original statistical method (multiple discriminant analysis, or MDA). The problem is that the estimation sample includes different numbers of failed and non-failed firms from 31 countries. In the original Z' -Score sample (1983), equal numbers of bankrupt and non-bankrupt firms were selected from the US. Following the characteristics of these data. Therefore, we weight the failed and non-failed firms equally. In so doing, the non-proportional sampling from different countries will not affect the re-estimated model. The number of firms from different countries, however, varies significantly, leading to greater weights for larger countries. To avoid this problem, the observations are also weighted so that each country has an equal weight in the analysis. Then, the coefficients of the Z' -Score model are re-estimated using these weighted data, and the resulting AUC is compared with that based on the original model.

The second hypothesis (*H2*) tests whether the classification performance of the re-estimated Z' -Score model improves when it is re-estimated using logistic regression analysis (LRA), which is based on less-restrictive statistical assumptions than MDA. In this estimation, the dependent variable $Y = 0$ for non-failed firms and $Y = 1$ for failed firms. LRA does not require that independent variables be multivariate normal or that groups have equal covariance matrices, which are basic

assumptions in MDA (Hosmer and Lemeshow, 1989). LRA creates a (logit) score L for every firm. It is assumed that the independent variables are linearly related to L . This score or logit is used to determine the conditional probability of failure as follows:

$$p(Y = 1|X) = \frac{1}{1 + e^{-L}} = \frac{1}{1 + e^{-(b_0 + b_1X_1 + \dots + b_4X_4)}} \quad (4)$$

where b_i ($i = 0, \dots, 4$) are the coefficients and X_i ($i = 1, \dots, 4$) are the four independent variables of the original Z'' -Model.¹⁰ The effect of this method on classification performance is assessed by testing the statistical significance of the difference between AUCs for this LR model and for the re-estimated MDA model. The resulting model is called the Z'' -Score LR model, and it is used as a benchmark for further statistical AUC comparisons because LR is applied as the principal method in testing the remaining research hypotheses.

The third hypothesis ($H3$) is associated with the performance effect of taking account of the bankruptcy year in the estimation. This hypothesis is tested by estimating an LR model based on the following logit:

$$L = b_0 + \sum_{i=1}^4 b_i X_i + \sum_{j=1}^3 c_j D_j \quad (5)$$

where b_0 is a constant, X_i ($i = 1, \dots, 4$) are the four independent variables of the original Z'' -Model, b_i ($i = 1, \dots, 4$) are their coefficients, c_j ($j = 1, \dots, 3$) are coefficients of the dummy variables, and $D_1 = 1$ when year = 2008, 0 otherwise; $D_2 = 1$ when year = 2009, 0 otherwise; $D_3 = 1$ when year = 2010, 0 otherwise.

The dummy variables do not directly refer to the bankruptcy year, which is not given in the database, but rather to the last available year before bankruptcy. For failed firms, there is an approximately 1–2-year lead time to failure from this year. In this model, the year 2007 is the base category. If the AUC of this extended LR model statistically significantly exceeds the AUC of the Z'' -Score LR model (benchmark), the evidence supports hypothesis $H3$.

Research hypotheses $H4$ – $H7$ are tested using the same approach as the third hypothesis above. However, for each hypothesis, appropriate variables are used instead of the year dummies. Hypothesis $H4$

addresses the performance effect of taking size into account, and it is tested by adding two additional variables measuring firm size to the LR model. In this LR model, size is measured by the natural logarithm of total assets and its squared form. In this way, the effect of logarithmic size can be reflected in a function following the second-order parabola. Hypothesis *H5* tests whether the classification performance improves when the age of the firm is explicitly taken into account. When testing this hypothesis, the 6–14 years category is used as the base category, and two dummy variables are incorporated in the LR model (D_1 : less than 6 years, D_2 : 15 years or more). Hypothesis *H6* looks at whether classification performance is affected by the explicit consideration of industry effects. The hypothesis is tested here using dummy variables for seven industries (D_1 : restaurants and hotels; D_2 : construction; D_3 : wholesale and retailing; D_4 : agriculture; D_5 : manufacturing; D_6 : energy and water production; D_7 : information technology), with all other industries acting as the base category.

Hypothesis *H7* tests whether the explicit consideration of the country of origin will improve classification performance. This hypothesis is tested by using country risk measures instead of dummy variables for countries. The country risk of each country is measured by Standard & Poor's Country Risk Rating per 6 months after the annual closing of accounts. The rating is numerically recoded such that the best rating, AAA, equals 1, the second-best rating, AA+, equals 2, and so on. Finally, the lowest rating, D, equals 22. Thus, *H7* is tested by estimating an LR model based on the four financial ratios of the original *Z''*-Score model and a 22-step variable referring to country risk. The five LR models with the original four financial ratios and the additional variables specified in the hypotheses are estimated for all data. In addition, an LR model including all additional variables is estimated for all data to assess the simultaneous effect of all variables. Finally, six of the seven hypotheses are tested for the data of each country separately. Hypothesis *H7* is not included in this country-level testing because the additional variable (country risk) is constant within the country.

6. Empirical Results

6.1. All Data: Coefficients of the *Z''*-Score Models

Table 2 presents descriptive statistics of the four independent variables (X_1 – X_4) of the *Z''*-Score model for all data. The variation in the ratios

Table 2. *Descriptive Statistics (All Data)*

<i>Statistic</i>	<i>WCTA</i>		<i>RETA</i>		<i>EBITTA</i>		<i>BVETD</i>	
	<i>Non-failed</i>	<i>Failed</i>	<i>Non-failed</i>	<i>Failed</i>	<i>Non-failed</i>	<i>Failed</i>	<i>Non-failed</i>	<i>Failed</i>
Median	0.152	-0.059	0.189	-0.024	0.041	-0.020	0.451	0.025
Mean	0.147	-0.213	0.188	-0.317	0.055	-0.108	3.594	0.703
Standard deviation	0.442	0.604	0.509	0.767	0.227	0.296	11.499	5.712
Upper quartile	0.420	0.142	0.476	0.087	0.131	0.042	1.548	0.215
Lower quartile	-0.040	-0.440	0.011	-0.450	-0.008	-0.208	0.100	-0.240
Maximum	0.956	0.956	0.958	0.958	0.785	0.785	68.606	68.606
Minimum	-1.637	-1.637	-2.453	-2.453	-0.828	-0.828	-0.649	-0.649

WCTA, Working Capital/Total Assets; RETA, Retained Earnings/Total Assets; EBITTA, EBIT/Total Assets; BVETD, Book Value of Equity/Total Liabilities.

is significant, as shown by the standard deviation and the quartiles. For X_1 (WCTA), X_2 (RETA), and X_3 (EBITTA), the median and the mean for non-failed firms are close to each other, indicating a symmetry of distributions. However, this is not the case for failed firms. For failed/distressed firms, the median exceeds the mean for these three ratios, indicating negatively skewed distributions. For X_4 (BVETD), the means significantly exceed the median for both failed and non-failed firms, indicating a positively skewed distribution. For each of the four variables, both the mean and the median are higher for non-failed firms, which is consistent with our expectations. The difference between the means of non-failed and failed firms is larger in the original U.S.A. data than in our all data for Retained Earnings/Total Assets (RETA) and EBIT/Total Assets (EBITTA) but is approximately the same size for Working Capital/Total Assets (WCTA) and Book Value of Equity/Total Liabilities (BVETD) (Altman, 1983). These characteristics of the data may indicate lower classification accuracy than in the original sample.

Table 3 presents the coefficients of the different models estimated for all data. All LRA estimates (Model 2 to Model 9) are statistically significant at 0.0001 due to their contributions and to the large sample size. The first column presents the coefficients of the original Z"-Score model. The "Model 1" column shows the coefficients when they are re-estimated by the same statistical method, specifically MDA. The coefficients here are negative because the models are estimated using

Table 3. *The Coefficients of the Different Models Estimated for all Data*

Variable	Z"-Score	Coefficients for different statistical models							
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Constant	3.25	-0.042	0.035	0.207	-13.466	0.007	0.048	0.049	-13.302
WCTA	6.56	-0.561	-0.495	-0.483	-0.441	-0.487	-0.540	-0.496	-0.459
RETA	3.26	-0.724	-0.862	-0.891	-1.146	-0.846	-0.859	-0.863	-1.160
EBITTA	6.72	-1.791	-1.721	-1.790	-1.619	-1.757	-1.695	-1.717	-1.682
BVETD	1.05	-0.021	-0.017	-0.016	-0.012	-0.017	-0.016	-0.017	-0.013
Year dummies									
Year 2008				-0.055					-0.034
Year 2009				-0.179					-0.150
Year 2010				-0.666					-0.631
Size variables									
Total assets (log)					1.830				1.837
Total assets squared (log)					-0.061				-0.061
Age dummies									
Less than 6 years						0.135			0.186
15 years or more						-0.058			-0.099
Country risk									
SP country rating rank								-0.003	-0.014
Industry dummies									
Restaurants and hotels							-0.653		-0.628
Construction							0.445		0.365
Wholesale and retailing							-0.112		-0.157
Agriculture							-0.180		-0.176
Manufacturing							0.139		0.095
Energy and water production							-0.454		-0.472
Information technology							-0.913		-0.915

Significance: Coefficients are all statistically significant at 0.0001.

Models: Z"-Score = Original Altman (1983) Z"-Score Model coefficients; Model 1 = The MDA model; Model 2 = The LR model; Model 3 = The LR model estimated for all data with year dummies; Model 4 = The LR model estimated for all data with size variables; Model 5 = The LR model estimated for all data with age category dummies; Model 6 = The LR model estimated for all data with industry dummies; Model 7 = The LR model estimated for all data with country risk rankings; Model 8 = The LR model estimated for all data with all variables.

$Y = 1$ for the failed firms. In our all data, EBITTA has a significantly higher relative weight than in the original U.S.A. data, while the weights of WCTA and BVETD have proportionally decreased. The re-estimated coefficient of BVETD is very small, indicating a minor effect on the logit. The “Model 2” column presents the coefficients for the Z”-Score LR model. These coefficients are directly comparable with those of the MDA model, as expected for this exceptionally large sample. For each model, the coefficient of BVETD is very close to zero. The differences in the coefficients of the original four variables among the eight LR models (Models 1–8) are small, indicating that the original four variables and the additional variables are quite independent of each other.

Table 3 also shows the coefficients of the additional variables in the LR models. The negative coefficients of the dummy (year) variables of Model 3 indicate that after 2007 (the base category), this risk of failure significantly decreased year by year. The base year of 2007 indicates that a failure emerged during 2008–2009 as a result of the global financial crisis. The crisis played a significant role in the failure of key businesses and caused a downturn in economic activity, leading to the 2008–2012 recession. The effects were especially felt in Europe. The coefficients of Model 4 for the size variables show that the contribution of size to the logit (risk measure) reaches its maximum value when logarithmic total assets are 15 or when total assets are approximately 3.3 million EUR. Model 5 confirms the riskiness of young firms because the risk of failure is very high for newly founded firms (less than 6 years old), as shown by the coefficient of the first dummy variable. The coefficients of the industry dummies in Model 6 show that construction is an exceptionally risky industry, followed by manufacturing. For Model 7, the coefficient of the country risk dummy is statistically significant (because of the large sample) but negative and very close to zero. Finally, the coefficients of all variables in Model 8 are directly comparable to those in Models 3–7.

6.2. All Data: Performance of the Z”-Score Models

Table 4 shows the AUCs in the test data for the different “all data” models by country. Model 1 refers to the original Z”-Score model. The classification performance of the score at the level of all countries is fair because $AUC = 0.743$ refers to $AR = 0.486$, which is approximately average accuracy (0.5). However, the score gives relatively good

Table 4. *Test Data AUCs for Different Countries, Based on All Data Model Versions. Comparisons are with the AUC of the LR Model Estimated for All Data (Benchmark).*

<i>Country</i>	<i>Test data AUC for different models</i>								
	<i>Benchmark</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
All data	0.748	0.743—	0.745—	0.752++++	0.760++++	0.748+++	0.751++++	0.749++++	0.771++++
Countries with estimation data									
Austria (AT)	0.800	0.788	0.797	0.805	0.818+	0.814+	0.782	0.800	0.819
Belgium (BE)	0.772	0.760	0.770	0.777	0.747	0.777	0.765	0.772	0.758
Bosnia (BA)	0.862	0.805	0.857	0.776	0.863	0.847	0.855	0.862	0.784
Bulgaria (BG)	0.684	0.630	0.680	0.654	0.691	0.680	0.659	0.684	0.632
China, ST companies	0.985	0.911—	0.983	0.958-	0.977	0.978	0.987	0.985	0.968
Colombia (CO)	0.726	0.724	0.727	0.715	0.758	0.728	0.726	0.726	0.757
Croatia (HR)	0.844	0.812	0.839	0.803	0.837	0.835	0.832	0.844	0.801
Czech Republic (CZ)	0.811	0.813	0.811	0.819	0.828	0.807	0.820	0.811	0.838
Denmark (DK)	0.803	0.798	0.800	0.781	0.813	0.802	0.801	0.803	0.796
Estonia (EE)	0.823	0.827	0.823	0.847	0.866	0.826	0.833	0.823	0.890
Finland (FI)	0.867	0.864	0.866	0.835	0.862	0.870	0.878	0.867	0.853
France (FR)	0.739	0.723	0.735	0.749	0.771	0.741	0.762	0.739	0.799
Germany (DE)	0.673	0.658	0.666	0.695	0.656	0.684	0.677	0.673	0.688
Hungary (HU)	0.742	0.746	0.740	0.660	0.738	0.755	0.735	0.742	0.696
Iceland (IS)	0.664	0.674	0.666	0.694	0.678	0.673	0.672	0.664	0.716
Ireland (IE)	0.679	0.672	0.676	0.708	0.677	0.681	0.688	0.679	0.712
Italy (IT)	0.806	0.799	0.804	0.833	0.835	0.806	0.799	0.806	0.849
Latvia (LV)	0.678	0.691	0.678	0.704	0.676	0.686	0.698	0.678	0.724
Netherlands (NL)	0.752	0.754	0.750	0.775	0.769	0.754	0.746	0.752	0.787
Norway (NO)	0.716	0.694	0.713	0.658	0.682	0.720	0.715	0.716	0.645
Poland (PL)	0.903	0.904	0.904	0.908	0.902	0.903	0.899	0.903	0.904
Portugal (PT)	0.741	0.724	0.736	0.749	0.773	0.738	0.755	0.741	0.785
Romania (RO)	0.758	0.740	0.754	0.709	0.749	0.755	0.748	0.758	0.703
Russian Federation (RU)	0.811	0.802	0.812	0.843	0.799	0.807	0.799	0.811	0.814

Table 4 (Continued)

Country	Test data AUC for different models								
	Benchmark	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Slovakia (SK)	0.777	0.774	0.776	0.780	0.811	0.769	0.786	0.777	0.808
Slovenia (SI)	0.737	0.725	0.733	0.674	0.740	0.747	0.718	0.737	0.721
Spain (ES)	0.734	0.713	0.732	0.707	0.793	0.728	0.753	0.734	0.774
Sweden (SE)	0.813	0.801	0.809	0.799	0.784	0.817	0.823	0.814	0.800
Ukraine (UA)	0.708	0.714	0.710	0.715	0.721	0.708	0.702	0.708	0.722
United Kingdom (GB)	0.699	0.719	0.699	0.686	0.736	0.695	0.706	0.699	0.729
United States (US)	0.710	0.701	0.711	0.709	0.722	0.705	0.716	0.710	0.723
Countries only in test data									
European									
Greece (GR)	0.715	0.670	0.702	0.725	0.711	0.713	0.717	0.715	0.718
Lithuania (LT)	0.767	0.782	0.767	0.764	0.768	0.769	0.775	0.767	0.778
Serbia (RS)	0.736	0.713	0.730	0.603-	0.826	0.720	0.753	0.736	0.738
U.K., liquidation dataset	0.606	0.621	0.603	0.620	0.618	0.610	0.607	0.607	0.635
Non-European									
China (CN)	0.558	0.570	0.557	0.572	0.543	0.554	0.567	0.558	0.556
China, delisted firms, DL	0.529	0.546	0.519	0.563	0.740++++	0.542	0.520	0.529	0.707+++

Significance: AUC better than benchmark: 0.0001 = +++, 0.001 = ++, 0.01 = +, 0.1 = +

AUC worse than benchmark: 0.0001 = —, 0.001 = —, 0.01 = —, 0.1 = -

Models: Benchmark = The LR model estimated for all data with Z"-model (1983) variables; Model 1 = The original Altman (1983) Z"-Score Model; Model 2 = The MDA model estimated for all data; Model 3 = The LR model estimated for all data with year dummies; Model 4 = The LR model estimated for all data with size variables; Model 5 = The LR model estimated for all data with age category dummies; Model 6 = The LR model estimated for all data with industry dummies; Model 7 = The LR model estimated for all data with country risk rankings; Model 8 = The LR model estimated for all data with all variables.

Table 5. *Differences of Medians Between Non-Failed and Failed Groups*

<i>Country</i>	<i>WCTA</i>	<i>RETA</i>	<i>EBITTA</i>	<i>BVETD</i>	<i>AUC of Z''-Score</i>
Austria (AT)	0.448	0.405	0.126	0.487	0.788
Belgium (BE)	0.223	0.264	0.077	0.431	0.760
Bosnia (BA)	0.106	0.249	0.088	0.580	0.805
Bulgaria (BG)	0.114	0.291	0.094	0.436	0.630
China (CN)	0.068	0.032	0.016	0.280	0.570
China, delisted data, DL	0.089	-0.061	-0.032	0.083	0.546
China, ST data	0.298	0.293	0.139	0.468	0.911
Colombia (CO)	0.226	0.235	0.099	0.705	0.724
Croatia (HR)	0.275	0.335	0.044	0.274	0.812
Czech Republic (CZ)	0.404	0.397	0.069	0.667	0.813
Denmark (DK)	0.267	0.356	0.046	0.733	0.798
Estonia (EE)	0.331	0.388	0.113	1.033	0.827
Finland (FI)	0.402	0.606	0.207	0.907	0.864
France (FR)	0.140	0.213	0.065	0.424	0.723
Germany (DE)	0.131	0.136	0.032	0.262	0.658
Greece (GR)	0.171	0.262	0.049	0.349	0.670
Hungary (HU)	0.175	0.224	0.052	0.587	0.746
Iceland (IS)	0.246	0.261	0.051	0.337	0.674
Ireland (IE)	0.181	0.266	0.039	0.560	0.672
Italy (IT)	0.277	0.164	0.073	0.207	0.799
Latvia (LV)	0.117	0.120	0.042	0.254	0.691
Lithuania (LT)	0.246	0.218	0.051	0.569	0.782
Netherlands (NL)	0.204	0.253	0.077	0.432	0.754
Norway (NO)	0.157	0.219	0.115	0.329	0.694
Poland (PL)	1.340	0.920	0.124	1.351	0.904
Portugal (PT)	0.215	0.200	0.052	0.318	0.724
Romania (RO)	0.222	0.271	0.056	0.298	0.740
Russian Federation (RU)	0.350	0.242	0.069	0.245	0.802
Serbia (RS)	0.120	0.148	0.045	0.389	0.713
Slovakia (SK)	0.256	0.184	0.061	0.431	0.774
Slovenia (SI)	0.111	0.172	0.035	0.326	0.725
Spain (ES)	0.143	0.143	0.076	0.285	0.713
Sweden (SE)	0.255	0.346	0.099	0.663	0.801
Ukraine (UA)	0.204	0.200	0.031	0.449	0.714
United Kingdom (GB)	0.211	0.245	0.033	0.472	0.719
U.K., liquidation dataset	0.156	0.234	0.031	0.447	0.621
United States (US)	0.195	0.378	0.248	0.722	0.701
Average of column items	0.245	0.265	0.073	0.481	0.740
Correlation with Z''-Score AUC	0.611	0.681	0.516	0.574	1.000

WCTA, Working Capital/Total Assets; RETA, Retained Earnings/Total Assets; EBITTA, EBIT/Total Assets; BVETD, Book Value of Equity/Total Liabilities; SALTA, Sales/Total Assets; AUC, Area under the ROC curve; Z''-Score, Altman (1983) Z''-Score in the test data.

results ($AUC > 0.8$) for China (ST firms), Poland, Finland, Estonia, the Czech Republic, Croatia, Bosnia, Russia, and Sweden. Its performance is quite low ($AUC < 0.7$) for Norway, Latvia, Iceland, Ireland, and Germany. The lower part of the table shows the AUCs for the countries included only in the test data. The performance of the score is very low in the Chinese CN (primarily private) and DL (delisted) samples and for liquidation firms in the United Kingdom.

The Appendix shows the medians of the four ratios (X_1 – X_4) by status and country. Table 5 presents the differences of these medians between non-failed and failed firms by country. This table also presents the AUC of the Z ’-Score and its correlation with the difference of medians, which is high for each financial ratio, showing that the effects of the ratios on AUC are well balanced. For China’s ST firms, the differences are not exceptionally large, except for EBITTA, which implies, with the exceptionally high AUC, that ST firms systematically differ from non-ST firms, although the differences are not extremely large. The differences between the medians are very large in Poland for each ratio, justifying the high AUC, and in Finland and the Czech Republic, where the difference in EBITTA is average. In Germany, Latvia, China (CN and delisted), and the U.K. (liquidation), the differences in all four ratios are below average, which is obviously associated with a low AUC. In the sample of Chinese delisted firms, the differences in RETA and EBITTA are even negative. In Iceland and Ireland, the differences only in EBITTA are exceptionally small.

Model 2 in Table 4 is the re-estimated Z ’-Score model, where the coefficients are estimated by MDA for all data. Its AUC (0.745) is only slightly higher than that for the original model (0.743), supporting $H1$ only very weakly, if at all. The classification accuracy in terms of AR (0.490) is at approximately the average level. The re-estimation of the coefficients has led to improved classification accuracy in a number of countries, especially Bosnia, China (ST), Norway, and Greece. However, it has impaired the classification accuracy in the United Kingdom and China (delisted). The “Benchmark” column reports the results for the benchmark model (Z ’-Score LR model), showing the effect of the estimation method. For the benchmark model, the AUC in all data is 0.748, which is higher than that for Models 1 and 2. The differences among AUCs are very small, only weakly supporting $H2$ (estimation method). The LR model (benchmark) and the MDA model (Model 2) give nearly identical AUCs for each country. This result was expected because the coefficients of the models are directly compa-

table. The similar results for the models may also indicate that the independent variables conform to multinormality. Nevertheless, these similarities support what most researchers in the field of default classification models have concluded: that the accuracy levels of MDA and logistic regression models are extremely similar.

Model 3 (LR model with year dummies) leads in all test data to a higher AUC (0.752) than the benchmark model, supporting *H3* (bankruptcy year effect). However, the AUC effects are not positive for all countries. The effects are positive, for example, for Russia, Estonia, Germany, Ireland, and Latvia, but these effects are not statistically significant. There are statistically significant negative effects for China (ST) and Serbia. There are notable negative effects, especially for Bosnia, Croatia, Hungary, Norway, and Slovenia. These diverse results are due to the exceptional annual distributions of failed firms in these countries. For the countries with negative effects, the percent of failed firms from 2010 ($D_3 = 1$) exceeds 50 per cent, while for the countries with positive effects, it is only a few percent. For each group, non-failed firms are quite equally distributed over years. When the coefficient of D_3 is very low (-0.666), it strongly decreases the risk estimates of most failed firms in the former countries but of only a few failed firms in the latter countries, which leads to the observed effects. *H3* is supported by evidence at the level of the whole sample. However, in some country samples (at the individual country level), *H3* is not supported.

Model 4 (LR model with size variables) performs better than the benchmark model, which lends support to *H4* (size effect) and leads to $AUC = 0.760$, indicating $AR = 0.520$, and to significant improvements in the AUC for, e.g., China (delisted) and Austria. For China (delisted), the increase in AUC is extremely strong, and the AUC also improves for, e.g., Estonia, Italy, Slovakia, Spain, and the U.K. Model 4 also led to lower AUCs in a few countries, but this decrease is not significant. Model 4 is based on the four original variables and the size effect following a second-order parabola. This kind of size effect is very small for micro firms but increases when approaching its maximum value in middle-sized firms. The countries with a positive change in AUC typically have data in which the percent of failed micro firms (in all failed firms) is relatively low (40–60 per cent), while there are many middle-sized failed firms. Because the size effect is strongest for middle-sized firms, the AUC increases. In contrast, the countries with

a negative change in AUC have data in which the percentage of failed micro firms is exceptionally high (70–80 per cent).

Model 5 (LR model with age category dummies) gives, for all test data, nearly the same AUC as the benchmark model (AUC = 0.748). However, the difference is positive and statistically significant, giving at least marginal support to *H5* (age effect). For nearly all countries, the effect of age on AUC is small. For Austria, however, this effect is positive and significant. For Austria, the percentage of young firms (less than 6 years) among non-failed firms is only approximately 10 per cent, whereas this percentage among failed firms is more than 20 per cent. Because Model 5 includes a strong positive age risk effect for young firms (D_2), it increases the risk of many failed firms but of only a few non-failed firms, which obviously leads to an improvement in AUC.

Model 6 (LR model with industry dummies) outperforms the benchmark model in AUC, supporting *H6* (industry effect). It gives an AUC = 0.751, indicating an AR = 0.502. However, its AUC is notably higher than the benchmark AUC in only a few countries, such as France, Latvia, Portugal, and Spain. Model 6 has a negative effect on failure risk for, e.g., restaurants, hotels and the information technology industry, but it has a positive effect on the construction and manufacturing industries. For countries with a positive effect on AUC, the percent of non-failed firms in restaurants, hotels and information technology is high, while that of failed firms is low. For risky industries (construction and manufacturing), these distributions are reversed. Thus, Model 6 gives a positive (negative) risk effect for many failed (non-failed) firms and a negative (positive) risk effect for only a few failed (non-failed) firms. Therefore, the AUC increases. This situation is reversed for the countries with a negative effect on AUC (Austria and Slovenia). The samples of these countries include a high percentage of non-failed firms in the manufacturing industry, leading to a decrease in AUC.

Model 7 (LR model with the country risk measure) leads to a marginally higher classification performance (AUC = 0.749) than the benchmark model. This result gives only very weak support for *H7* (country of origin effect). However, for each country, the resultant AUC is nearly identical to that given by the benchmark model. This result was expected due to the negligible coefficient (−0.003) of the country risk measure (SP country rating rank) in Model 7. This result

implies that country risk has no effect on the boundary between bankrupt and non-bankrupt firms.

Model 8 (LR model with all variables) includes the four financial ratios and all additional variables and leads to a sizeable increase in AUC (AUC = 0.771) compared to the benchmark AUC in all test data. However, the effect on the AUCs largely varies and is either negative or positive in different countries. The positive effect is large in several countries, such as Estonia, France, Iceland, Italy, Latvia, and China (delisted). However, it also has a negative effect on AUCs in several countries, such as Bosnia, Hungary, and Norway. These results show that the inclusion of additional variables in the original model will usually increase the AUC, but not in every country.

The “all data” benchmark also performs fairly well for the United States and Colombian samples (with the U.S.A. firms, unlike the majority of other firms in this study, being listed or delisted companies). The poor performance of the predominantly private (CN) and delisted (DL) Chinese firm samples is associated with very small differences between the medians of the non-failed and failed groups, as shown in Table 5. It is clear that the “delisted” status is not comparable with “bankruptcy” status. When the status is defined as “ST”, the predictability of Chinese listed firms is very high. Prior studies based on Chinese ST firms have also demonstrated good predictability (Wang and Campbell, 2010; Zhang et al., 2010). Nevertheless, this puzzle calls for additional research and modeling work regarding unlisted and delisted Chinese firms.

6.3. Country-Level Data: Performance of the Z"-Score Models

The heterogeneity of the firms and their distributions in “all data” make it difficult for a uniform all data model to increase AUCs across all countries. Table 6 presents the test data AUCs for the different models estimated for each country separately (country-level models). In this table, the “all data” Z"-Score LR model acts as the benchmark. When the models are estimated from country data, this benchmark is clearly outperformed by the resulting MDA (Model 1) and LR (Model 2) models in only a few countries (Bulgaria, France, Latvia, Spain, and Sweden). However, these results give only weak support for *H1* at the country level because the effects are not significant. In addition, the benchmark leads to higher AUCs than in Models 1 and 2, at least in Austria, Bosnia, Ireland, Slovenia, and the United States. The dif-

Table 6. *Test Data AUCs for Different Estimated Country Models. Comparisons are With the AUC of the LR Model Estimated for All Data (Benchmark)*

Country	Test data AUC for different models							
	Benchmark	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Austria (AT)	0.800	0.782	0.770-	0.774	0.829	0.787	0.707-	0.764
Belgium (BE)	0.772	0.779	0.780	0.826	0.776	0.783	0.781	0.834
Bosnia (BA)	0.862	0.850	0.832	0.833	0.838	0.838	0.820	0.853
Bulgaria (BG)	0.684	0.785	0.785	0.785	0.796	0.794	0.677	0.707
China, ST companies	0.985	0.984	0.982	0.980	0.986	0.986	0.986	0.989
Colombia (CO)	0.726	0.755	0.754	0.818+	0.789	0.749	0.774	0.824+
Croatia (HR)	0.844	0.862	0.858	0.865	0.853	0.863	0.847	0.863
Czech Republic (CZ)	0.811	0.812	0.812	0.823	0.830	0.813	0.818	0.842
Denmark (DK)	0.803	0.806	0.809	0.833	0.818	0.804	0.813	0.843
Estonia (EE)	0.823	0.824	0.839	0.866	0.874	0.839	0.847	0.899
Finland (FI)	0.867	0.867	0.870	0.885	0.868	0.873	0.879	0.894
France (FR)	0.739	0.773	0.799	0.805	0.826	0.800	0.810	0.845
Germany (DE)	0.673	0.684	0.685	0.734	0.704	0.701	0.690	0.762
Hungary (HU)	0.742	0.736	0.743	0.788	0.767	0.765	0.747	0.820
Iceland (IS)	0.664	0.670	0.671	0.784+	0.683	0.714	0.708	0.824+
Ireland (IE)	0.679	0.663	0.666	0.718	0.661	0.665	0.680	0.724
Italy (IT)	0.806	0.802	0.810	0.835	0.839	0.809	0.816	0.868
Latvia (LV)	0.678	0.690	0.707	0.745	0.720	0.711	0.730	0.771
Netherlands (NL)	0.752	0.752	0.756	0.768	0.784	0.760	0.759	0.807
Norway (NO)	0.716	0.741	0.741	0.803	0.749	0.744	0.743	0.814
Poland (PL)	0.903	0.891	0.897	0.915	0.899	0.896	0.895	0.913
Portugal (PT)	0.741	0.753	0.757	0.761	0.780	0.758	0.765	0.797
Romania (RO)	0.758	0.718	0.773	0.805	0.757	0.755	0.753	0.774
Russian Federation (RU)	0.811	0.808	0.810	0.854	0.811	0.811	0.818	0.862
Slovakia (SK)	0.777	0.773	0.775	0.782	0.810	0.761	0.773	0.807
Slovenia (SI)	0.737	0.703	0.719	0.704	0.711	0.739	0.686	0.698
Spain (ES)	0.734	0.755	0.767	0.768	0.849	0.766	0.776	0.858

Table 6 (Continued)

<i>Country</i>	<i>Test data AUC for different models</i>							
	<i>Benchmark</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>
Sweden (SE)	0.813	0.826	0.829	0.843	0.831	0.831	0.892	0.901
Ukraine (UA)	0.708	0.712	0.712	0.720	0.742	0.718	0.718	0.758
United Kingdom (GB)	0.699	0.708	0.713	0.718	0.764	0.714	0.731	0.785
United States (US)	0.710	0.689	0.687	0.686	0.816+	0.689	0.714	0.816+
Average of AUC	0.768	0.773	0.778	0.801	0.799	0.782	0.779	0.823

Significance: AUC better than benchmark: 0.0001 = +++, 0.001 = ++, 0.01 = +, 0.1 = +; AUC worse than benchmark: 0.0001 = —, 0.001 = —, 0.01 = —, 0.1 = —.

Models: Benchmark = The LR model estimated for all data with Z"-model (1983) variables; Model 1 = The MDA model estimated for country data; Model 2 = The LR model estimated for country data; Model 3 = The LR model estimated for country data with year dummies; Model 4 = The LR model estimated for country data with size variables; Model 5 = The LR model estimated for country data with age category dummies; Model 6 = The LR model estimated for country data with industry dummies; Model 7 = The LR model estimated for country data with all variables.

ferences in AUCs given by Models 1 and 2 are generally small. Model 1 is clearly outperformed by Model 2 in Romania only. Thus, country-level evidence does not support *H2* (estimation method).

Model 3 (LR model with year dummies) leads in most countries to a clearly higher AUC than the benchmark model. This evidence gives support to *H3* (bankruptcy year effect). Model 3 leads to a lower AUC than the benchmark model in Austria, Bosnia, Slovenia, and the United States. Model 4 (LR model with size variables) leads to improved performance in nearly every country, supporting *H4*. This improvement is significant, however, only in the United States, where the AUC increases to 0.816 in Model 4, in contrast to the benchmark model, for which it is only 0.710. This improvement is also notable in Bulgaria, France, Latvia, Spain, and the United Kingdom. Model 5 (LR model with age category dummies) gives higher AUCs than the benchmark model for several countries, but none of the improvements are significant. The positive effect is particularly strong in Bulgaria, France, and Iceland. Although there are also negative effects on AUC, this evidence only weakly supports *H5* because these negative effects are relatively small.

Model 6 (LR model with industry dummies) shows both negative and positive effects on AUCs when compared with the benchmark. However, the only significant effect is the negative effect found in Austria. In Bulgaria and Slovenia, the AUC notably decreases due to the industry dummies. However, there are notable positive effects on the AUC in, for example, France, Iceland, Latvia, and Sweden. Thus, the effect is not systematic and gives only weak support to *H6*. Model 7 (LR model with all variables) leads to a remarkable increase in AUC compared with the benchmark model in Colombia, Iceland, and the United States and to notable improvements in AUC in Belgium, Denmark, Estonia, France, Germany, Hungary, Latvia, Norway, Spain, and the United Kingdom. Negative effects on AUC are found only in Austria and Slovenia. Thus, classification performance of the *Z*'-Score model with "all test" data remarkably increases in most countries when different effects are taken into account by additional variables. This increase is found in most European countries and in Colombia and the United States. In China, the AUC for the ST sample is extremely high for the *Z*'-Score LR model, and it can be improved only slightly by additional variables.

7. Summary of the Study and a Suggested Extension

The purpose of this study was to assess the classification performance of the Z'' -Score model originally introduced by Altman (1983) using a very large international dataset. We test how the original version of the Z'' -Score model performs in different countries and how re-estimations using another statistical method and different additional variables affect the classification performance when the data are very heterogeneous. For this kind of testing, seven research hypotheses on classification performance are formulated. These hypotheses are tested for all data and separately for country data (country-level analysis). The estimation data are from 31 countries, and the results are validated for 34 countries. The countries are mainly from Europe, but three non-European countries are included (China, Colombia, and the US). The statuses used in the classification are mainly bankruptcy/active, but receivership firms are also considered to have failed. In the Chinese data, ST (special treatment) and delisted firms are also separately analyzed as failed firms.

The analyses for all data show that the original Z'' -Score model performs very satisfactorily in an international context. The effects of the four financial ratios on performance are well balanced, although Book Value of Equity/Total Liabilities (BVETD) showed a very small contribution in re-estimation. The original model performs very well in several countries, such as Poland, Finland, and China (ST firms). The re-estimation of the coefficients using MDA only marginally improved the classification performance, thus weakly supporting the obsolescence hypothesis ($H1$) or, put differently, showing that the original coefficients are extremely robust across countries and over time (opposite to, e.g., Grice and Ingram, 2001). This same conclusion holds for the re-estimation of the model using LRA because the performance results are very similar to those of MDA ($H2$). The use of additional variables in the model generally improves the classification accuracy of the original model, but the results for countries are dependent on the distribution of failed and non-failed firms. When the coefficients are estimated for all data, the effects on performance in a country depend on how the distributions in that country correspond to the distributions in all data. For all sets of additional variables, the performance is generally improved, but the improvement is not strong and the effects vary by country. Thus, the evidence gives weak support for the effects of all additional variables. For the effects of bankruptcy year ($H3$) and size

(*H4*), the effects are stronger, but the variations in the effects between countries are also stronger. The effects of age (*H5*), industry (*H6*), and country (*H7*) are marginal. When all additional variables are included in the same model, the performance generally significantly increases, but at the same time, the variations among countries become stronger.

In summary, our evidence indicates that the original *Z''*-Score model performs well in an international context. It is, however, possible to extract a more efficient country model for most European countries and for non-European countries using the four original variables accompanied by a set of additional background variables. Considering practical applications, it is obvious that while a general international model works reasonably well, for most countries, the classification accuracy may be somewhat improved with country-specific estimation (a conclusion similar to Xu and Zhang, 2009). In a country model, the information provided even by simple additional variables may help boost the classification accuracy to a much higher level.

In finance and accounting research, failure prediction models may be utilized as risk measures in many different contexts. Where failure prediction modeling is not the primary focus, it would be time-consuming, uneconomical, and superfluous to first estimate a failure prediction model (or models) and then study the phenomenon of interest. In such instances, a well-tested general model that works reliably and consistently across different countries is highly desirable. Based on our empirical tests in this study, the original *Z''*-Score model and its re-estimated version, containing the four Altman (1983) study variables with coefficients re-estimated using a large dataset, work consistently well internationally and are easy to implement and interpret. Thus, this kind of accounting-based model can be used by all interested parties, especially internationally active banks or other financial institutions, not only for failure or distress prediction but also for other managerial purposes such as provisioning and economic capital calculation. Internationally active banks need to develop a universal tool that can be applied in all subsidiaries and branches to control risk across the whole banking group.

Further research should focus on other modifications and extensions than those presented in our paper, such as using alternative modeling techniques (e.g., panel data analysis), introducing new variables (e.g., macroeconomic data), and testing its usefulness with data from other countries (e.g., emerging markets).

Notes

1. See Altman and Saunders (1997) for a review of research over this 20 year period.
2. Dichev (1998) compares the Altman Z-score and Ohlson O-score approaches.
3. Grice and Dugan (2003) present a re-estimation of Ohlson's and Zmijewski's models.
4. We use bankruptcy, failure, default and financial distress as equivalents.
5. Research devoted to the application of the Z-Score model before 2000 was reviewed by Grice and Ingram (2001).
6. Most of the models focused on stock-exchange-listed firms; thus, the Z'-Score and Z''-Score models were not used.
7. See Zhang et al. (2010) for the rationale for using special-treatment firms as a proxy for bankruptcies. These are firms put on probation by the stock exchange for poor operating performance and/or negative equity.
8. This is done because the results about predictability were also good for such a small sample.
9. These firms are included only in the test data because the predictability of failure was exceptionally poor.
10. From the weighting procedure, it follows that the score (cut-off-value) that best separates failures from non-failures is 0.50 (or, alternatively, 50 per cent). Although the score (logit) in principle has a probability interpretation, the "probabilities" estimated using this weighting scheme in this study do not, however, represent empirical PD's. It would still require calibration procedures for the models to obtain PD's that correspond to associated empirical PD's in the population. But this is not attempted in the study, as our focus is more general (the classification accuracies of the models across countries). It is also worth noting that the original Z''-Score does not have a PD interpretation either.

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Appendix. Medians of the Altman (1983) model (Z') variables by status and country.

Country	<i>Non-failed</i> <i>Failed</i>		<i>Non-failed</i> <i>Failed</i>		<i>Non-failed</i> <i>Failed</i>		<i>Non-failed</i> <i>Failed</i>	
	<i>WCTA</i>		<i>RETA</i>		<i>EBITTA</i>		<i>BVETD</i>	
Austria (AT)	0.170	−0.278	0.260	−0.145	0.055	−0.071	0.465	−0.022
Belgium (BE)	0.136	−0.087	0.157	−0.107	0.052	−0.025	0.460	0.029
Bosnia (BA)	0.087	−0.019	0.148	−0.101	0.032	−0.056	0.580	0.000
Bulgaria (BG)	0.216	0.102	0.272	−0.019	0.075	−0.019	0.504	0.068
China (CN)	0.105	0.037	0.064	0.032	0.064	0.048	0.870	0.590
China, delisted data, DL	0.158	0.069	0.286	0.347	0.059	0.091	0.923	0.840
China, ST data	0.106	−0.192	0.281	−0.012	0.052	−0.087	0.776	0.308
Colombia (CO)	0.244	0.018	0.282	0.047	0.104	0.005	0.940	0.235
Croatia (HR)	0.093	−0.182	0.130	−0.205	0.030	−0.014	0.274	0.000

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Appendix (Continued)

Country	<i>Non- failed</i> <i>Failed</i>		<i>Non- failed</i> <i>Failed</i>		<i>Non- failed</i> <i>Failed</i>		<i>Non- failed</i> <i>Failed</i>	
	<i>WCTA</i>		<i>RETA</i>		<i>EBITTA</i>		<i>BVETD</i>	
Czech Republic (CZ)	0.196	-0.208	0.230	-0.167	0.050	-0.019	0.591	-0.076
Denmark (DK)	0.128	-0.139	0.306	-0.050	0.005	-0.041	0.758	0.025
Estonia (EE)	0.222	-0.109	0.455	0.067	0.050	-0.063	1.169	0.136
Finland (FI)	0.233	-0.169	0.359	-0.247	0.082	-0.125	0.744	-0.163
France (FR)	0.146	0.006	0.223	0.010	0.059	-0.006	0.501	0.077
Germany (DE)	0.307	0.176	0.150	0.014	0.069	0.037	0.335	0.073
Greece (GR)	0.127	-0.044	0.049	-0.213	0.039	-0.010	0.460	0.111
Hungary (HU)	0.135	-0.040	0.271	0.047	0.054	0.002	0.717	0.130
Iceland (IS)	0.051	-0.195	0.046	-0.215	0.051	0.000	0.196	-0.141
Ireland (IE)	0.198	0.017	0.383	0.117	0.029	-0.010	0.728	0.168
Italy (IT)	0.107	-0.170	0.077	-0.087	0.032	-0.041	0.178	-0.029
Latvia (LV)	0.102	-0.015	0.150	0.030	0.069	0.027	0.342	0.088
Lithuania (LT)	0.205	-0.041	0.273	0.055	0.054	0.003	0.686	0.117
Netherlands (NL)	0.204	0.000	0.303	0.050	0.065	-0.012	0.511	0.079
Norway (NO)	0.185	0.028	0.139	-0.080	0.068	-0.047	0.398	0.069
Poland (PL)	0.198	-1.142	0.258	-0.662	0.076	-0.048	0.850	-0.501
Portugal (PT)	0.164	-0.051	0.133	-0.067	0.028	-0.024	0.343	0.025
Romania (RO)	0.071	-0.151	0.158	-0.113	0.041	-0.015	0.250	-0.048
Russian Federation (RU)	0.088	-0.262	0.106	-0.136	0.043	-0.026	0.194	-0.051
Serbia (RS)	0.093	-0.027	0.129	-0.019	0.027	-0.018	0.389	0.000
Slovakia (SK)	0.137	-0.119	0.185	0.001	0.060	-0.001	0.496	0.065
Slovenia (SI)	0.109	-0.002	0.215	0.043	0.039	0.004	0.434	0.108
Spain (ES)	0.117	-0.026	0.139	-0.004	0.029	-0.047	0.336	0.051
Sweden (SE)	0.266	0.011	0.357	0.011	0.058	-0.041	0.749	0.086
Ukraine (UA)	0.053	-0.151	0.034	-0.166	0.003	-0.028	0.442	-0.007
United Kingdom (GB)	0.179	-0.032	0.294	0.049	0.031	-0.002	0.579	0.107
U.K., liquidation dataset	0.179	0.023	0.294	0.060	0.031	0.000	0.579	0.132
United States (US)	0.164	-0.031	0.374	-0.004	0.003	-0.245	0.800	0.078
Average of medians ^a	0.153	-0.092	0.213	-0.050	0.048	-0.025	0.555	0.075

WCTA, Working Capital/Total Assets; RETA, Retained Earnings/Total Assets; EBITTA, EBIT/Total assets; BVETD, Book Value of Equity/Total Liabilities.

^aBecause the two datasets for non-failed U.K. firms are identical, the non-failed medians are used only once in the calculation of the averages.

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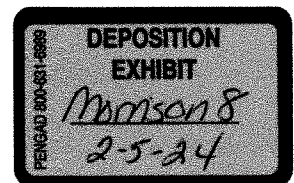
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Research Paper

A fifty-year retrospective on credit risk models, the Altman Z-score family of models and their applications to financial markets and managerial strategies

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ABSTRACT

Fifty years ago, in 1967, I completed my PhD dissertation, which involved the first multivariate model for predicting the financial health of US manufacturing firms and whether or not they were likely to file for bankruptcy. That work was followed shortly afterward (in 1968) by the publication of the model's specifications. Despite its "old age", the Altman Z-score is still the standard against which most other bankruptcy or default prediction models are measured and is clearly the most used by financial market practitioners and academic scholars for a variety of purposes. The objective of this paper is to reflect upon the evolution of the Altman family of bankruptcy prediction models, as well as their extensions and multiple applications in financial markets and managerial decision making.

Keywords: Altman Z-score; bankruptcy prediction; credit risk; probability of default (PD); equity investment strategy; bond strategies.

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1 THE EVOLUTION OF CORPORATE CREDIT-SCORING SYSTEMS

Credit scoring systems for identifying the determinants of a firm's repayment likelihood probably go back to the days of the Crusades, when travelers needed "loans" to finance their travels. They were certainly used much later in the United States as companies and entrepreneurs helped to grow the economy, especially in its westward expansion. Primitive financial information was usually evaluated by lending institutions in the 1800s, with the primary types of information required being subjective or qualitative in nature, revolving around ownership and management variables as well as collateral (see Box 1). It was not until the early 1900s that rating agencies and some more financially oriented corporate entities (eg, the DuPont system of corporate ROE growth) introduced univariate accounting measures and industry peer group comparisons with rating designations (see Figure 1). The key aspect of these "revolutionary" techniques was that they enabled the analyst to compare an individual corporate entity's financial performance metrics to a reference database of time series (same entity) and cross-section (industry) data. Then, and even more so today, data and databases were the key elements of meaningful diagnostics. There is no doubt that in the credit-scoring field, data is "king" and models for capturing the probability of default (PD) ultimately succeed, or not, based on whether they can be applied to databases of various sizes and relevance.

The original Altman Z-score model (Altman 1968) was based on a sample of sixty-six manufacturing companies in two groups, bankrupt and nonbankrupt firms, and a holdout sample of fifty companies. In those "primitive" days, there were no electronic databases and the researcher/analyst had to construct their own database from primary (annual report) or secondary (Moody's and Standard & Poor's (S&P) industrial manuals and reports) sources. To this day, instructors and researchers oftentimes ask me for my original sixty-six-firm database, mainly for instructional or reference exercises. It is not unheard of today for researchers to have access to databases of thousands, even millions, of firms (especially in countries where all firms must file their financial statements in a public database, eg, in the United Kingdom). To illustrate the importance of databases, Moody's purchased extensive data on 200 million firms and customer access from Bureau van Dijk Electronic Publishing (EQT) for US\$3.3 billion in 2017, while S&P purchased SNL Financial's extensive database, management structure and customer book for US\$2.2 billion in 2015. As indicated in Figure 1, the three major rating agencies established a hierarchy of creditworthiness that was descriptive, but not quantified, in its depiction of the likelihood of default. The determination of these ratings was based on a combination of (1) financial statement ratio analytics, usually on a univariate, one-ratio-at-a-time basis; (2) industry health discussions; and (3) qualitative factors evaluating the firm's management plans and capabilities, strategic directions and other, perhaps

BOX 1 Corporate scoring systems over time. [Box continues on next page.]

-
- Qualitative (subjective) – 1800s
 - Univariate (accounting/market measures):
 - rating agency (eg, Moody's (1909), Standard & Poor's (1916)) and corporate (eg, DuPont) systems (early 1900s)
 - Multivariate (accounting with market measures) – late 1960s (Z-score) to the present:
 - discriminant, logit, probit models (linear, quadratic)
 - nonlinear and “black box” models (eg, recursive partitioning (Frydman *et al* 1985), neural networks (1990s))
 - Discriminant and logit models used for:
 - consumer models – Fair–Isaac (FICO scores)
 - manufacturing public (US) firms (1968) – Z-scores
 - extensions and innovations for specific industries and countries (1970s to the present)
 - ZETA score – industrials (1977)
 - private firm models (eg, Z' -score (1983), Z'' -score (1995b))
 - EM score – emerging markets (1995b)
 - bank specialized systems (1990s), Basel II impetus
 - small and medium-sized enterprises, eg, Edmister (1972), Altman and Sabato (2007) and Wisefunding Ltd (2016; www.wisefunding.com)
 - Option/contingent claims models (1970s to the present):
 - risk of ruin (Wilcox 1971)
 - KMV's credit monitor system model (1993) – extensions of Merton (1974) structural framework
 - Artificial intelligence systems (1990s to the present):
 - expert systems
 - neural networks
 - machine learning
-

“inside”, information gleaned from interviews with senior management and experience of the team that was assigned to the rating decision. To this day, the decision process of rating agencies remains essentially the same, with the ultimate rating decision being made based on the firm's likelihood of default or, in some cases, the loss given default (LGD) based on expected recovery. These inputs were analyzed

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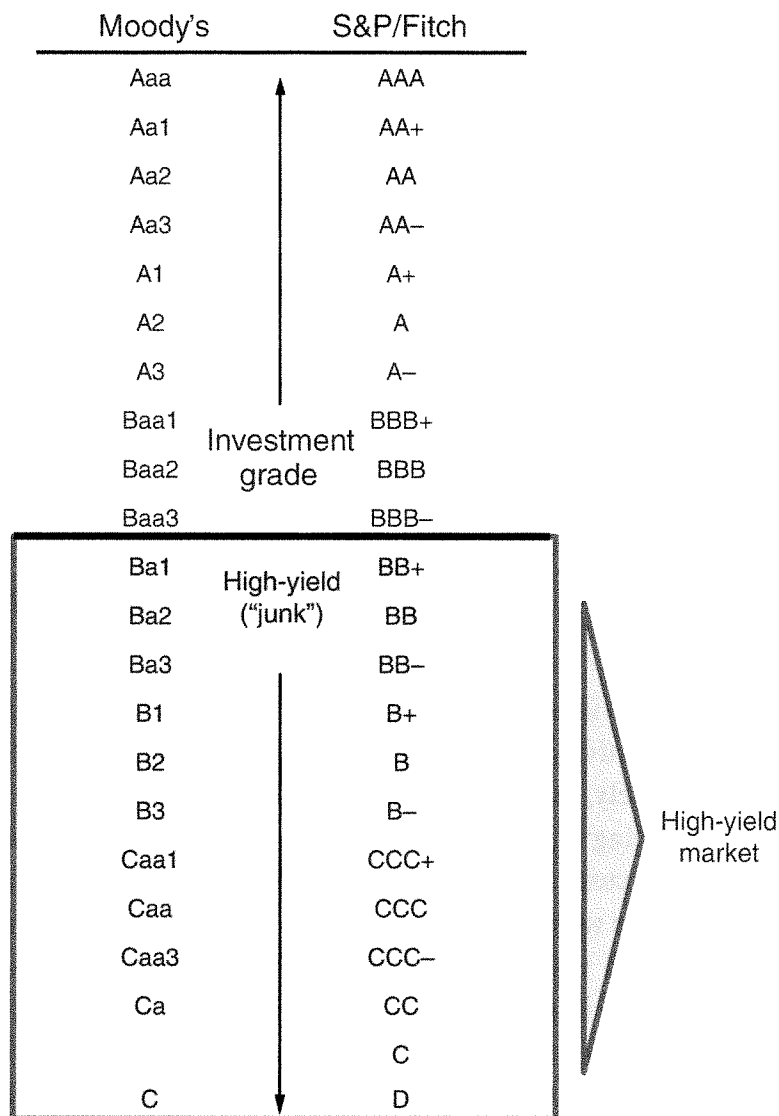
BOX 1 Continued.

-
- Blended ratio/market value models:
 - Altman Z-score (fundamental ratios and market values) – 1968
 - bond score (Credit Sights, 2000; RiskCalc Moody's, 2000)
 - hazard (Shumway 2001)
 - Kamakura's reduced form, term structure model (2002)
 - Z-metrics (Altman *et al* 1995b, RiskMetrics, 2010)
 - Reintroduction of qualitative factors and real-time data (FinTech):
 - stand-alone metrics, eg, invoices, payment history
 - multiple factors – data mining (big data payments, governance, time spent on individual firm reports (eg, CreditRiskMonitor's revised FRISK scores, 2017), etc)
 - enhanced blended models (2000s)
-

on a through-the-business-cycle basis, often based on a “stressed” historical analysis. While the stressed scenario basis for evaluating a firm’s solvency is still an important input, rating agencies no longer embrace the business cycle as the key determinant of whether to change a rating.

What can we say about this process and its evaluative results? Here are our opinions.

- (1) Since the process has been standardized and carried out fairly consistently over time, it can provide important reference points for the market and is well understood as an “international language of credit”. This makes the database of assigned original ratings and rating changes an incredibly important source of data for both researchers and practitioners on an ongoing basis.
- (2) Original rating assignments are done carefully with adequate resources and a strong desire to assess the repayment potential of the firm on specific issues, such as bonds, loans and commercial paper (the so-called plain vanilla issuances of firms) very accurately. The rating assignments do not provide specific quantitative estimates of the PD, but they do provide important benchmarks for not only comparing the actual incidence of default on millions of bond issues for long periods of time but also assessing the bond-rating equivalent (BRE) of nonrated firms and securities in order to eventually provide a PD of corporate debt issuances. Hence, we will show this capability in our own “mortality rate” determination – based on our original work (Altman

FIGURE 1 Major agencies' bond rating categories.

1989), which has since been updated annually – as well as similar analytics introduced by Moody's and S&P in the early 1990s: the so-called cumulative default rates (CDRs) and rating transitions tables (see, for example, S&P Global 2017).

- (3) We have found that the track record of excellent original rating assignments by rating agencies is not matched by their performance regarding the timeliness of rating changes, ie, transitions as the firm's financial and business performance

evolves. Studies such as Altman and Rijken (2004, 2006) clearly show that agency ratings are generally slower to react to changes, primarily deteriorations in performance, than established models based on point-in-time estimations, eg, Z-score-type models or KMV structural estimates. Indeed, rating agencies openly admit that stability of ratings is a very important attribute of their systems and volatile changes are to be avoided. So, it is no surprise that when rating changes do occur, they are slower than those an objective, unemotional model would produce, and these changes, principally downgrades, are typically smaller (ie, have fewer notches) than those a model would have produced. The latter implies that if another rating change were to follow an initial downgrade, it is highly likely that this second change would be in the same direction as the first, ie, there is strong autocorrelation between rating downgrades (see Altman and Kao 1992). We have not encountered much, if any, denial from rating agencies on this observation. After all, the agencies' clients (firms issuing debt) are more comfortable with a system that provides more stable ratings than one that changes, especially negatively, frequently. In addition, those using the service, such as pensions and mutual funds, prefer stability to volatile ratings.

- (4) These observations illustrate the ongoing discussions and heated arguments regarding the objectivity and potential bias of ratings based on agencies' business models, namely, that the entity being rated (firms) also pays for the rating. Critics of rating agencies point to this potential conflict of interest and call for other structures, such as the investor-pay model, or for government agencies to provide ratings. These ideas have been floated but do not seem to have resonated well with the protagonist of the rating industry, ie, the users of ratings, primarily investors. Moreover, investors, in some cases, prefer the stability of ratings over short-term volatility, especially if the changes involve a switch from investment grade to noninvestment grade, or vice versa. Hence, despite efforts by regulators to encourage alternative systems for estimating PDs, such as internally generated or vendor models, ratings from the major rating agencies continue to be an important source of third-party assessment for the market. We feel that models such as the Altman Z-score family can still play a very important role in the investment process, despite the continued prominence of agency ratings.

2 MULTIVARIATE ACCOUNTING/MARKET MEASURES

Continuing the evolutionary history of credit-scoring systems beyond univariate systems (such as those followed by rating agencies and prominent scholarly research

studies by numerous academics, such as Beaver (1966)), we move to the first multivariate study to attack the bankruptcy prediction subjects: my initial Z-score model (1968). Utilizing one of the first discriminant analysis models applied to the economic–financial social sciences, I (Altman 1968) combined traditional financial statement variables with new and more powerful statistical techniques and, aided by early editions of mainframe computers, constructed the original Z-score model. Consisting of five financial indicators, four of which required only one year of financial statements and one that needed equity market values, the original model (Table 1) demonstrated outstanding original and holdout sample accuracies of type I (predicting bankruptcy) and type II (predicting nonbankruptcy) based on a derived cutoff-score approach (discussed later) and using financial data from one annual statement prior to bankruptcy. The original sample of firms utilized only manufacturing companies that filed for bankruptcy-reorganization under the “old” system, called Chapter X or Chapter XI (now combined under Chapter 11). All firms were publicly held and, given the economy in the United States prior to 1966, all had assets under US\$25 million. The sample sizes were small, with only thirty-three firms in each grouping; this is remarkable, as the model is still being used extensively, fifty years after its introduction, on firms of all sizes, including those with billions of dollars in assets. Deakin (1972) compared Beaver’s univariate variables with Altman’s multivariate structure.

The original Z-score model was linear and did not require more than one set of financial statements. Subsequent to its introduction, similar models utilizing linear and nonlinear variable structures as well as different classification techniques, such as quadratic, logit, probit and hazard model structures, were introduced to attempt not only to classify a firm as bankrupt or not, but also to express the outcome in terms of the PD based on the characteristics of the sample of firms used in the model’s development. An alternative approach for developing PDs, based on the Altman BRE method, combined with empirically derived estimates of default incidence for long horizons (eg, 1–10 years) will be discussed shortly.

These discriminant, or logit, models were applied to consumer credit applications (eg, Fair–Isaac (FICO) scores); to nonmanufacturers (eg, ZETA scores (Altman *et al* 1977)); to private and publicly owned firms, in many other countries (built over several decades and continuing to be derived even in current years); to emerging markets (see, for example, Altman *et al* 1995b); to the internal rating systems (IRBs) of banks (starting in the mid-1990s and especially since Basel II was first introduced for discussion in 1999); and to various industries and sizes of firms, including models specifically derived for SMEs (see, for example, Edmister (1972), Altman and Sabato (2007), Altman *et al* (2010b) and, most recently for mini-bond issuers in Italy, Altman *et al* (2016)).

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TABLE 1 Original Z-score component definitions and weightings.

Variable	Definition	Weighting factor
X_1	$\frac{\text{Working capital}}{\text{Total assets}}$	1.2
X_2	$\frac{\text{Retained earnings}}{\text{Total assets}}$	1.4
X_3	$\frac{\text{EBIT}}{\text{Total assets}}$	3.3
X_4	$\frac{\text{Market value of equity}}{\text{Book value of total liabilities}}$	0.6
X_5	$\frac{\text{Sales}}{\text{Total assets}}$	1.0

"EBIT" is earnings before interest and taxes.

Many other exotic statistical and mathematical techniques have been applied to the bankruptcy/default prediction field, including expert systems, neural networks, genetic algorithms, recursive partitioning, and the latest attempts using sophisticated machine-learning methods, motivated by the existence of massive databases and the introduction of nonfinancial data. While these techniques usually surpass the now "primitive" discriminant financial statement-based models in terms of prediction-accuracy tests on original and sometimes holdout samples, the more complex the algorithm and specialized the data sources, the less likely it is that the model will be understood by other researchers and practitioners in its real-world applications.

One class of model that boasts both scholarly and practitioner acceptance and usage is the so-called structural models, built after the introduction of Merton's contingent-claims approach (Merton 1974) for valuing risky debt and the later commercialization of this model by KMV's (1993) credit monitor system (KMV Corporation 2000; McQuown 1993). The latter was and still is (marketed by Moody's since 2001) based on a very large sample of defaults derived from companies on a global basis. The result is a PD estimate derived from a distance-to-default calculation, relying primarily on firm market values, historical market volatility measures and levels of debt. Academic researchers and several consultants have replicated the Merton-structural approach and have oftentimes compared it with their own models as well as more traditional models, such as Z-scores and Kamakura's reduced-form approach (see Chava and Jarrow 2004; van Deventer 2012), with results that do not always point to which approach was superior (see, for example, Das *et al* 2009; Bharath and Shumway 2008; Campbell *et al* 2008).

The most recent attempts at building both accurate and practically acceptable models have utilized what we call a blended ratio/market value/macro-variable approach, with some attempts to also include nonfinancial variables, where data exists. These blended models, eg, *Z*-metrics (Altman *et al* 2010), introduced by Riskmetrics, are probably those that consultants and many financial lenders are either considering or utilizing today, at least compared with more traditionally derived models, sometimes with judgmental adjustments by lending officers. Finally, the latest financial technology (FinTech) innovations explore the use of big data and nontraditional metrics, such as invoice analysis, payable history and governance attributes; “clicks” on negative information events and data (see, for example, CreditRiskMonitor’s revised FRISK^T scoring system (2017)); and social media inputs, in order to capture, on a real-time basis, changes in the credit quality of firms and individuals.

2.1 Machine-learning methods

As for machine-learning and big data techniques, I remain somewhat skeptical as to whether practitioners will accept black-box methods for assessing the credit risk of counterparties. Yes, it is undeniable that the current surge in applications of such techniques has captured the interest of many academics and several start-ups in the FinTech space. Indeed, I collaborated with some colleagues (Barboza *et al* 2017) using several machine-learning models (eg, support vector machines (SVMs), boosting, random forest, etc) to predict bankruptcy from one year prior to the event and compared the results to discriminant analysis, logistical regression and neural network methods. Using data from 1985 to 2013, we found a substantial improvement in prediction accuracy (of about 10%) using machine-learning techniques, especially when, in addition to the five *Z*-score variables, six indicators were included. Our results add one more study to the growing debate of the last few years (2014–17) about the superiority of SVMs versus other machine-learning methods. Almost all of the machine-learning credit models have been published in expert systems and computational journals, with the most prominent being found in *Expert Systems with Applications* (see Barboza *et al* (2017) in our reference list).

3 FROM A SCORING MODEL TO DEFAULT PREDICTION

The construction of a credit-scoring model is relatively straightforward with an adequate and appropriate database of default and nondefault securities, or firms, and accurate predictive variables. In the case of our first model, the *Z*-score method (named in association with statistical *Z*-measures and also chosen because it is the last letter in the English alphabet), the classification as to whether a corporate entity was likely to go bankrupt or not was determined based on cutoff scores between a

TABLE 2 Classification and prediction accuracy: Z-score (Altman 1968) failure model*.

Year prior to failure	Original sample (33)	Holdout sample (25)	1969–75 predictive sample (86)	1976–95 predictive sample (110)	1997–99 predictive sample (120)
1	94% (88%)	96% (72%)	86% (75%)	85% (78%)	94% (84%)
2	72%	80%	68%	75%	74%
3	48%	—	—	—	—
4	29%	—	—	—	—
5	36%	—	—	—	—

*Using 2.67 as cutoff (1.81 cutoff accuracy in parenthesis).

“safe” zone and a “distress” zone, with an intermediate “gray” zone. The zones of discrimination from the original Z-score model (Altman 1968) were as follows:

$$\begin{aligned}
 Z > 2.99, & \text{ “safe” zone,} \\
 1.81 < Z < 2.99, & \text{ “gray” zone,} \\
 Z < 1.81, & \text{ “distress” zone.}
 \end{aligned}$$

These zones were selected based solely on the results of the original, admittedly smallish, samples of thirty-three firms in each of the two groupings (bankrupt and nonbankrupt) from manufacturing firms and their financial statement and equity market values from the 1960s. Any firm whose Z-score was below 1.8 (distressed zone) was classified as “bankrupt” and did, in fact, go bankrupt within one year (100% accuracy); firms whose scores were greater than 2.99 did not go bankrupt (also 100% accuracy), at least until the end of the study period in 1966. There were a few errors in classification for firms with scores between 1.81 and 2.99 (gray zone: three errors out of sixty-six, see Table 2). Keep in mind that these cutoff scores were based solely on the original sample of firms.

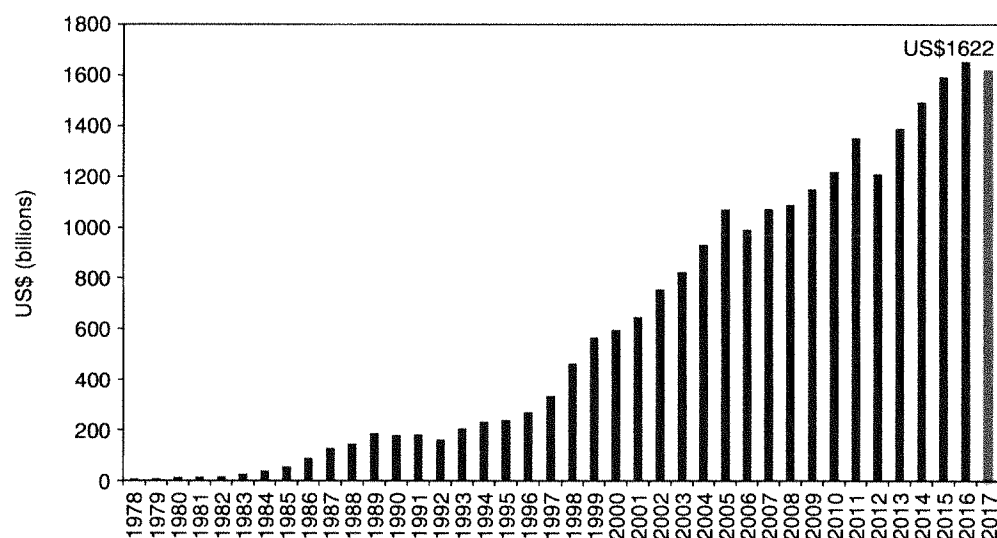
Because the zones were clear, unambiguous and consistent in their subsequent predictions of greater than 85% accuracy, based on data from one year prior to bankruptcy (type I; see Table 2), these designations remain to this day accepted by and useful to market practitioners. While flattering to this writer, this is unfortunate, as it is obvious that the dynamics and trends in creditworthiness have changed significantly over the last fifty years. In addition, classifications of “bankrupt” or “nonbankrupt” are no longer sufficient for many applications of the Z-score model. Indeed, there is very little difference between a firm whose score is 1.81 and one whose score is 1.79; yet, the zones are different. In addition, the “holy-grail” of credit assessment – namely, the PD, and when the default associated with the probability is to take place – is not specified clearly by a certain credit score. We now

examine how credit dynamics have changed over our relevant time periods and how we have moved on to precise PD and timing of default estimates.

4 TIME SERIES IMPACT ON CORPORATE Z-SCORES

When we built the original Z-score model in the mid-1960s, financial credit markets were much simpler – some might say primitive – compared with today’s highly complex, multistructured environment. Innovations such as high-yield bonds; leverage loans; structured financial products; credit derivatives such as credit default swaps (CDSs); and shadow banking loans were nonexistent then, and riskier companies had few financing alternatives outside of traditional bank loans and trade debt. For example, we see from Figure 2 that the North American High Yield Bond market was not “discovered” until the late 1970s, when the only participants were the so-called fallen angel companies that originally raised debt when they were investment grade (IG). When this paper was written in 2017, the size of the high-yield “junk-bond” market had grown from about US\$10 billion of fallen angels in 1978 to about US\$1.7 trillion, mostly “original issue” high yield. In addition, the pace of newly issued high-yield bonds and leverage loans has accelerated since the great financial crisis (GFC) of 2008–9, with more than US\$200 billion worth of new bond issues each year since 2010; this has been fueled by a benign credit cycle, which was in its eighth year as of 2017. Not to be outdone, loans to noninvestment grade companies have again become numerous and available at attractive rates as interest rates have fallen, in general, and banks, despite regulatory oversight guidelines (eg, debt/earnings before interest, tax, depreciation and amortization (EBITDA) ratios not to exceed a certain level, say, 6), have competed with public markets in the United States and Europe. These leveraged loans’ new issues of several hundred billion US dollars per year have swelled corporate debt ratios to an unprecedented level, as firms have exploited the easy money, low interest rate environment and lenders have sought yield, even for the most risky corporate entities. For example, CCC new issues have averaged 15% of all high-yield bond new issues each year over the period 2010–18 (Q2).

Other factors that have reduced the average creditworthiness of companies as the Z-score model has matured in the 50-year period since its inception are global competitive factors, the enormous power of market dominating firms in certain industries, such as Walmart and Amazon in the retail space, and the amazing susceptibility of larger companies to financial distress and bankruptcy. Indeed, when we built the Z-score model in the 1960s, the largest bankrupt firm in our sample had total assets of less than \$25 million (about \$125 million, inflation adjusted) compared to an environment with a median annual number of seventeen firms each year since 1998 with liabilities (and assets) of more than \$1 billion.

FIGURE 2 Size of the US high-yield bond market: 1978–2017 (mid-year; US\$ billions).

Source: NYU Salomon Center estimates using Credit Suisse, S&P and Chili data.

TABLE 3 Median *Z*-score by S&P bond rating for US manufacturing firms: 1992–2017.

Rating	2017 (no.)	2013 (no.)	2004–10	1996–2001	1992–5
AAA/AA	4.30 (14)	4.13 (15)	4.18	5.20	5.80*
A	4.01 (47)	4.00 (64)	3.71	4.22	3.87
BBB	3.17 (120)	3.01 (131)	3.26	3.74	2.75
BB	2.48 (136)	2.69 (119)	2.48	2.81	2.25
B	1.65 (79)	1.66 (80)	1.74	1.80	1.87
CCC/CC	0.90 (6)	0.33 (3)	0.46	0.33	0.40
D	−0.10 (9) ^a	0.01 (33) ^b	−0.04	−0.20	0.05

Source: Compustat database, mainly S&P 500 firms, compilation by E. I. Altman, NYU Salomon Center, Stern School of Business. *AAA only. ^aFrom 01/2014 to 11/2017. ^bFrom 01/2011 to 12/2013.

To demonstrate the implied deterioration in corporate creditworthiness over the last fifty years, one can observe our median *Z*-score statistics using the S&P credit rating for various sample years shown in Table 3. First, the number of AAA ratings dwindled to just two in 2017 (Microsoft and Johnson & Johnson) from more than fifteen twenty years ago and ninety-eight in the early 1990s. Hence, we now combine AAA- and AA-rated companies to analyze average *Z*-scores, and that median decreased from a high of 5.20 in the 1996–2001 period to 4.13 in 2013. More important is the steady deterioration of median *Z*-scores for single-B companies from

1.87 in 1992–5 to 1.65 in 2017. Recall that a score of below 1.8 in 1966 classified a firm as in the distress zone and a strong bankruptcy threat. However, in the last fifteen or so years, the dominant and largest percentage of issuance in the high-yield market was for single-Bs, and surely all single-Bs do not default! True, a median single-B has a distribution in which 50% of its issues are higher than 1.65, but the probability that all Bs default within five years of issuance is, approximately, “only” 28% (see our mortality rate discussion below). Finally, the median D (default-rated company) had a Z-score of -0.10 in 2017, while the median Z-score in 1966 for bankruptcy entities was $+0.65$ (see Altman 1968; Altman and Hotchkiss 2006). In all time periods of late, the median D firm’s Z-score was zero or below (Table 3). Hence, we suggest that a score below zero is consistent with a defaulted company. The cutoff of 1.8, based on our original sample, will place an increasing number, perhaps as much as 25% of all firms, in the old distress zone. Since only a very small percentage of all firms fail each year and an average of about 3.5% of high-yield bond companies default each year, based on data over the last (almost) fifty years (see our default rate calculations in Altman and Kuehne (2017)), the so-called type II error (predicting default when the firm does not) has increased from about 5% in our original analysis to possibly 25–30% in recent periods. Hence, we do *not* recommend that users of our Z-score model make their assessments of a firm’s default likelihood based on a cutoff score of 1.8. Instead, we recommend using BREs based on the most recent median Z-scores by bond rating, such as the data listed in Table 3. These BREs can then be converted into more granular PD estimates, as we now discuss.

4.1 PD estimation methods

Box 2 lists two methods that we have used over the years to estimate the PD and LGD of a firm’s bond issue at any point in time. The starting point in both methods is a well-constructed and, if possible, intuitively understandable credit-scoring model. For example, in method (1), the Z-score on a new or existing debt issuer is assigned a BRE on a representative sample of bond issues for each of the major rating categories (see Table 3) or, if available, more granular ratings with (+) or (–) “notches” (S&P/Fitch), or 1, 2, 3 (Moody’s). See Table 6, later in the paper, for the more granular categorization of another of the Altman Z-score models: Z’’-scores.

In addition to the matching of Z-scores by rating category, we can also assess the PD of an issue for various periods of time in the future. The more traditional time-dependent method is called the CDR. Such rates are provided by all of the rating agencies and by several of the investment banks, who provide continuous research on defaults, particularly for the speculative grade or high-yield (“junk

BOX 2 Estimating PD and probability of LGD.

Method (1)

- Credit scores on new or existing debt.
- BREs on new issues (mortality) or existing issues (rating agencies' CDRs).
- Utilizing mortality rates to estimate marginal and cumulative defaults.
- Estimating default recoveries and probability of loss.

Or...

Method (2)

- Credit scores on new or existing debt.
- Direct estimation of the PD based on logistic regressions.
- Based on PDs, assign a rating.

bond”) market. This compilation is an empirically derived PD estimate of bonds with a certain rating, eg, “B”, at a point in time, and then the default incidence is observed 1, 2, . . . , 10 years after that point in time. The estimate is for all B-rated bonds, regardless of the age of the bond when it is first tracked. In my opinion, this PD estimate is more appropriate for an existing bond issuer’s debt than for bonds when they are first issued. Almost all of the rating agencies, with the exception of Fitch Inc, calculate CDRs based on the number of issuers that default over time compared with the number of issuers in possession of a certain rating at the starting point (regardless of the different ages of the bonds in the basket of, say, B-rated bonds). Therefore, on average, an S&P B-rated bond had about a 5% incidence of default within one year based on a sample of bonds from 1980 to 2016 (see S&P Global 2017).

Before the rating agencies first compiled their CDRs, Altman (1989) created the mortality rate approach for estimating PDs for bonds of all ratings, specifically newly issued bonds, based on the dollar amounts of new issues by bond rating, rather than by issuer. These mortality estimates are based on insurance actuarial techniques for calculating the marginal and CMR, as shown in Box 3. I feel, as with human mortality, that there are certain characteristics of bonds, or loans, at birth that are critical in determining the likelihood of default up to/over ten years after issuance (the usual maturity of newly issued bonds). In addition, those characteristics can be summarized into an issue’s (but not an issuer’s) bond rating at birth. Implicit in these PD estimates is the aging effect of a bond issue, whereby the mortality rate of the first year after issuance is relatively low compared with that of the second year; similarly, the marginal rate of the second year is usually lower than that of the third, as shown

BOX 3 Marginal and cumulative mortality rate actuarial approach.

$$\text{MMR}_{(r,t)} = \frac{\text{total value of defaulting debt from rating } r \text{ in year } t}{\text{total value of the population at the start of year } t},$$

where MMR is the marginal mortality rate.

One can measure the cumulative mortality rate (CMR) over a specific time period $(1, 2, \dots, T \text{ years})$ by subtracting the product of the surviving populations of each of the previous years from one (1.0), that is,

$$\text{CMR}_{(r,t)} = 1 - \prod \text{SR}_{(r,t)}, \quad t = 1, \dots, N, \quad r = \text{AAA}, \dots, \text{CCC}.$$

Here, $\text{CMR}_{(r,t)}$ is the cumulative mortality rate of r in t , and $\text{SR}_{(r,t)}$ is the survival rate in (r, t) , $1 - \text{MMR}_{(r,t)}$.

TABLE 4 Mortality rates by original rating: all rated corporate bonds*, 1971–2016 (all values are percentages).

		Years after issuance									
		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.00	0.00	0.00
	Cumulative	0.00	0.00	0.00	0.00	0.01	0.03	0.04	0.04	0.04	0.04
AA	Marginal	0.00	0.00	0.20	0.06	0.02	0.01	0.01	0.01	0.02	0.01
	Cumulative	0.00	0.00	0.20	0.26	0.28	0.29	0.30	0.31	0.33	0.34
A	Marginal	0.01	0.03	0.11	0.12	0.09	0.05	0.02	0.24	0.07	0.04
	Cumulative	0.01	0.04	0.15	0.27	0.36	0.41	0.43	0.67	0.74	0.78
BBB	Marginal	0.32	2.34	1.24	0.98	0.49	0.22	0.25	0.16	0.17	0.33
	Cumulative	0.32	2.65	3.86	4.80	5.27	5.48	5.71	5.86	6.02	6.33
BB	Marginal	0.92	2.04	3.85	1.95	2.42	1.56	1.44	1.10	1.41	3.11
	Cumulative	0.92	2.94	6.68	8.50	10.71	12.11	13.37	14.32	15.53	18.16
B	Marginal	2.86	7.67	7.78	7.75	5.74	4.46	3.60	2.05	1.73	0.75
	Cumulative	2.86	10.31	17.29	23.70	28.08	31.29	33.76	35.12	36.24	36.72
CCC	Marginal	8.11	12.40	17.75	16.25	4.90	11.62	5.40	4.75	0.64	4.26
	Cumulative	8.11	19.50	33.79	44.55	47.27	53.40	55.91	58.01	58.28	60.05

Source: S&P (New York) and author's compilation. * Rated by S&P at issuance. Based on 3280 defaulted issues.

in Table 4. Note that the mortality rates in Table 4 are based on the incidence of default for a forty-six-year period, 1971–2016. For example, the marginal default (or mortality) rate of a BB-rated issue for years 1, 2 and 3 after issuance is 0.92%, 2.04% and 3.85%, respectively. After three years, the marginal rates seem to flatten out at between 1.5% and 2.5% per year.

TABLE 5 Mortality losses by original rating: all rated corporate bonds*, 1971–2016 (all values are percentages).

		Years after issuance									
		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00
	Cumulative	0.00	0.00	0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.03
AA	Marginal	0.00	0.00	0.03	0.02	0.01	0.01	0.00	0.01	0.01	0.01
	Cumulative	0.00	0.00	0.03	0.05	0.06	0.07	0.07	0.08	0.09	0.10
A	Marginal	0.00	0.01	0.04	0.05	0.05	0.04	0.02	0.02	0.05	0.03
	Cumulative	0.00	0.01	0.05	0.10	0.15	0.19	0.21	0.23	0.28	0.31
BBB	Marginal	0.23	1.53	0.70	0.58	0.26	0.16	0.10	0.09	0.10	0.18
	Cumulative	0.23	1.76	2.44	3.01	3.26	3.42	3.51	3.60	3.70	3.87
BB	Marginal	0.55	1.18	2.30	1.11	1.38	0.74	0.78	0.48	0.73	1.09
	Cumulative	0.55	1.72	3.98	5.05	6.36	7.05	7.78	8.22	8.89	9.88
B	Marginal	1.92	5.38	5.32	5.20	3.79	2.45	2.34	1.13	0.91	0.53
	Cumulative	1.92	7.20	12.13	16.70	19.86	21.82	23.65	24.52	25.20	25.60
CCC	Marginal	5.37	8.68	12.49	11.45	3.42	8.61	2.32	3.34	0.40	2.72
	Cumulative	5.37	13.58	24.38	33.04	35.33	40.89	42.27	44.19	44.42	45.93

Source: S&P (New York) and author's compilation. *Rated by S&P at issuance. Based on 2714 issues.

Method (1)'s PD estimate is derived from Box 3's equations. When these have been adjusted for recoveries on the defaulted issue, we can derive estimates for the LGD in Table 5. This critical LGD estimate can be utilized to estimate expected losses in a bank's Basel II or III capital requirements, or for an investor's expected loss on a portfolio of bonds categorized by bond rating. (See our discussion of lender applications later in Table 8). The earliest measures of LGD that I am aware of are from Altman (1977), Altman *et al* (1977) and Altman (1980). Later, it was found that the key variable in estimating LGD is the concurrent PD (Altman *et al* 2005).

Method (2) utilizes a different approach to estimate PDs. Instead of using empirical estimates of defaults by bond rating, companies are analyzed with a logistic regression methodology, whereby the company is assigned a "0" or "1" dependent variable based on whether it has defaulted or not at a specific point in time. Then, a number of independent explanatory variables are analyzed in the regression format to arrive at a PD estimate of between 0 and 1. The resulting PDs are then assigned a rating equivalent based on, for example, the percentage of bond issues that are AAA, AA, A, . . . , CCC in the real world. This logistic structure is used widely in the academic literature and has been a standard technique ever since the early work of Ohlson (1980). We (see, for example, Altman and Rijken (2010) on Z-metrics) have also used it for our hybrid model estimations.

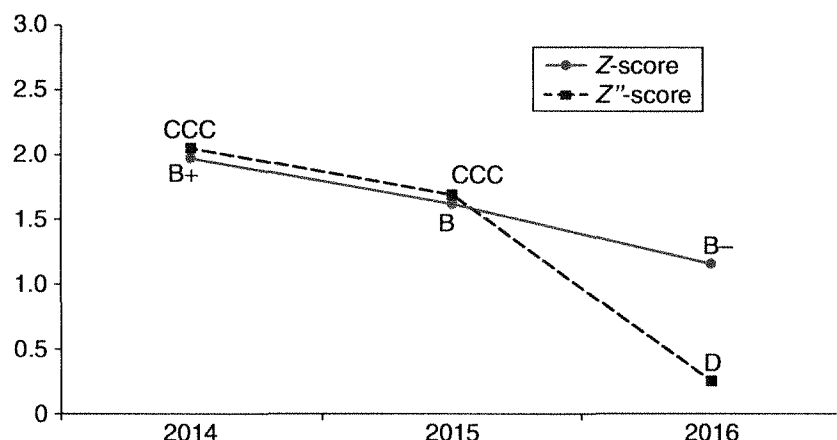
So, which is the superior technique for estimating PD: method (1) or method (2)? I favor the BRE approach for newly issued debt (the mortality rate approach), but for existing issues the CDR method seems to be more appropriate. The reasons are as follows. The mapping of PDs to BREs using mortality rates, or CDRs, is based on over one million issues and about 3500 defaults over the last forty-five years. Logistical regression models' PDs are solely a function of the sample characteristics used to build the model, and the results are based on the logistic structure, which may not be representative of large sample properties. The beauty of logistical regression estimates, however, is that the analyst can access PDs directly from the results and avoid the mapping of scores as an intermediate step. Tests of type I and type II accuracies are available for both methods, along with statistical area under the curve (AUC) accuracy measures on both original and holdout samples. The latter is very important in helping to validate the empirical results from samples over time and from different industrial groups. From my experience, both methods have yielded very impressive type I accuracies in numerous empirical tests.

5 Z-SCORE MODEL FOR INDUSTRIALS AND PRIVATE FIRMS

As noted earlier, the original 1968 Z-score model was based on a sample of manufacturing, publicly held firms, whose assets and liability size amounted to no greater than US\$25 million. The fact that this model has retained its high type I accuracy on subsequent samples of manufacturing firms (Table 2) and is still used extensively by analysts and scholars, even for nonmanufacturers, is quite surprising given that it was developed fifty years ago. It is evident, however, that nonmanufacturing firms, such as retailers and service firms, have very different asset and liability structures as well as income statement relationships with asset levels, eg, the sales/total assets ratio, which is considerably greater on average for retail companies than for manufacturers, perhaps even twice as high. And, given the 1.0 weighting for the variable (X_5) in the Z-model (see Table 1), most retail companies have a higher Z-score than manufacturers. Even the beleaguered Sears, Roebuck and Company's latest Z-score (see Figure 3) was 1.3 in 2016: that is equivalent to a BRE of B—, or a D rating if we are using the Z'' -score (discussed next). The latter model does not contain the sales/total asset ratio and was developed for a broad cross-section of industrial sector firms as well as firms outside of the United States (see Altman *et al* 1995b).

To adjust for any industrial sector impact, we have built second-generation models for a more diverse industrial grouping, eg, the ZETA model (Altman *et al* 1977), and for diverse firms in emerging markets (Altman *et al* 1995b). Additional Z-score models have been developed over the last fifty years for various organizational structured firms, eg, private firms (Z'), developed at the same time as the original Z-model (1968); textile firms in France (Altman *et al* 1974); industrials in the United

FIGURE 3 Z- and Z''-score models applied to Sears, Roebuck and Company: BREs and scores from 2014 to 2016.



Source: S&P Capital IQ and NYU Salomon Center calculations.

States (ZETA, Altman *et al* 1977), Brazil (Altman *et al* 1979), Canada (Altman and Lavallee 1981), Australia (Altman and Izan 1982), China (Altman *et al* 2010a) and South Korea (Altman *et al* 1995b); and non-US emerging market (Z'') firms (Altman *et al* 1995b). SME models have been produced for the United States (Altman and Sabato 2007) and the United Kingdom (Altman *et al* 2010b), for Italian SMEs and minibonds (Altman *et al* 2016) and for sovereign default risk assessment (Altman and Rijken 2011).

6 PRIVATE FIRM MODELS

It has been most convenient to build credit-scoring models for publicly owned, listed companies in the United States and abroad due to data availability. Models for private firms can be built, indirectly, by using only those variables related to private firms but based on publicly owned firm data, or by accessing databases that are populated by both publicly owned and private companies. The latter source of data is especially available in several European countries via tax reporting and government credit bureau sources (eg, the United Kingdom) as well as firms' private databases, eg, from Bureau van Dijk (now owned by Moody's).

I used the indirect method in the Z'-score models, which is discussed in Altman (1983) and shown in Box 4. The only difference between this and the original Z-score model is the substitution of the book value of equity for the market value in X_4 . Note that all of the coefficients are now different, but only slightly so, and the zones (safe, gray and distress) are slightly different as well. There is some loss in

BOX 4 Z' -score private firm model.

$$Z' = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.420X_4 + 0.998X_5,$$

$$X_1 = \frac{\text{current assets} - \text{current liabilities}}{\text{total assets}},$$

$$X_2 = \frac{\text{retained earnings}}{\text{total assets}},$$

$$X_3 = \frac{\text{earnings before interest and taxes}}{\text{total assets}},$$

$$X_4 = \frac{\text{book value equity}}{\text{total liabilities}},$$

$$X_5 = \frac{\text{sales}}{\text{total assets}}.$$

Source: author's calculations.

BOX 5 Z'' -score model for manufacturers and nonmanufacturer industrials as well as developed and emerging market credits (1995).

$$Z'' = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4,$$

$$X_1 = \frac{\text{current assets} - \text{current liabilities}}{\text{total assets}},$$

$$X_2 = \frac{\text{retained earnings}}{\text{total assets}},$$

$$X_3 = \frac{\text{earnings before interest and taxes}}{\text{total assets}},$$

$$X_4 = \frac{\text{book value of equity}}{\text{total liabilities}}.$$

Source: author's calculations from Altman *et al* (1995b).

accuracy due to this model adjustment, but, over the years, this private firm model has retained its accuracy based on applications to individual private firm bankruptcies. These results have never been published, however.

I have also built numerous models for firms in non-US countries, generally following the pattern of first trying the original model on a sample of local firm bankruptcies and nonbankruptcies before adding or subtracting the variables thought to be helpful in those countries for a more accurate prediction. In some cases, different criteria for the distressed firm sample had to be used due to a lack of formal bankruptcies. One example is our China model (Altman *et al* 2010a), which utilized firms classified as “ST” (special treatment) due to their consistent losses and their book equity dropping below par value. In others, such as in Australia (Altman and Izan 1982),

TABLE 6 US BREs based on Z'' -score model: $Z'' = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$.

Rating	Median 1996 Z'' -score ^a	Median 2006 Z'' -score ^a	Median 2013 Z'' -score ^a
AAA/AA+	8.15 (8)	7.51 (14)	8.80 (15)
AA/AA-	7.16 (33)	7.78 (20)	8.40 (17)
A+	6.85 (24)	7.76 (26)	8.22 (23)
A	6.65 (42)	7.53 (61)	6.94 (48)
A-	6.40 (38)	7.10 (65)	6.12 (52)
BBB+	6.25 (38)	6.47 (74)	5.80 (70)
BBB	5.85 (59)	6.41 (99)	5.75 (127)
BBB-	5.65 (52)	6.36 (76)	5.70 (96)
BB+	5.25 (34)	6.25 (68)	5.65 (71)
BB	4.95 (25)	6.17 (114)	5.52 (100)
BB-	4.75 (65)	5.65 (173)	5.07 (121)
B+	4.50 (78)	5.05 (164)	4.81 (93)
B	4.15 (115)	4.29 (139)	4.03 (100)
B-	3.75 (95)	3.68 (62)	3.74 (37)
CCC+	3.20 (23)	2.98 (16)	2.84 (13)
CCC	2.50 (10)	2.20 (8)	2.57 (3)
CCC-	1.75 (6)	1.62 (5) ^b	1.72 (4) ^b
CC/D	0 (14)	0.84 (120)	0.05 (94) ^c

^aSample sizes in parentheses. ^bInterpolated between CCC and CC/D. ^cBased on ninety-four Chapter 11 bankruptcy filings, 2010–13. Sources: Compustat, company filings and S&P.

the explanatory variables were all adjusted for industry averages, so the model was thought to be more appropriate and accurate across a wide spectrum of industrial sectors. For the sovereign risk assessment model (Altman and Rijken 2011), in addition to traditional financial ratios, market value levels and volatility measures, the authors added macroeconomic variables, such as yield spreads and inflation indicators, to their Z -metrics model, which they applied to all nonfinancial, listed firms in order to assess the sovereign's private sector health. This modeling approach is applicable to any country in the world as long as data on listed or nonlisted private sector companies is available. The issue of sovereign risk application will be discussed again later, following Table 8.

7 THE Z'' -SCORE MODEL

As noted in Figure 3, we built a model (Z'' -score) for all industrials, manufacturers and nonmanufacturers, in 1995, first applying it to Mexican companies and then to other Latin American firms. It has since been successfully applied in the United

States and many other countries, usually with superior accuracy compared with the original Z-score model if the data includes nonmanufacturers. This Z'' -score model is also applicable to privately owned firms, since X_4 is denominated in book equity to total liabilities, not market values. This substitution is particularly important for environments where the stock market is not considered a good valuation measure due to its size, scope, liquidity or trading factors. In addition, note that the original fifth variable, sales/total assets, is no longer in this model. We found that the X_5 variable was particularly sensitive to industrial sector differences, eg, retail or service firms versus manufacturing companies, and in countries where the capital for investment in fixed assets was inadequate. Finally, this version of the Altman family of models that use discriminant analysis also has a constant term (3.25). This constant standardizes the results such that scores slightly above or below zero are in the D-rated BRE (see Table 6 for BREs that are even more granular than the major rating categories). The type I accuracy of the Z'' -score model over time is shown in Table 7.

8 SCHOLARLY IMPACT

Perhaps because of their simplicity, transparency and consistent accuracy over the years, the Z-score models have been referenced and used as benchmarks in a large number of academic and practitioner studies in finance and accounting. These references and comparisons have taken at least three forms. The first involves constructing alternative models and frameworks to predict bankruptcy or defaults. The original model and its success using a combination of financial and market valuation data with robust statistical analysis made the task of default risk assessment more attractive to scientific researchers in many disciplines. It opened the door for not only finance and accounting scholars but also statisticians and mathematicians to find better and more efficient indexes and to examine new indicators and techniques, especially as more expansive and easily accessible databases became available.

New frameworks have involved seemingly more powerful statistical and mathematical techniques, such as logit, probit or quadratic nonlinear regressions; artificial intelligence; neural networks; genetic algorithms; recursive partitioning; machine learning; and structural, distance-to-default or hazard models, among others. Since the Z-score model is easily replicable, it was chosen by many researchers to be compared in terms of accuracy of classification and prediction. These studies are too numerous to list individually, but they probably number in the hundreds, including several by this author with numerous coauthors (see the bibliography).¹ This

¹ Indeed, Bellovary *et al* (2007) review 165 bankruptcy prediction models from 1965 to 2006, including many by this author, and a large number of similar articles. They conclude that multiple

combination of simple, but theoretically well-grounded, empirical analysis provided new and attractive avenues in bankruptcy research, laying the foundation for an expanded modern understanding of bankruptcy prediction. For example, recent studies (by Altman, Iwanicz-Drozdowska, Laitinen and Suvas in 2016 and 2017) have looked at several dimensions of bankruptcy prediction research for (a) long distance (ten years) time series accuracy, (b) a number (five) of different statistical techniques, and (c) numerous (thirty-four) different country databases and environments. The results, covering thirty-one European countries and three others (China, Colombia and the United States), showed that, while models built specifically for individual countries usually outperformed the original Z -models, the added value of new country-specific variables and data as well as numerous frameworks was not dramatic. Despite somewhat higher accuracies using the Z'' -score variables on data specific to each country, we found that the original weightings continued to exhibit remarkable performances, despite their being determined more than two decades earlier. Duffie *et al* (2007) also explored the multiperiod aspects of a bankruptcy prediction model.

Studies using accounting data, among other variables, potentially suffer when that data either is not very reliable, eg, from emerging markets, or is subject to earnings management manipulations. A recent study by Cho *et al* (2012) reconstructed Z -scores for this manipulation with the resulting accuracy improved.

The second dimension of the Z -score's scholarly impact is its international "reach". Since the original model and its derivatives (eg, Z'' -score) have stood the test of time, the model has been widely applied in multiple settings, including applications across all domains, with its sharp focus on a few key variables. Also

discriminant analysis and neural networks are the most promising methods for bankruptcy prediction, but caution that higher model accuracy is not guaranteed by using a greater number of factors. According to the authors, "since Altman's study, the number and complexity of bankruptcy prediction models have dramatically increased". Keasey and Watson (1991) describe discriminant analysis as the main technique used in this knowledge field. Willer do Prado *et al* (2016) found that logistic regression and neural networks became popular after the 1990s, with logistic regression and discriminant analysis being the most-used techniques up to the end date of their article's sample period in 2014. Willer do Prado *et al* used bibliometric evaluation (see Pinto *et al* 2014) to evaluate research about credit risk and bankruptcy using Reuters "Web of Science" database from 1968 to 2014. They found, through their exhaustive investigation, that the bankruptcy prediction field appeared to be multidisciplinary, spanning not only finance and accounting but also operations research, management, mathematics, data processing, engineering and a broad range of statistical fields. Unsurprisingly, they discovered an increased number of bankruptcy studies after the 2008 crisis. Finally, Willer do Prado *et al* (2016) listed the ten most-cited articles in the bankruptcy prediction field (Table 3 in their study), with Altman (1968) registering 1483 Web of Science cites. The next most-cited article was Huang *et al* (2004) with 250, and Hillegeist *et al* (2004) came in third with 165 cites.

TABLE 7 Classification and prediction accuracy (type I): Z-score bankruptcy model*.

No. of months prior to bankruptcy filing	Original sample (33)	Holdout sample (25)	2011–14 predictive sample (69)
6	94%	96%	93%
18	72%	80%	87%

*See Altman *et al* (1995b); see also summary in Altman and Hotchkiss (2006).

important are its robust empirical stability over long periods of time and its global applicability and understandability. We are familiar with Z-score-type models being built and tested in at least thirty different countries, based on at least seventy individual articles, and even more in studies analyzing at least that many countries in a single study. Indeed, I helped assemble two special journal issues devoted to a large number of specific country models.² Those studies, and more, are also listed and described in Altman and Hotchkiss (2006, Appendix to Chapter 11). More recent studies can be found in our earlier discussion on scholarly impact and in Choi (1997).

The third dimension is related to its impact on corporate financial management, especially the important subject of optimal capital structure and the trade-off between the tax advantage of debt financing and expected bankruptcy and other distress costs. My contribution to this question (Altman 1984) discussed and measured empirically, for the first time, the so-called indirect bankruptcy costs. In addition, since both tax benefits and bankruptcy costs are based on expected values, contingent upon the probability of bankruptcy, an important aspect of the trade-off debate is that probability. We selected the Z-score model's expected default probability algorithm, albeit an early version of the probability estimation technique, to complete the empirical measures for firms that went bankrupt in three different industrial sectors. Our findings were cited directly by an in-depth study from *The Economist* (Emmott 1991), which highlighted Modigliani/Miller's irrelevance theories compared with traditional optimal capital structure arguments. Perhaps the main differences between the two theories are the existence and magnitude of expected bankruptcy costs. These arguments are still among the most important fundamental and hotly debated issues in modern corporate financial management, and references to the bankruptcy cost measure can be found in countless corporate finance articles as well as just about every relevant basic or advanced textbook.

² The two special issues of *Journal of Banking & Finance* on international bankruptcy prediction models that I edited were published in 1984 (Volume 8, Issue 2) and 1988 (Volume 12, Issue 7).

9 FINANCIAL DISTRESS PREDICTION APPLICATIONS

Over the last fifty years, we have gleaned numerous insights and ideas from many helpful, interested financial market practitioners and academic colleagues with respect to applications of the *Z*-score models.³ I will be forever grateful for these insights, because it means so much to a researcher to see his or her scholarly contributions make their way into the real world and be applied in a constructive way.⁴ Table 8 provides lists of those applications whereby I, and others, have utilized the Altman *Z*-score family of models for both external-to-the-firm (left column) and internal-to-the-firm (right column) and research (right column) analytics and applications. There is no time or space in this paper to discuss all of these applications, so I defer a more comprehensive discussion to our revised text (Altman *et al* 2019). In this paper, however, we will discuss just those listed in italics in Table 8.

10 LENDER APPLICATIONS

Throughout this paper, I have discussed a number of important applications of credit risk models, such as *Z*-scores for lending institutions. These include the accept/reject decision (Altman 1970), estimates of the PD and LGD (Altman 1989), and costs of errors in default loss estimation (see, for example, Altman *et al* 1977). In addition to these generalized applications, the introduction of Basel II in 1999 drew upon *Z*-scores and the structure proposed in CreditMetrics (Gupton *et al* 1977). Later, Gordy (2000, 2003), among others, discussed the anatomy of credit risk models and capital allocation under Basel II.

11 TO FILE CHAPTER 11 OR NOT

One of the most interesting and rewarding applications of the *Z*-score model, at least for me, was the essence of my testimony on December 5, 2008 before the US House of Representatives Finance Committee's deliberation on whether to continue to bail out General Motors, Inc (GM) and Chrysler Corporation, or to "suggest" that these firms file for the "privilege" or "right" to reorganize under the protective confines of Chapter 11 of the US Bankruptcy Code. In the history of the US financial and legal systems, this choice had been given to very few firms that had the opportunity to qualify for bailout with taxpayers' monies. However, countless distressed firms

³ I apologize to the many authors whose published studies are not specifically cited; I also appreciate immensely their interest in and the attention paid to our models' extensions and tests over time.

⁴ Indeed, the *Z*-score model has even made its way into a novel written by a bestselling author: see Thomas Pynchon's *Bleeding Edge* (2013, p. 63).

TABLE 8 Z-score's financial distress prediction applications.

External (to the firm) analytics	Internal (to the firm) and research analytics
<ul style="list-style-type: none"> • <i>Lenders (eg, pricing, Basel capital allocation)</i> <ul style="list-style-type: none"> • Bond investors (eg, quality junk portfolio) • Long/short investment strategy on stocks (eg, baskets of strong balance sheet companies and indexes: STOXX, Goldman, Nomura, Morgan Stanley, for example) • Security analysts and rating agencies • Regulators and government agencies • Auditors (audit risk, going concern model) • Advisors (eg, assessing clients' health) • M&A (eg, bottom fishing) 	<ul style="list-style-type: none"> • <i>To file or not (eg, GM)</i> <ul style="list-style-type: none"> • <i>Comparative risk profiles over time</i> • <i>Industrial sector assessment (eg, energy)</i> • <i>Sovereign default risk assessment</i> • Purchasers, suppliers assessment • Accounts receivable management • Researchers – scholarly studies • Chapter 22 assessment • <i>Managers – managing a financial turnaround</i>

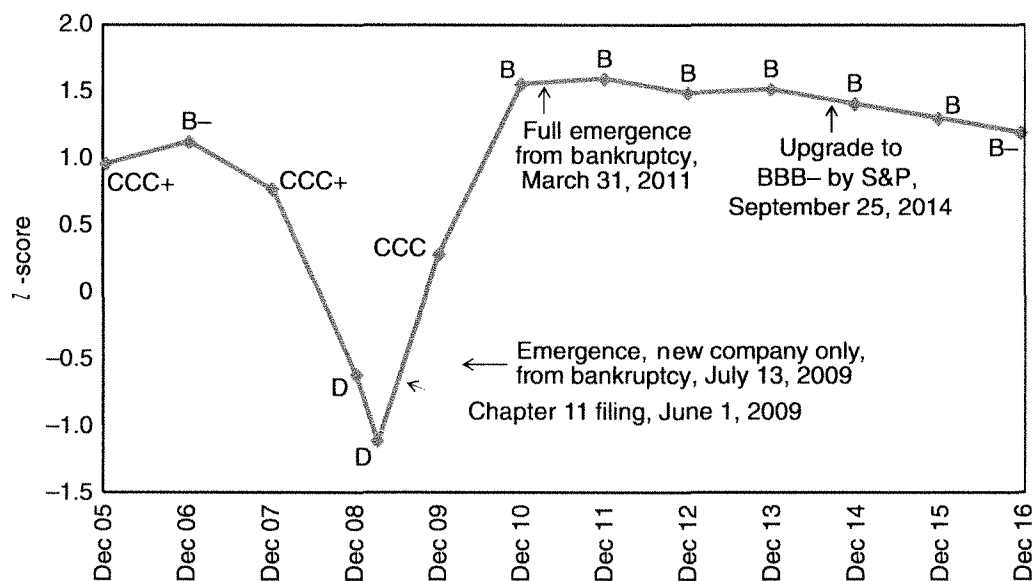
Source: Altman, NYU Salomon Center.

consider whether to file or not when they or their creditors face the prospect of the very survival of their company as a going concern.

The House invited a panel of academics and practitioners to discuss two issues: (1) whether the CEOs of the “Big Three” US auto-makers, in presenting their restructuring plans and strategies, should be granted an additional loan subsidy from Troubled Asset Relief Program (TARP) funds (Ford did not apply); and (2) whether these large auto-dealers should be bailed out or made to file for bankruptcy reorganization like the vast majority of ailing companies. For my testimony, we presented arguments on the benefits of Chapter 11, such as the ability to borrow monies with debtor-in-possession (DIP) financing and the automatic stay on nonessential interest and principal on existing loan obligations.⁵ We also presented analyses of the then-current, and historical, Z-scores and their BREs. The data shown in Figure 4 was one of the primary determinants for my conclusion that GM was destined to go bankrupt, even with a temporary bailout, and should thus file for bankruptcy reorganization as soon as it was feasible to do so.

Note that GM's Z-score was in the CCC BRE, a highly risky zone, for several years before the crisis in 2008, even when it was still considered investment grade by all of the rating agencies (eg, in 2005; see Figure 4). In addition, at the time of

⁵ The complete testimony can be found on YouTube: “Altman testimony before the US House of Representatives Finance Committee”, December 5, 2008.

FIGURE 4 Z-score model applied to GM (consolidated data): BREs and scores from 2005 to 2016.

my testimony in December 2008, GM's score was -0.63 , deep into the D-rated BRE zone. Hence, I strongly suggested a Chapter 11 filing and that GM should petition the bankruptcy court for a US\$50 billion DIP loan, most likely from the Federal Government since none of the major banks at that time were in sufficient financial shape to offer a loan of that size. The House, and particularly its Finance Committee members, voted to continue the bailout, despite my arguments. The US Senate, however, voted not to continue the bailout. Nevertheless, before leaving office, President George W. Bush provided, by executive order, the bailout to give GM and Chrysler more time to restructure. It was now "Obama's problem". GM's Z-score continued to crater in the early months of 2009 and, despite management changes and the bailout, the company finally filed for bankruptcy under Chapter 11 on June 1, 2009. To assist the reorganization, Congress and the bankruptcy court provided a US\$50 billion DIP loan: the exact amount I had suggested six months earlier!

In a remarkably short period – just forty-three days – GM emerged from bankruptcy and was once again on its way to being a going concern. Figure 4 shows the firm's improvement from deep in the D-rated BRE zone to a B-rated BRE in about twelve to eighteenth months. The DIP loan was first exchanged for new equity, and that equity was subsequently sold in the open market, whereby not only did the government not lose any of its "investment", it actually made a profit! GM today is a solid, thriving global auto-competitor with, again, an investment-grade rating (BBB),

TABLE 9 Comparing the financial strength of high-yield bond issuers in 2007 and 2012, 2014 and 2016 (3Q).

Year	Number of firms		Average Z-score/ (BRE)*	Median Z-score/ (BRE)*	Median Z'-score/ (BRE)*	Median Z''-score/ (BRE)*
	Z-score	Z''-score				
2007	294	378	1.95 (B+)	1.84 (B+)	4.68 (B+)	4.82 (B+)
2012	396	486	1.76 (B)	1.73 (B)	4.54 (B)	4.63 (B)
2014	577	741	2.03 (B+)	1.85 (B+)	4.66 (B+)	4.74 (B+)
2016 (3Q)	581	742	1.97 (B+)	1.70 (B)	4.44 (B)	4.63 (B)

Source: author's calculations, and data from Altman and Hotchkiss (2006) and S&P Capital IQ/Compustat. *BRE.

which it achieved in 2014. However, note that the Z-score model placed GM in the single-B BRE at the end of 2014, not at investment grade. This low BRE continued through the end of 2016. So, while GM has indeed improved considerably since its bankruptcy, it was still, to me, of a noninvestment grade.

12 COMPARATIVE RISK PROFILE OVER TIME

Students of history often ask to compare a current situation with that of some past period(s). This query is particularly relevant in financial markets, when a benchmark period in the past is related to some financial crisis, and it is discussed whether we can learn from the environment that existed then. Such is the case of the financial crisis of 2008–9 and whether credit conditions today are similar, or not, to those just prior to that crisis. One metric that I have found useful in comparing credit market conditions over time is our Z-score models. Was the average (or median) firm creditworthiness better, worse or about the same in, say, 2016 compared with 2007? One might have some priors based on related macro- or micro-observations, such as cash on the balance sheet, interest rates or GDP growth. A more holistic, objective measure, in my opinion, is one based on default probabilities that consider multiple attributes, such as the Z-scores of relevant samples of firms in the two periods.

Table 9 shows the average and median Z- and Z''-scores for a large sample of high-yield bond issuers in 2007 and 2016, with some intermediate years between the two periods. We find these comparisons extremely helpful in clarifying certain conclusions based on the qualitative or quantitative opinions of some experts. The average Z-score was 1.95 (B+ BRE) in 2007 and 1.97 (also B+ BRE) in 2016 (3Q), and the median score was actually higher in 2007 (1.84) than in 2016 (1.70). The average and median Z''-scores, a measure that is probably more appropriate given that the high-yield firms in both periods came from many different industrial sectors (see our discussion earlier about Z versus Z''), were both higher in 2007

than in 2016. Tests of the means between 2007 and 2016 showed that they were insignificantly different, so our conclusion is that the average credit profile of risky debt-issuing firms was about the same in 2007 and 2016. I leave it up to the reader to determine if this was good or bad news for default estimates in 2017 and beyond.

13 PREDICTING DEFAULTS IN SPECIFIC SECTORS

Over time, default cycles have produced carnage in one or more industrial sectors. If this has persisted for several years, these sectors have tended to draw the particular attention of researchers and practitioners. Hence, the textile industry model (Altman *et al* 1974), the broker-dealer model (Altman and Lorris (1976), US airlines (Altman and Gritta 1984) and most recently the US energy and mining sectors have motivated specific analyses and tests.

A recent empirical test (Altman and Kuehne 2017 (updated)) of Z -score models analyzed this score's accuracy in the energy and mining sectors. Rather than build a model based on energy firm data only, we decided to assess both the Z - and Z'' -score models on a sample of bankruptcies in 2015, 2016 and 2017, a period in which energy-related firms accounted for more than half of the total defaults. Table 10 shows the results of just the bankruptcies, ie, type I accuracy, for two periods prior to the filing of the thirty-one firms with data available for a Z -score test as well as the larger number of firms (fifty-four) with data available for the Z'' -score test. Our results were quite impressive, especially for the Z -score model, which we built, as noted earlier, based only on manufacturing firm data. Indeed, 84% of the energy and mining companies had Z -scores in the D-rated zone (defaulted BRE) based on data from one or two quarters prior to the filing, and the remaining five firms in the sample had a CCC or B— BRE. For data from five or six quarters prior to filing, the results were still impressive, with 55% in the D-rated BRE zone and most of the remaining firms at CCC, ie, only two out of the thirty-one firms had a B+ BRE. While the results for the Z'' -score model were not as accurate – 75% had a D-rated BRE and the remaining firms had at most a B-rated BRE, based on data from the last quarter prior to filing for bankruptcy – they were still impressive and quite accurate.⁶

So, it appears that our original Z - and Z'' -score models retain their high accuracy level for distress prediction, even for some industries that were not included in our original tests. However, we are not able to generalize our results to cover all nonmanufacturers, especially service firms.

⁶ We have also tested our models for the type II error. Results show a reasonably high type II error, although the overall accuracy is still impressive. Note that the sample sizes are different for the comparison of Z and Z'' models.

TABLE 10 Applying the Z-score models to recent energy and mining company bankruptcies.

BREs	Z-score				Z''-score			
	$t - 1^*$		$t - 2^{**}$		$t - 1^*$		$t - 2^{**}$	
	#	%	#	%	#	%	#	%
A								
BBB+								
BBB								
BBB-								
BB+							1	2
BB							0	0
BB-							3	5
B+			2	6	1	2	1	2
B					3	5	13	24
B-					3	5	6	11
CCC+	5	16	12	39	1	2	8	15
CCC					2	4	8	15
CCC-					4	7	9	16
D	26	84	17	55	41	75	6	11
Total	31	100	31	100	55	100	55	100

13.1 Sovereign default risk

An intriguing application of the Z-score model is to use it to assess the default risk of sovereign nations' debt. We (Altman and Rijken 2011) were inspired by the World Bank's study (Pomerleano 1998), which analyzed the causes of the financial crisis in Southeast and East Asia in 1997–8. It found that the original Z-score model clearly demonstrated that the country that was most vulnerable to private sector defaults prior to the crisis was South Korea. Indeed, South Korea had the lowest average Z-score for listed firms out of all the Asian countries, but it was given a high investment grade by all of the rating agencies in December 1996. It needed to be bailed out by the International Monetary Fund shortly thereafter! This illustration inspired us, more than a decade later, to analyze sovereign default risk in a unique way.

The aggregation of Z-scores, or, in the case of Altman and Rijken (2011), a more up-to-date version called Z-metrics™, proved to be exceptionally accurate in predicting which European countries had the most serious financial problems post the 2008 crisis. Their bottom-up approach added a new micro-economic element to the arsenal of predictive measures for sovereign risk assessment that had never before been studied.

14 MANAGING A FINANCIAL TURNAROUND

One of the most interesting and important applications of the Z-score model, from an internal and active perspective, rather than the passive standpoint of a distressed firm, is using it to guide the successful turnaround of a firm. I suggested this application and wrote up a case study on the GTI Corporation (see Altman and LaFleur (1981); it can also be found in Altman and Hotchkiss (2006) and Altman *et al* (2019)). The idea is a simple one: if a model is effective in predicting bankruptcy, why would it not be helpful in the management of distressed firms, in identifying strategies and their impact on performance metrics? In the case of the GTI Corporation, the new CEO, James LaFleur, strategically simulated the impact of his management changes on the resulting Z-scores and only made those changes that resulted in an improved Z-score. His strategy did result in a remarkably successful turnaround. Here, again, was an application of the Z-score model that I had never considered until a practitioner suggested its use.

15 CONCLUSION

This paper has assessed the statistical and fundamental characteristics of the Altman (1968) Z-score model over the fifty years since its creation. In addition, I have listed a large number of proposed and experienced applications of the original Z-model as well as several subsequent ones, with a more detailed discussion on the specifics and importance of several of these applications. This fifty-year-old model has demonstrated an impressive resilience over the years and, notwithstanding massive growth in the size and complexity of global debt markets and corporate balance sheets, has not only exhibited longevity as an accurate predictor of corporate distress, but also shown that it can be successfully modified for a number of applications beyond its original focus. The list, shown in Table 8, is almost assuredly incomplete, especially in view of the large number of scholarly works that have cited Z-score models for a wide range of empirical research investigations. While I am surprised at the longevity of the Z-score models' usefulness, I cannot help but wonder what some analysts might conclude in the year 2068 about its 100-year track record.

DECLARATION OF INTEREST

The author reports no conflicts of interest. The author alone is responsible for the content and writing of the paper.

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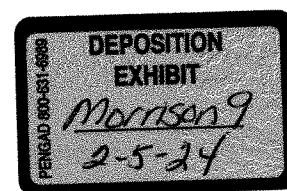
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Financial Ratios and the Probabilistic Prediction of Bankruptcy

JAMES A. OHLSON*

1. Introduction

This paper presents some empirical results of a study predicting corporate failure as evidenced by the event of bankruptcy. There have been a fair number of previous studies in this field of research; the more notable published contributions are Beaver [1966; 1968*a*; 1968*b*], Altman [1968; 1973], Altman and Lorriss [1976], Altman and McGough [1974], Altman, Haldeman, and Narayanan [1977], Deakin [1972], Libby [1975], Blum [1974], Edmister [1972], Wilcox [1973], Moyer [1977], and Lev [1971]. Two unpublished papers by White and Turnbull [1975*a*; 1975*b*] and a paper by Santomero and Vinso [1977] are of particular interest as they appear to be the first studies which logically and systematically develop probabilistic estimates of failure. The present study is similar to the latter studies, in that the methodology is one of maximum likelihood estimation of the so-called conditional logit model.

The data set used in this study is from the seventies (1970–76). I know of only three corporate failure research studies which have examined data from this period. One is a limited study by Altman and McGough [1974] in which only failed firms were drawn from the period 1970–73 and only one type of classification error (misclassification of failed firms) was analyzed. Moyer [1977] considered the period 1965–75, but the sample of bankrupt firms was unusually small (twenty-seven firms). The

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third study, by Altman, Haldeman, and Narayanan [1977], which “updates” the original Altman [1968] study, basically considers data from the period 1969 to 1975. Their sample was based on fifty-three failed firms and about the same number of nonfailed firms. In contrast, my study relies on observations from 105 bankrupt firms and 2,058 nonbankrupt firms. Although the other three studies differ from the present one so far as methodology and objectives are concerned, it is, nevertheless, interesting and useful to compare their results with those presented in this paper.

Another distinguishing feature of the present study which I should stress is that, contrary to almost all previous studies, the data for failed firms were not derived from *Moody's Manual*.¹ The data were obtained instead from 10-K financial statements as reported at the time. This procedure has one important advantage: the reports indicate at what point in time they were released to the public, and one can therefore check whether the company entered bankruptcy prior to or after the date of release. Previous studies have not explicitly considered this timing issue. Some studies, but by no means all, seem implicitly to presume that a report is available at the fiscal year-end date. The latter may or may not be appropriate, depending on the purpose of the study. However, if the purpose is one of investigating pure forecasting relationships, as is the case in this study, then the latter procedure is inadequate. This follows because it is possible that a company files for bankruptcy at some point in time after the fiscal year date, but prior to releasing the financial statements. This is not a trivial problem and neglecting this possibility may lead to “back-casting” for many of the failed firms.

The major findings of the study can be summarized briefly. First, it was possible to identify four basic factors as being statistically significant in affecting the probability of failure (within one year). These are: (i) the size of the company; (ii) a measure(s) of the financial structure; (iii) a measure(s) of performance; (iv) a measure(s) of current liquidity (the evidence regarding this factor is not as clear as compared to cases (i)–(iii)). Second, previous studies appear to have overstated the predictive (in the sense of forecasting) power of models developed and tested. The point of concern is the one alluded to above, that is, if one employs predictors derived from statements which were released after the date of bankruptcy, then the evidence indicates that it will be easier to “predict” bankruptcy. However, even if one allows for this factor, for the sample of firms used in this study, the prediction error-rate is larger in comparison to the rate reported in the original Altman [1968] study as well as most other studies using data drawn from periods prior to 1970. More important, the prediction error-rate is also larger than the one reported in Altman et al. [1977]. On the other hand, the Altman and McGough [1974]

¹ The only exception appears to be the Altman and McGough [1974] study. Altman et al. [1977] do not describe how they derived their data.

and Moyer [1977] studies report significantly larger error-rates, which are comparable to those found in this study. I have not been able completely to account for this most significant difference in the error-rates reported here, in Altman and McGough [1974], and in Moyer [1977], as compared to Altman et al. [1977]. (Any period dependence should after all be relatively minor.)

The model(s) are relatively simple to apply and may be of use in practical applications. The data requirements are such that all of the predictors are easily retrieved from the *Compustat* file. A potential disadvantage is that the model does not utilize any market transactions (price) data of the firms. One may, of course, expect that the predictive power of the model could be enhanced by incorporating such data.²

However, one might ask a basic and possibly embarrassing question: why forecast bankruptcy? This is a difficult question, and no answer or justification is given here. It could, perhaps, be argued that we are dealing with a problem of “obvious” practical interest. This is questionable since real-world problems concern themselves with choices which have a richer set of possible outcomes. No decision problem I can think of has a payoff space which is partitioned naturally into the binary status bankruptcy versus nonbankruptcy. (Even in the case of a “simple” loan decision, the payoff configuration is much more complex.) Existing empirical studies reflect this problem in that there is no consensus on what constitutes “failure,” with definitions varying significantly and arbitrarily across studies. In other words, the dichotomy bankruptcy versus no bankruptcy is, at the most, a very crude approximation of the payoff space of some hypothetical decision problem. It follows that it is essentially a futile exercise to try to establish the relative decision usefulness of alternative predictive systems. Accordingly, I have not concerned myself with how bankruptcy (and/or failure) “ought” to be defined; I also have refrained from making inferences regarding the relative usefulness of alternative models, ratios, and predictive systems (e.g., univariate versus multivariate). Most of the analysis should simply be viewed as descriptive statistics—which may, to some extent, include estimated prediction error-rates—and no “theories” of bankruptcy or usefulness of financial ratios are tested. Even so, there are a large number of difficult statistical and methodological problems which need to be discussed. Many important problems pertaining to the development of data for bankrupt firms have gone mostly unnoticed in the literature.

2. Some Comments Regarding Methodology and Data Collection

The econometric methodology of conditional logit analysis was chosen to avoid some fairly well known problems associated with Multivariate

² I am currently undertaking work in this direction. I should note further that the use of price data implicitly is another way of using more information. Hence, it can also be viewed as another way of indirect use of accounting data.

Discriminant Analysis (*MDA*, for short). The *MDA* approach has been the most popular technique for bankruptcy studies using vectors of predictors. Among some of the problems with these studies are:³ (i) There are certain statistical requirements imposed on the distributional properties of the predictors. For example, the variance-covariance matrices of the predictors should be the same for both groups (failed and nonfailed firms); moreover, a requirement of normally distributed predictors certainly mitigates against the use of dummy independent variables. A violation of these conditions, it could perhaps be argued, is unimportant (or simply irrelevant) if the only purpose of the model is to develop a discriminating device. Although this may be a valid point, it is nevertheless clear that this perspective limits the scope of the investigation. Under many circumstances, it is of interest to go through more traditional econometric analysis and test variables for statistical significance, etc. (ii) The output of the application of an *MDA* model is a score which has little intuitive interpretation, since it is basically an ordinal ranking (discriminatory) device. For decision problems such that a misclassification structure is an inadequate description of the payoff partition, the score is not directly relevant.⁴ If, however, prior probabilistics of the two groups are specified, then it is possible to derive posterior probabilities of failure. But, this Bayesian revision process will be invalid or lead to poor approximations unless the assumptions of normality, etc. are satisfied. (iii) There are also certain problems related to the "matching" procedures which have typically been used in *MDA*. Failed and nonfailed firms are matched according to criteria such as size and industry, and these tend to be somewhat arbitrary. It is by no means obvious what is really gained or lost by different matching procedures, including no matching at all. At the very least, it would seem to be more fruitful actually to include variables as predictors rather than to use them for matching purposes.

The use of conditional logit analysis, on the other hand, essentially avoids all of the problems discussed with respect to *MDA*. The fundamental estimation problem can be reduced simply to the following statement: given that a firm belongs to some prespecified population, what is the probability that the firm fails within some prespecified time period? No assumptions have to be made regarding prior probabilities of bankruptcy and/or the distribution of predictors. These are the major advantages. The statistical significance of the different predictors are obtained from asymptotic (large sample) theory. To be sure, as is the case in any parametric analysis, a model must be specified, so there is always room for misspecification of the basic probability model. (Al-

³ See also Eisenbeis [1977] and Joy and Tollefson [1975] for extensive discussions.

⁴ The payoff partition will be inadequate if it is not feasible to define a utility function over the two types of classification errors. Any economic decision problem would typically require a richer state partition.

though it is possible to test for misspecification, it is beyond the confines of this paper to discuss and report on the results of such tests.)

Regardless of the virtues of probabilistic prediction over *MDA*, there are important problems with respect to data collection of bankrupt firms which deserve preliminary discussion. This matter was alluded to in the introduction. Realistic evaluation of a model's predictive relationships requires that the predictors are (would have been) available for use prior to the event of failure. Now, it is of course true that annual reports are not publicly available at the end of the fiscal year, since the financial statements must be audited. Previous studies have not mentioned this problem, at least not explicitly. This is not surprising since most previous studies have used *Moody's Manual* to derive the pertinent financial ratios, and the *Manual* does not indicate at what point in time the data were made available. Another reason is that not all studies have been concerned with strict forecasting relationships. That is, whether accounting statements were publicly available or not had no direct bearing upon the subject at hand. One such case is Beaver [1968*a*; 1968*b*], who studied whether financial ratios will reflect impending failure. The timing issue can be expected to be serious for firms which have a large probability of failure in the first place. Such firms are in poor shape and the auditing process could be particularly problematic and time-consuming. Thus, it is somewhat risky to assume that financial reports were available, say, three months after the end of the fiscal year. There are other disadvantages associated with *Moody's Manual*. The data are often highly condensed, and it is generally complicated, if not impossible, to reconstruct actual balance sheets and income statements.⁵ Again, firms which are in poor shape are particularly difficult, since one can never be sure whether some of the many possible special items have been given special treatment in *Moody's* tabulation.⁶ Moreover, it should be noted that the comparative schedules over the different years are ex-post reconstructions, and items from previous years may have been restated and may differ from the amounts originally reported. At a nontrivial cost, this problem can be circumvented if one uses several annual editions of *Moody's* for the same firm.

Clearly, much can be gained by improving the data base. The evaluation of the predictive classification power of a model should be more realistic, and, more important here, the same should apply for standard tests of statistical significance. This is not to suggest that it is important to have "super accurate" data for purposes of developing (as opposed to evaluating) a discriminatory device. It might well be that the predictive quality of any model is reasonably robust across a variety of data-gathering and estimating procedures.

⁵ The conclusion is based on a few "case studies."

⁶ The summaries of taxes (loss carry-forward, in particular) and measures of operating performance appear to be the most difficult items to deal with.

3. *Collection of Financial Statement Data*

The collection of data for bankrupt firms requires a definition of failure and specification of the population from which firms are drawn. In this study, the definition is purely legalistic. The failed firms must have filed for bankruptcy in the sense of Chapter X, Chapter XI, or some other notification indicating bankruptcy proceedings.⁷ The population boundaries are restricted by: (i) the period from 1970 to 1976; (ii) the equity of the company had to have been traded on some stock exchange or over-the-counter (*OTC*) market; (iii) the company must be classified as an industrial. The first criterion was chosen simply because it is the most recent period, and the cutoff point of 1970 was selected as a matter of practicality. The second criterion excludes small or privately held corporations. This is crucial, since otherwise the use of *Compustat* firms as a source of nonbankrupt firms would be precluded. The third criterion excludes utilities, transportation companies, and financial services companies (banks, insurance, brokerage, REITs, etc.). Companies in these industries are structurally different, have a different bankruptcy environment, and appropriate data are, in some cases, difficult to obtain.

The following procedures were used to generate a list of failed firms satisfying the inclusion criteria. (1) A primary listing of failed firms was tabulated from the *Wall Street Journal Index* (*W.S.J.I.*). Type and date of bankruptcy were recorded. If the name of the company indicated that the firm in question was a nonindustrial, then it was excluded. (2) A secondary listing of firms was tabulated by excluding all firms on the primary listing which had not been traded on one of the stock exchanges (or *OTC*) during the three-year period prior to the date of bankruptcy. If a company could be traced to one of the exchanges, then the exchange was recorded. This kind of information was derived from various stock guides issued by *Moody's* and *Standard and Poor's*. Of course, as a practical matter, it was assumed that a stock had not been traded if no evidence could be found to that effect. (3) Attempts were made to augment the secondary listing by examining other miscellaneous sources of data. This led to some relatively minor additions to the listing of bankrupt firms. However, in tracing bankrupt firms it seemed to me that very few firms were omitted from the *W.S.J.I.*, so long as the firms satisfied the inclusion criteria.

The next phase was one of actually collecting financial data for the bankrupt firms. The objective was to obtain three years of data prior to the date of bankruptcy. Each report had to include the balance sheet, income statement, funds statement, and the accountants' report. In case the last available accountants' report explicitly stated that the company had filed for bankruptcy, then a fourth report was collected. All reports were retrieved from the Stanford University Business School Library,

⁷ See Altman [1971] for a discussion of the difference between different types of bankruptcy proceedings.

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TABLE 1
Bankrupt Firms: Year, Type of Bankruptcy, and Exchange Listing

Type	Year							Totals
	1970	1971	1972	1973	1974	1975	1976	
Chapter X	0	2	2	1	1	0	0	6
Chapter XI	1	4	14	20	18	14	14	85
Other or unknown	0	0	5	6	0	1	2	14
Totals	1	6	21	27	19	15	16	105
New York Stock Exchange								8
American Stock Exchange								43
Other*								54

* Over-the-counter market or regional exchange.

which has an extensive microfilm file of 10-K reports. The relevant parts of the 10-K reports were photocopied and subsequently coded. Some firms had to be deleted from the sample because no report whatsoever was available, but these were few. Other firms, again very few, were deleted because they were corporate shells and had no sales. On the other hand, no firm was deleted because of its young (exchange) age, and some firms had only one set of reports.

In the process of coding items from the annual reports, I noted that all but one firm which went bankrupt in 1970, and some of the 1971 firms, had no funds statement in their annual report. This was not true for firms which filed for bankruptcy in subsequent years. Similar observations are applicable for firms on the *Compustat* file, although omissions were much less frequent. The SEC did not require a funds statement until the early seventies.⁸ I decided that firms without a funds statement should be deleted, since it would have been impossible otherwise to use ratios derived from the funds statement.

The final sample was made up of 105 bankrupt firms. Basic information regarding year, exchange, and type of bankruptcy is given in table 1. As one would suspect, relatively few firms were listed on the NYSE, compared to the other two categorizations. Furthermore, Chapter XI bankruptcy was apparently much more frequent than Chapter X.

I noted that while eighteen of the 105 firms (17 percent) had accountants' reports which disclosed that the company had entered bankruptcy, the fiscal year-end was prior to the date of bankruptcy. These reports were deleted and reports from the previous fiscal year were substituted. As a consequence, the average lead time between the date of the fiscal year of the last relevant report and bankruptcy is quite long, approximately thirteen months. Table 2 shows the entire frequency distribution. This lead time is quite a bit longer, compared to what has been reported in previous studies. A cursory review of the data indicated that the time lag between the fiscal year-end and the date of the accountants' report

⁸ Funds statements have been required since September 30, 1971; see *APB opinion No. 19*.

TABLE 2
*Lead Times of Last Set of Annual Reports (Not Indicating Bankruptcy) Prior to Bankruptcy**

Months	3	3.5	4.5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5
Number of Reports	2	1	1	1	3	4	5	2	2	4	2	4	3	4	4	7	3	2	2	2	3	8	5	4
Months	16	16.5	17	17.5	18	18.5	19.5	20	20.5	21.5	23	23.5	25	26	27.5	28	33.5							
Number of Reports	4	4	3	1	1	1	1	1	2	1	1	1	1	2	1	1	1							

* Mean: 13 months; mode: 14.5 months; median: 12.5 months.

can be quite long. In fact, for the group of eighteen firms, the lag was always longer in the year which was closer to bankruptcy. The following example is reasonably representative. Hers Apparel Ind. filed for bankruptcy May 31, 1974; the accountants' report for the fiscal year-end February 28, 1974 is dated July 19, 1974. In the previous year, the report was dated April 24, 1973. Note that the lead time between fiscal year date of last "relevant" report and date of bankruptcy is approximately thirteen months in this case (i.e., April 24, 1973 to May 31, 1974). In 1974, it took approximately four and one-half months to complete the audit. (I found many cases which exceeded four and one-half months.) There were also a number of firms for which additional relevant reports could have existed. Under such circumstances, search procedures were attempted, but with little success. For most of these cases, it appears as if the firms simply never filed any additional reports with the S.E.C. This is by no means implausible, since firms can apply for extension of their deadline, and after bankruptcy has actually occurred there may simply be no point in going through an audit and preparing a standard annual report. Of course, it is also possible that additional reports did exist, but never got to the Stanford University Library. In order to play it "safe," I decided that no firm was to be deleted because reports were potentially missing. As a consequence, any evaluation of a model based on this data set probably understates the predictive classification performance.

A sample of nonbankrupt firms was obtained from the *Compustat* tape. Ideally, all reports for all firms satisfying the population constraints should have been included as a control sample. However, this was deemed to be too costly and impractical (due to core memory constraints). I decided instead that every firm on the *Compustat* tape (excluding utilities, etc.) should contribute with only one vector of data points; the year of any given firm's report was obtained by random procedure. This led to 2,058 vectors of data points for nonbankrupt firms. The breakdown into exchange listings was as follows: New York Stock Exchange = 42%, American Stock Exchange = 32%, Other = 26%.

4. A Probabilistic Model of Bankruptcy

Let \mathbf{X}_i denote a vector of predictors for the i th observation; let β be a vector of unknown parameters, and let $P(\mathbf{X}_i, \beta)$ denote the probability of bankruptcy for any given \mathbf{X}_i and β . P is some probability function, $0 \leq P \leq 1$. The logarithm of the likelihood of any specific outcomes, as reflected by the binary sample space of bankruptcy versus nonbankruptcy, is then given by:

$$l(\beta) \equiv \sum_{i \in S_1} \log P(\mathbf{X}_i, \beta) + \sum_{i \in S_2} \log(1 - P(\mathbf{X}_i, \beta)),$$

where S_1 is the (index) set of bankrupt firms and S_2 is the set of

nonbankrupt firms. For any specified function P , the maximum likelihood estimates of $\beta_1, \beta_2 \dots$, are obtained by solving:

$$\max_{\beta} l(\beta).$$

In the absence of a positive theory of bankruptcy, there is no easy solution to the problem of selecting an appropriate class of functions P . As a practical matter, all one can do is to choose on the basis of computational and interpretative simplicity. One such function is the logistic function:

$$P = (1 + \exp\{-y_i\})^{-1}, \quad \text{where } y_i \equiv \sum_j \beta_j X_{ij} = \beta' \mathbf{X}_i.$$

There are two implications which should be mentioned. First, P is increasing in y ; second, y is equal to $\log[P/(1 - P)]$. The model is thus relatively easy to interpret, and this is its main (and perhaps only) virtue.⁹

5. Ratios and Basic Results

For purposes of the present report, no attempt was made to develop any "new or exotic" ratios. The criterion for choosing among different predictors was simplicity. The first three models estimated, Models 1-3, were composed of an intercept and the following nine independent variables:¹⁰

1. *SIZE* = $\log(\text{total assets}/\text{GNP price-level index})$. The index assumes a base value of 100 for 1968. Total assets are as reported in dollars. The index year is as of the year prior to the year of the balance sheet date. The procedure assures a real-time implementation of the model. The log transform has an important implication. Suppose two firms, *A* and *B*, have a balance sheet date in the same year, then the sign of $P_A - P_B$ is independent of the price-level index. (This will not follow unless the log transform is applied.) The latter is, of course, a desirable property.
2. *TLTA* = Total liabilities divided by total assets.
3. *WCTA* = Working capital divided by total assets.
4. *CLCA* = Current liabilities divided by current assets.
5. *OENEG* = One if total liabilities exceeds total assets, zero otherwise.
6. *NITA* = Net income divided by total assets.
7. *FUTL* = Funds provided by operations divided by total liabilities.

⁹ See McFadden [1973] for a comprehensive analysis of the logit model.

¹⁰ No attempt was made to select predictors on the basis of rigorous theory. To put it mildly, the state of the art seems to preclude such an approach. (The first six predictors were partially selected simply because they appear to be the ones most frequently mentioned in the literature.)

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8. *INTWO* = One if net income was negative for the last two years, zero otherwise.
9. *CHIN* = $(NI_t - NI_{t-1}) / (|NI_t| + |NI_{t-1}|)$, where NI_t is net income for the most recent period. The denominator acts as a level indicator. The variable is thus intended to measure change in net income. (The measure appears to be due to McKibben [1972]).

Previous studies, "common sense," and perhaps even theory, would suggest that the sign of the coefficients of the different ratios should be as follows:

Positive	Negative	Indeterminate
<i>TLTA</i>	<i>SIZE</i>	<i>OENEG</i>
<i>CLCA</i>	<i>WCTA</i>	
<i>INTWO</i>	<i>NITA</i>	
	<i>FUTL</i>	
	<i>CHIN</i>	

OENEG serves as a discontinuity correction for *TLTA*. A corporation which has a negative book value is a special case. Survival would tend to depend upon many complicated factors, and the effect of the extreme leverage position needs to be corrected. A positive sign would suggest almost certain bankruptcy, while a negative sign suggests that the situation is very bad indeed (due to *TLTA*), but not *that* bad. (Granted, this is a very heuristic procedure to capture something very complicated.)

A "profile" analysis of the data supports the hypotheses regarding the signs. Table 3 shows the means and standard deviations of the predictors for three sets of data: one year prior to bankruptcy, nonbankruptcy firms, and two years prior to bankruptcy. The results are hardly surprising. The ratios deteriorate as one moves from nonbankrupt firms to two years prior to bankruptcy to one year prior to bankruptcy. Although the data

TABLE 3
Profile Analysis

Variable	One Year Prior to Bankruptcy		Nonbankrupt Firms		Two Years Prior to Bankruptcy	
	mean	stdv	mean	stdv	mean	stdv
<i>SIZE</i>	12.134	1.38	13.26	1.570	12.234	1.414
<i>TLTA</i>	0.905	0.637	0.488	0.181	0.718	0.311
<i>WCTA</i>	0.041	0.608	0.310	0.182	0.157	0.320
<i>CLCA</i>	1.32	2.52	0.525	0.740	0.814	0.671
<i>NITA</i>	-0.208	0.411	0.0526	0.0756	-0.052	0.155
<i>FUTL</i>	-0.117	0.421	0.2806	0.360	-0.0096	0.332
<i>INTWO</i>	0.390	0.488	0.0432	0.2034	0.180	0.384
<i>OENEG</i>	0.18	0.385	0.0044	0.0660	0.060	0.237
<i>CHIN</i>	-0.322	0.644	0.0379	0.458	0.00308	0.8673
<i>N</i>	105		2,058		100	

and ratios are not quite comparable with those of Beaver [1966], the results here are quite similar to the profiles he presented [1966, p. 82]. It should also be noted that the standard deviations of the predictors (except for size) are larger for year-1 firms, compared to nonbankrupt firms. These differences are significant at a 5-percent level or better. Hence, as discussed in Section 2, standard assumptions of *MDA* are unlikely to be valid.

Three sets of estimates were computed for the logit model using the predictors previously described. Model 1 predicts bankruptcy within one year; Model 2 predicts bankruptcy within two years, given that the company did not fail within the subsequent year; Model 3 predicts bankruptcy within one or two years. A summary of the results are shown in table 4. This table indicates that all of the signs were as predicted for Model 1. Only three of the coefficients (*WCTA*, *CLCA*, and *INTWO*) have *t*-statistics less than two, so the others are all statistically significant at a respectable level. This includes *SIZE*, which has a relatively large *t*-statistic. An overall measure of goodness-of-fit is given by the likelihood ratio index. The index is similar to a R^2 in the sense that it equals one in case of a perfect fit, and zero if the estimated coefficients are zero.¹¹ For Model 1, the ratio is 84 percent, and this is significant at an extremely low α -level. The statistic "Percent Correctly Predicted" equals 96.12 percent; it is tabulated on the basis of a cutoff point of .5. That is, classify the company if and only if $P(\mathbf{X}_i, \hat{\beta}) > 0.5$. Whether this is a "good" or "bad" result is not easy to answer at this stage, so further discussion regarding the model's predictive power is postponed until the next section. At this point, we can note that if all firms were classified as nonbankrupt, then 91.15 percent would be correctly classified ($2,058/(105 + 2,058)$). Thus the marginal (unconditional, prior) probability of bankruptcy is an important quantity in the above type of statistic. Further, there is no apparent reason why .5 is an appropriate cutoff point, since it presumes implicitly that the loss function is symmetric across the two types of classification errors.

Table 5 shows the correlation coefficients of the estimation errors in Model 1. The coefficients of the financial state variables (variables 1–4 in the table) are uncorrelated with those of the performance variables (variables 5–9). Hence, both sets of variables contribute significantly and independently of each other to the likelihood function. This strongly supports the contention that both sets of variables are important in establishing the predictive relationship.

Models 2 and 3 have somewhat weaker goodness-of-fit statistics, which

¹¹ The likelihood ratio index is defined to be:

$$1 - \log \text{likelihood at convergence} / \log \text{likelihood at zero.}$$

The index will take on the value of one in case of a perfect fit, since log likelihood at convergence then equals zero. If there is no fit, then obviously the index equals zero. See McFadden [1973] for further details.

TABLE 4
Prediction Results

	Variable									
	SIZE	TLTA	WCTA	CLCA	NITA	FUTL	INTWO	OENEG	CHIN	CONST
<i>Model 1</i>										
Estimates	-.407	6.03	-1.43	.0757	-2.37	-1.83	0.285	-1.72	-.521	-1.32
t-statistics	-3.78	6.61	-1.89	.761	-1.85	-2.36	.812	-2.450	-2.21	-.970
<i>Model 2</i>										
Estimates	-.519	4.76	-1.71	-.297	-2.74	-2.18	-.780	-1.98	.4218	1.84
t-statistics	-5.34	5.46	-1.78	-.733	-1.80	-2.73	-1.92	-2.42	2.10	1.38
<i>Model 3</i>										
Estimates	-.478	5.29	-.990	0.062	-4.62	-2.25	-.521	-1.91	.212	1.13
t-statistics	-6.23	7.72	-1.74	.738	-3.60	-3.42	-1.73	-3.11	1.30	1.15

	Likelihood Ratio Index	Percent Correctly Predicted
Model 1	0.8388	96.12
Model 2	0.7970	95.55
Model 3	0.719	92.84

TABLE 5
Correlation Matrix of (Estimated) Estimation Errors in Model 1

	SIZE	TLTA	WCTA	CLCA	OENEG	NITA	FUTL	INTWO	CHIN
SIZE	1	-.28	*	*	*	*	*	*	*
TLTA		1	.32	*	-.49	*	*	*	*
WCTA			1	.46	*	*	*	*	*
CLCA				1	*	*	*	*	*
OENEG					1	*	*	*	*
NITA						1	-.41	.40	-.44
FUTL							1	*	*
INTWO								1	-.32
CHIN									1

* = Absolute value of coefficient less than .20.

is exactly what one would expect in view of the profile analysis. Note also that the signs of *INTWO* and *CHIN* differ from those of Model 1. The positive and significant coefficient for *CHIN* in Model 2 can perhaps be explained by a scenario proposed by Deakin [1972]. Firms with a positive change in earnings may be particularly tempted to raise external capital through borrowing, and this will then imply that they become higher-risk firms at a subsequent point. Of course, this is only one possible explanation and the evidence is far too weak even vaguely to suggest that it is in fact the case.

In all three models, size appears as an important predictor. This finding is consistent with Horrigan's [1968] study of bond ratings, wherein he too found that size was an important determinant. One could perhaps argue that the conclusion is invalid because the bankrupt and nonbankrupt firms are drawn from different populations. Specifically, one cannot be sure that all the nonbankrupt firms would have been on the *Compustat* tape if they had not failed.¹² No direct test of the problem is therefore feasible. The *Compustat* tape is heavily biased toward the relatively large firms listed on the two major exchanges. If size is a spurious variable, then it is likely that dummy variables reflecting exchange listings are more important than size. This test was implemented, and the results are shown in table 6. The *t*-statistic for *SIZE* is larger than two, whereas the two exchange dummies NYSE and AMSE are essentially insignificant. These results again support the contention that size is an important predictor of bankruptcy. Even so, the test and conclusion must be viewed with great caution, since *Compustat* firms are different from non-*Compustat* firms on a number of complex dimensions. Therefore, we cannot be sure that size is a surrogate which is superior to exchange listing. If size, in fact, is a superior surrogate, then the statistical significance of size may simply reflect a general *Compustat* bias.¹³

¹² The *Compustat* file does not include all firms which have (or have had) their equity traded.

¹³ It would have been preferable to obtain data for nonbankrupt firms by sampling 10-K reports from the Stanford Library. However, this would have been a very costly procedure.

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TABLE 6
Model 4

Variable	Estimates	<i>t</i> -Statistics
<i>SIZE</i>	-.267	-2.02
<i>TLTA</i>	5.63	6.04
<i>WCTA</i>	-1.43	-1.91
<i>CLCA</i>0585	.595
<i>NITA</i>	-2.35	-1.82
<i>FUTL</i>	-1.99	-2.53
<i>INTWO</i>307	.877
<i>OENEG</i>	-1.56	-2.20
<i>CHIN</i>	-.5092	-2.15
<i>NYSE</i>	-.854	-1.71
<i>AMSW</i>	-.0513	-.186
<i>CONST</i>	-2.63	-1.70
Percent Correctly Predicted		96.30%
Likelihood Ratio Index8399

Subject to the qualification above, the results indicate that the four factors derived from financial statements which are statistically significant for purposes of assessing the probability of bankruptcy are: (i) size (*SIZE*); (ii) the financial structure as reflected by a measure of leverage (*TLTA*); (iii) some performance measure or combination of performance measures (*NITA* and/or *FUTL*); (iv) some measure(s) of current liquidity (*WCTA* or *WCTA* and *CLCA* jointly).¹⁴ In an attempt to determine whether other factors can be obtained from financial statements which could increase the predictability of failure, I estimated an additional model. This model was Model 1 supplemented by a measure of profit margin, computed as funds from operations divided by sales, and a ratio of assets with little or no cash value (intangibles plus deferred assets) divided by total assets. The estimation results showed not only that both of these variables were completely insignificant, but also that the estimated coefficients had "incorrect" signs. (The *t*-statistics were .14 and -.42, respectively.) Whether other accounting predictors could have done a better job in improving upon the likelihood function is not clear, but, in my view, it is not overly likely.¹⁵ On the other hand, nonaccounting data, such as information based on equity prices and changes in prices might prove to be most useful. I intend to test these kinds of models once adequate data have been gathered.

¹⁴ If *CLCA* is deleted in the equation estimated, then the *t*-statistic of *WCTA* is slightly greater than two. For all practical purposes, this will be the only difference.

¹⁵ One possible exception would be measures of "trends" of ratios and/or volatility of ratios (and performance measures). Due to the considerable costs of gathering and organizing data, such a refinement was judged to be cost-benefit inefficient.

6. *Evaluation of Predictive Performance*

There is no way one can completely order the predictive power of a set of models used for predictive (decision) purposes. As a minimum, this requires a complete specification of the decision problem, including a preference structure defined over the appropriate state-space. Previous work in the area of bankruptcy prediction has generally been based on two highly specific and restrictive assumptions when predictive performance is evaluated. First, a (mis)classification matrix is assumed to be an adequate partition of the payoff structure. Second, the two types of classification errors have an additive property, and the "best" model is one which minimizes the sums of percentage errors. Both of these assumptions are arbitrary, although it must be admitted that the first assumption is of some value if one is to describe at least one implication of using a model. Much of this discussion will therefore focus on such a (mis)classification description. Nevertheless, the second assumption will also be used at some points, since it would otherwise be impossible to compare the results here with those of previous studies. The comparison cannot be across models because the time periods, predictors, and data sets are different. Rather, the question of interest is one of finding to what extent the results conform with each other.

Without loss of generality, one may regard the estimated probability of failure, $P(\mathbf{X}_i, \hat{\beta})$, as a signal which classifies firm i into one of the two groups. Hence, it is of interest to describe the conditional distributions of these signals. Figure 1 shows the empirical frequency of $P(\mathbf{X}_i, \hat{\beta})$ for the 105 firms which failed within a year; $\hat{\beta}$ is the vector of estimated coefficients obtained from Model 1. Figure 2 shows the frequency for the 2,058 nonfailed firms where $\hat{\beta}$ is again taken from Model 1. Figure 3 shows the probabilities for 100 firms two periods prior to bankruptcy; the β 's

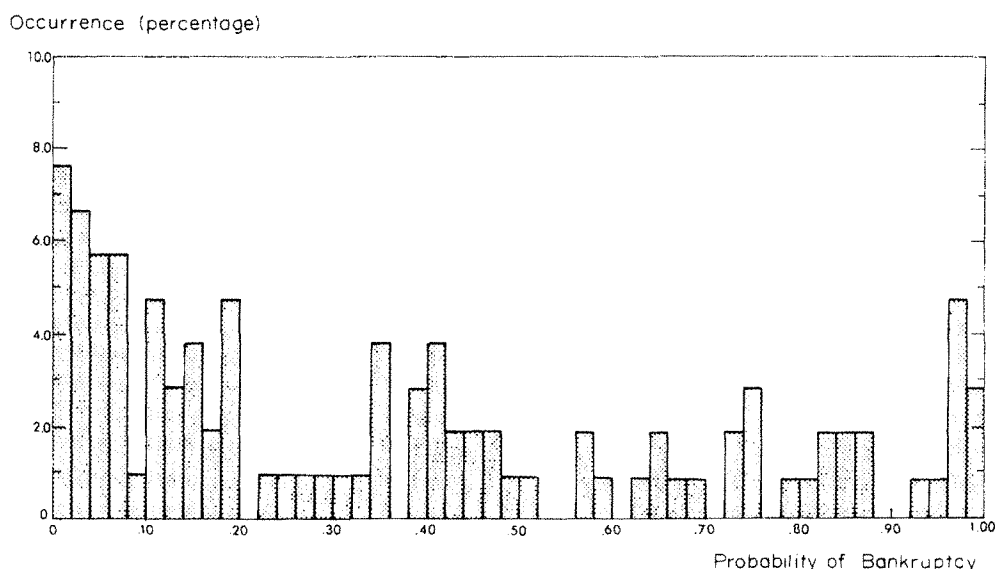


FIG. 1.—Firms one year prior to bankruptcy (105 firms)

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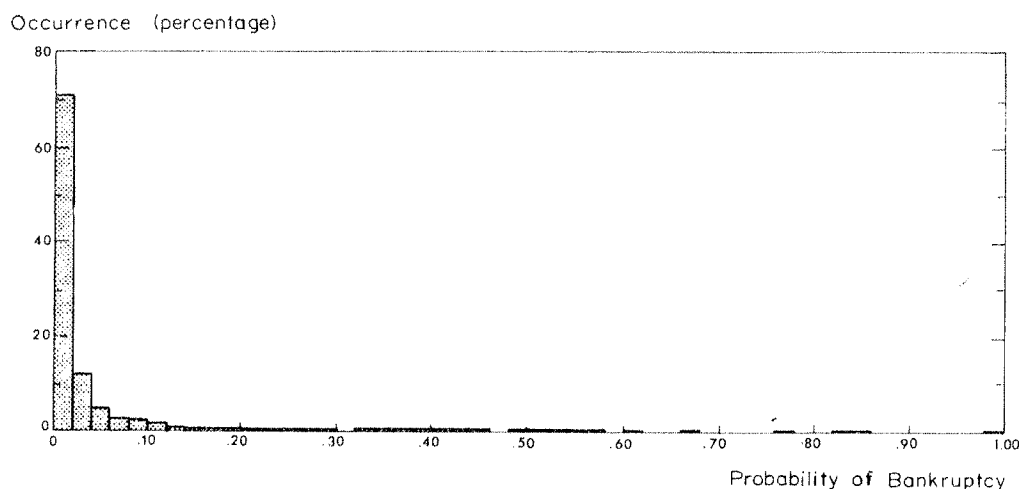


FIG. 2.—Nonbankrupt firms (2,058 firms)

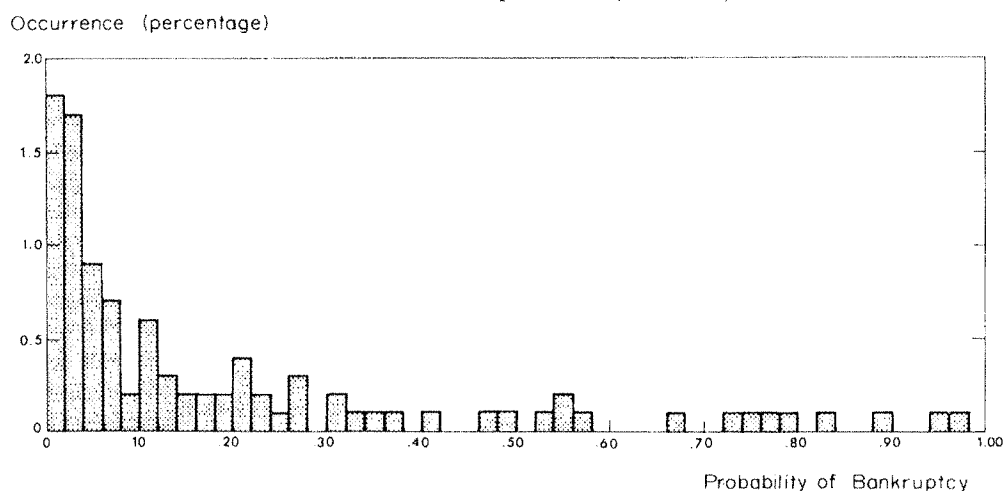


FIG. 3.—Firms two years prior to bankruptcy (100 firms)

were taken from Model 2. The mean probabilities are .39, .03, and .20, respectively. This is, of course, in accordance with what one would expect on the basis of prior reasoning.

Using the data which underlie figures 1-3, one can readily perform analysis of classification errors for different cutoff points. The focus will be on a prediction of bankruptcy within one year. A Type-I error will be said to occur if $P(X_i, \hat{\beta})$ is greater than the cutoff point and the firm is nonbankrupt; in a similar fashion, one defines a Type-II error for bankrupt firms if the probability is less than the cutoff point. It would have been preferable to perform the error analysis on a "fresh" data set and thereby (in)validate the models estimated.¹⁶ Due to the lack of data beyond 1976, this was not possible at the time of the study. This should not be a serious problem, however, for the following reasons. First, I have

¹⁶ It would, of course, have been possible to cut the sample in half and then go through the usual kind of procedures. However, the primary purpose of this paper is not one of getting a precise evaluation of a predictive model. Hence, it was decided that the full sample would be used in order to produce the smallest possible errors of the estimated coefficients.

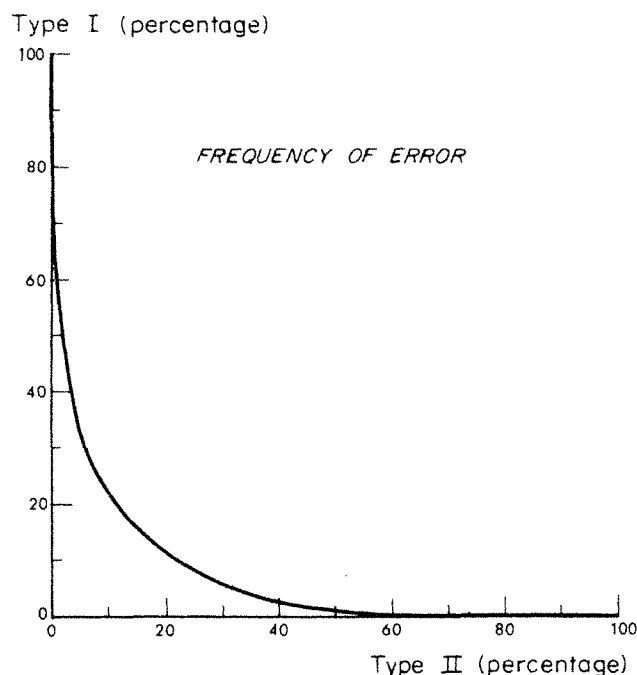


FIG. 4.

not indulged in any “data dredging” and no attempt was made to find a “best” model or even a model which is “superior” to Model 1. Second, a logit analysis is not an econometric method which is designed to find an “optimal” frontier, trading off one type of error against another. This is in contrast to *MDA* models which satisfy optimality conditions under appropriate assumptions. Third, as it turns out, the sum of the percentage of errors is relatively robust across a wide range of cutoff points. Finally, the sample size is relatively large, so the estimates should not be too sensitive to the particular sample used.¹⁷

Figure 4 depicts the frontier trading of one error against another, when the errors are expressed as percentages. Figure 5 shows the mapping from cutoff points to the two different types of errors. The cutoff point which minimizes the sum of errors is .038. At that point, 17.4 percent of the nonbankrupt firms and 12.4 percent of the 105 bankrupt firms are misclassified. Given an (infinite) population, in which half of the firms are failed and the other half nonfailed, the expected error rate would then be 14.9 percent, provided that the cutoff point is .038, and provided that the distribution of the predictors is representative of the population. I might also note that if one selects a cutoff point equal to .0095, then no Type-II error occurs and Type-I errors equal .47.

It is not easy to compare the results above with those reported by others. First, the lead time from last fiscal year-end to the date of

¹⁷ The points just made will be invalid in a real-world application of the model if the β -parameters are significantly different in future periods. This is a fairly obvious observation which has been made by others (see, e.g., Moyer [1977]).

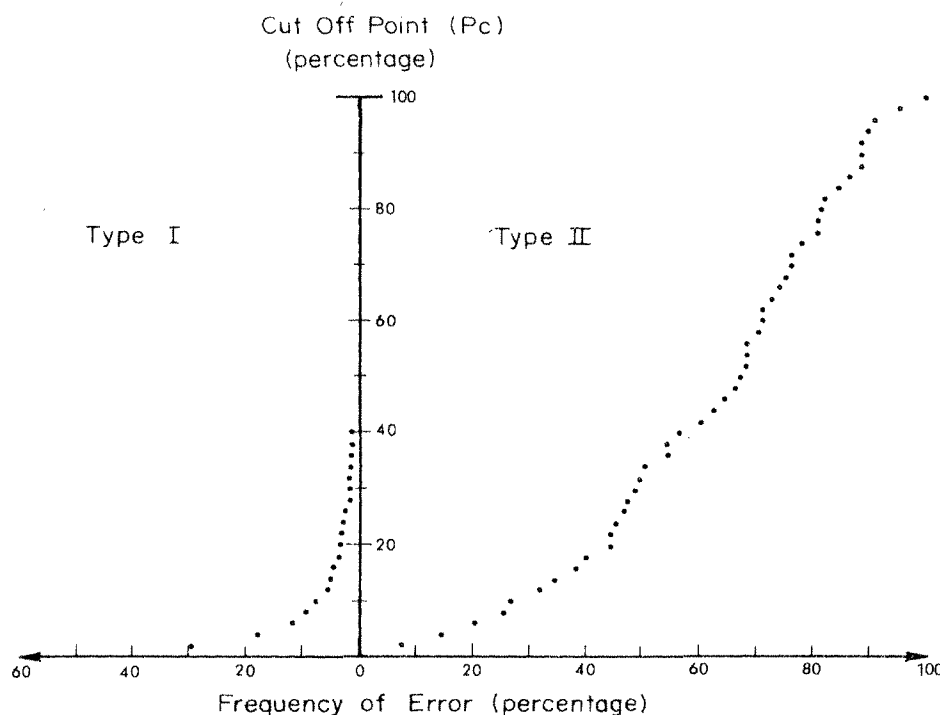


FIG. 5.

bankruptcy is much longer in the present study. Second, most studies, except for the ones by Altman and McGough [1974], Moyer [1977], and Altman et al. [1977], have not considered data from the seventies. Third, studies have differed in their selection of predictors. However, it is hard to believe that the latter is of great significance once a fair number of “basic” ratios and predictors are incorporated. One potentially important exception to the latter is the use of nonaccounting-based data such as market-price data. Such data have not been used here. Fourth, it is possible that the predictive results could be sensitive to choice of estimation procedures (e.g., the logit model versus *MDA*).

A review of previous studies indicates that most of these reported error rates which are less than those given here, with several studies reporting rates in the vicinity of 5 percent. Some of the potential sources that may account for this differential are considered below.

The first point mentioned (the lead time) can be investigated to some extent. If it is true that this is an important consideration, then the average lead time should be larger for misclassified bankrupt firms, compared to correctly classified bankrupt firms. The difference is approximately 1.75 months, so the factor may be of some importance. The difference is significant at the 20-percent level (approximately). Indeed, three of the misclassified firms would have been “correctly” classified if I had used data from the subsequent annual report (i.e., these firms belong to the group of eighteen firms discussed in a previous section). Under these circumstances the minimum of the average error is somewhat less than 13 percent, the cutoff point is somewhat larger, and both

types of errors are reduced. Hence, the lead time accounts for some of the differences. But it is hard to believe that this is the entire explanation.

As previously indicated, evidence exists regarding the second issue. Altman and McGough [1974] applied the model which Altman [1968] developed in 1968 to twenty-eight firms that failed during the period 1970–73. The predictors were computed from data one year prior to bankruptcy; the definition of “one year prior to bankruptcy” appears to be completely equivalent to that of the present study. In the 1968 study Altman reported a misclassification rate of approximately 5 percent for failed firms. The same model applied to the second group of firms yielded a misclassification rate of 18 percent (5/28). This is a substantial and significant increase, since the probability of getting five or more misclassifications out of twenty-eight observations is approximately one in one thousand if the true parameter is 5 percent. The study lacks a systematic analysis of the other type of error, so the evidence is not conclusive. More important, Altman et al. [1977] reworked much of what Altman did in 1968 using data from 1969–75 (94 percent of the total sample was from this period). The model development included a number of refinements in the utilization of discriminant analysis, as well as in the computation of financial ratios. The authors report: “... bankruptcy classification accuracy ranges from over 96 (93% holdout) one period prior to bankruptcy” (Altman et al. [1977, p. 50]). Needless to say, such results are not in accordance with those of the present study or, for that matter, the two other studies which used data from the seventies. I am unable to account for this difference. Unfortunately, Altman et al. [1977] do not report on the average lead time, so it is impossible to evaluate the importance of this factor. Also, they did not apply (or report) the predictive performance of their recent *ZETA* model on the 1974 sample. However, the authors do seem to suggest some sample dependence (see Altman et al. [1977, n. 16]). There are also differences in the definition of bankruptcy.

In sum, differences in results are most difficult to reconcile. Moyer [1977] recently reexamined the Altman model using data from the 1965–75 period. (The Altman [1968] sample was from the 1946–65 period.) The error rate reported by Moyer for the Altman model was no less than 25 percent! Reestimation of the parameters of the Altman model (using 1965–75 data and using the estimated model to classify firms) yielded an error rate of 10 percent. The latter result must be qualified (downward bias) due to the small sample size (twenty-seven bankrupt and twenty-seven nonbankrupt firms). The data were derived from *Moody's Manual* leading to additional downward bias.

Would the use of other predictors have affected the predictive power? The question cannot really be answered unless one tries out a large number of models and thereafter, necessarily, cross-validates the “best” model. The results from the model which added two predictors to Model 1 are not very encouraging, so at this point I must be quite skeptical. As

previously suggested, a significant improvement in goodness-of-fit is more likely to occur by augmenting the accounting-based data with market-price data.

At this point, I want to emphasize that the reports of the misclassified bankrupt firms seem to lack any “warning signals” of impending bankruptcy. All but two of the thirteen companies reported a profit. The two losses were relatively minor (*NITA* was -0.022 and -0.044 , respectively), and these two companies had strong financial positions (*TLTA* was .23 and .37, respectively). The median *TLTA* ratio is .55, and the range is .23–.70. The median *NITA* is 3.4 percent with a range of -0.44 to 0.156. (The firm which had *TLTA* = .70 had *NITA* = .156.) Other ratios analyzed showed the same “healthy” patterns. It is not surprising that these firms were misclassified, especially if one considers the profile of the nonbankrupt firms shown in table 3.

Moreover, the accountants’ reports would have been of little, if any, use. None of the misclassified bankrupt firms had a “going-concern qualification” or disclaimer of opinion. A review of the opinions revealed that eleven of these companies had completely clean opinions, and the two that did not had relatively minor uncertainty exceptions. Curiously, some of the firms even paid dividends in the year prior to bankruptcy. Hence, if any warning signals were present, it is not clear what these actually were.¹⁸

There is always the possibility that an alternative estimating technique, other than the logit model used, could yield a more powerful discriminatory device. Unfortunately, a priori reasoning appears to be of no use in finding such an “optimal” estimating technique. All one can do is to try some alternatives. One approach I tried, *MDA*, produced results which were somewhat “worse” than those previously reported, in that the minimum average error rate was 16 percent. More generally, I would hypothesize that many “reasonable” procedures will lead to results which will not differ too much. This robustness property can be illustrated as follows. If we use the estimates from Model 2 for the purpose of predicting bankruptcy within one year, the β -estimates from Model 2 will be evaluated in terms of their predictive power with respect to firms one year prior to bankruptcy and the 2,058 *Compustat* firms. Again, different cutoff points yield a trade-off between the two types of errors. Table 7 displays the two types of errors at selected cutoff points for Models 1 and 2. Interestingly enough, if a cutoff point of .08 is selected for Model 2, then the average error is 14.4 percent, and this is slightly better than the minimum attained by Model 1. Model 2 performs better at some other

¹⁸ Ratios other than those used in the estimating equations were also examined. For all of the misclassified firms, I was unable to detect any ratio which was clearly out of line. However, it is quite possible that a time-series analysis of an extended period would indicate that some of the firms had “significant” above-average operating risks. By the use of market data, this problem will be investigated in the future.

TABLE 7
*Type I-Type II Analysis for Selected Cutoff Points**

Estimates from: Cutoff Point	Model 1		Model 2	
	Type I**	Type II	Type I	Type II
0.0	100%	0%	100%	0%
0.02	28.7	7.6	54.3	0%
0.04	16.7	14.3	37.7	0.95
0.06	11.8	20.0	26.8	4.76
0.08	9.3	25.7	20.2	8.6
0.10	7.2	26.7	17.0	12.4
0.20	3.3	44.8	7.2	31.4
0.30	1.75	48.6	3.6	43.8
0.40	1.07	57.1	2.0	50.5
0.42	0.92	61.0	1.75	51.4
0.50	0.63	67.6	1.07	57.1
0.54	0.44	68.6	0.82	61.0
0.60	0.29	71.4	0.68	62.9
0.70	0.19	76.2	0.49	70.5
0.80	0.15	81.9	0.24	74.3
0.90	0.049	88.6	0.19	82.9
1.00	0	1.00	0	1.00

* Data sets: nonbankrupt firms and one year prior to bankruptcy.

** Type I: predict bankruptcy; actual nonbankrupt.

points too; that is, for a fixed level of one type of error for both models, the complementary error is lower for Model 2. A close examination of table 7 will verify this. To be sure, for some error rates Model 1 is better than Model 2. It seems reasonable to suggest that the models are essentially equivalent as predictive tools.

7. Conclusions

There are two conclusions which should be restated. First, the predictive power of any model depends upon when the information (financial report) is assumed to be available. Some previous studies have not been careful in this regard. Second, the predictive powers of linear transforms of a vector of ratios seem to be robust across (large sample) estimation procedures. Hence, more than anything else, significant improvement probably requires additional predictors.

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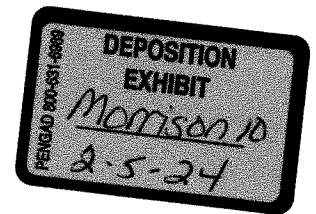
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The Loan Market Response to Dropdown and Uptier Transactions

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Abstract

Out-of-court restructuring transactions that subordinate ostensibly first-lien lenders to newly issued debt have emerged in recent years to become an important part of the world of corporate financial distress. The two principal forms of such “liability management” transactions, the so-called dropdown and uptier, rely on surprising or aggressive, if plausible, interpretations of common loan terms. The proliferation of dropdowns and uptiers has raised concerns about borrower power and about the loan market’s capacity to generate efficient contracts. We weigh these concerns by examining the extent to which the terms of newly originated loan changed after two salient transactions: J. Crew’s dropdown, in 2016, and Serta Simmons’ uptier, in 2020.

Our primary result is a contrast. Loans originated after the Serta transaction became much more likely to block uptiers. The “blocking” rate increased from about 40% to about 85%, suggesting that syndicated loan contracts can adjust rapidly to curtail borrower flexibility if market participants perceive it to reduce value. Conversely, the frequency of loans susceptible to, and the magnitude of potential subordination from, a dropdown transaction changed little after J. Crew. A provision blocking the use of intellectual property in these transactions became common years later, after a rash of dropdowns that moved valuable intellectual property out of lenders’ collateral pools. But the muted and ultimately narrow reaction to dropdowns suggests that giving borrowers the flexibility to re-pledge part of the lenders’ collateral may often be a net-valuable feature of syndicated loan deals. In a range of loans, the optimal contract may permit borrowers to subordinate lenders by one means but not the other.

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1 Introduction

So-called hardball recapitalizations have become a major theme in corporate reorganization in recent years (e.g. Ellias and Stark 2020; Mengden 2021; Dick 2021). Since 2016, several dozen distressed companies have claimed a counter-intuitive right unilaterally, or with the support of a handpicked majority of lenders, to issue new debt with priority over existing first-lien loans (Buccola 2023a). The borrowers undertaking these priming or “liability management” transactions are able to access liquidity on favorable terms without a formal bankruptcy. Dismayed lenders have cried foul, asserting in and out of court that the tactics violate the spirit, if not the letter, of their contracts. In this paper, we examine the extent to which the letter of loan contracts has changed to express that avowed spirit.

In the last decade, companies looking to create super-senior debt instruments have relied on generic transactional forms: the dropdown and the non-pro rata uptier exchange (which we refer to simply as the “uptier”). Both allow the companies undertaking them to subordinate existing creditors, but they rely on distinctive legal mechanics. In a dropdown, the borrower transfers collateral backing its loans to a subsidiary deemed by the credit agreement to be an “unrestricted” subsidiary—that is, a subsidiary not bound by the borrower’s covenants and whose assets are not subject to the lenders’ liens. The unrestricted subsidiary then re-pledges the transferred assets and uses the proceeds of *its* borrowing to support the parent company’s cash needs. In an uptier, there is no transfer of collateral, but the loan documents are amended to allow the borrower to issue new debt with a superior claim on the collateral. To procure the necessary consents, the borrower offers a bare majority of lenders the right to swap their existing loans for some of the new debt, allowing the participating lenders in effect to leapfrog members of the syndicate not invited to participate in the deal.

Reactions in the academic and practitioner presses have been overwhelmingly critical and have generally viewed dropdowns and uptiers as variations on a theme (e.g. Ellias and Stark 2020; de Fontenay 2020a, 2020b, 2021; Mengden 2021; Ayotte and Scully 2021; Dick 2021; Buccola 2023a; Schloessmann 2023). From the perspective of borrowers seeking liquidity, the two transactions are close substitutes. Moreover, both likely ran counter to market expectations when first introduced. Only by combining multiple contractual provisions in novel and contentious ways (Ayotte and Badawi 2022) are the transactions putatively permissible, and critics have viewed dropdowns and uptiers as substantively unreasonable whatever the literal terms of the relevant contracts might provide.

It is not obvious, however, that an arrangement in which borrowers have a right to incur priming debt is sub-optimal. Absent the liquidity such debt offers, the path for many distressed companies would run through Chapter 11. Bankruptcy is famously expensive, and it, too, can lead to the issuance of priming debt.² Indeed, Ayotte and Skeel (2013) argue that an important rationale for Chapter 11 is precisely that it can provide distressed businesses with incremental liquidity, including by allowing debtors to originate super-priority loans that their contracts would otherwise preclude (see also Triantis 1993). Compared to the relevant alternative, then, the primary significance of dropdowns and uptiers may lie in their dispensing with judicial oversight, which may or may not be valuable (see Casey 2011; Buccola 2019). To be sure, out-of-court and in-court priming transactions have different distributive consequences that might need to be offset with changes to pricing or capital structure, but out-of-court priming capacity might be a valuable option in the optimal contract for many borrowers.

² 11 U.S.C. § 364(d).

Nor is it obvious a priori that dropdowns and uptiers should have the same efficiency properties. Although both types of transaction allow a borrower to incur debt senior to ostensibly first-lien loans, they rely on different legal mechanics the full implications of which might produce different expected payoffs. Unrestricted subsidiaries, for instance, the existence of which make a dropdown possible, can be used not only to create priming debt but also to separate a borrower's high-growth add-on lines of business from its core enterprise.³ Leland (2007) shows theoretically the advantages of allowing a firm to design stand-alone financing arrangements for business lines with disparate risk, size, and other features that bear on the optimal capital structure. In an optimal contracting framework, any anticipated benefits of curtailing loan subordination would have to be weighed against the anticipated costs of dispensing with other uses of unrestricted subsidiaries. The non-pro rata character of uptiers, in contrast to dropdowns, might likewise produce distinctive efficiency properties. To the extent that competition among lenders to not be excluded from a favored group yields deadweight losses—from monitoring and lobbying ex ante or from litigating ex post (Buccola 2023b)—the uptier could be a relatively costly method of creating priming debt.

In this paper, we document the extent to which syndicated term loans originated after the plausibility of dropdowns and uptiers became evident to market participants, in late-2016 and mid-2020, respectively, adjusted to block the transactions or mitigate their effects. We review the legal prerequisites of each transaction and develop a set of contract features that would fully block them or mitigate their effects. We then read more than 600 leveraged loan contracts executed between January 2016, about a year before J. Crew announced the first phase of its

³ For example, Scientific Games designated its social gaming subsidiaries as unrestricted in 2016. According to the press release accompanying the event, the move was made “with the goal of maximizing growth for the company ... including potential new joint ventures, acquisitions, IPO, and other growth options.” See <https://www.prnewswire.com/news-releases/scientific-games-positions-itself-to-accelerate-growth-in-its-interactive-business-300323611.html>. The company completed a IPO of a minority stake in SciPlay Corporation in 2019.

dropdown, and June 2022, two years after Serta Simmons announced its uptier, and record whether the loan blocks or mitigates each form of priming transaction.

The analysis sheds light on two open questions. First, it speaks to whether the types of borrower flexibility that underlie priming transactions are, on balance, valuable or not. Optimal contract theory predicts that, absent bargaining impediments, loan agreements should constrain borrowers in a way that maximizes the parties' expected joint surplus. Given imperfect foresight—that is, parties' inability to foresee all prospective uses of borrower flexibility (see Ayotte and Scully 2021)—many contracts likely inadvertently permitted dropdowns and uptiers. But if the flexibility underpinning the transactions is costly on balance, then, in a responsive market, contract terms should adjust to foreclose it.

Second, our analysis bears on whether the syndicated loan market is in fact highly responsive. One might be tempted to assume that it is, since the dollar stakes are high, and the market is composed of highly compensated intermediaries and sophisticated, repeat-play investors. But empirical research indicates that contract terms in some markets defined by these same features are nevertheless sticky in the face of negative informational shocks. The sovereign debt market is the best-documented example (see e.g. Choi, Gulati & Scott 2017a, 2017b; Gulati & Scott 2013), but it appears not to be unique. Gulati and Kahan (2018), for example, document a striking failure of adjustment in corporate bond terms, which are produced in a similar institutional framework as leveraged loans. That research complements, and renders more plausible, a view widespread among loan-market participants that, whatever optimal-contract

theory might predict, in fact the non-price terms of leveraged loan contracts poorly reflect the interests of loan investors, each of whom typically buys a small piece of the total facility.⁴

Our primary result is a contrast. For the dropdown, the only way to eliminate the prospect of the transaction is to forswear unrestricted subsidiaries altogether. In our sample, roughly one-half of loans permit the borrower to create unrestricted subsidiaries, and that fraction remained constant throughout the period we study. Investors could limit the magnitude of a potential priming transaction without dispensing altogether with unrestricted subsidiaries by limiting the amount or type of collateral borrowers are allowed to transfer. We find no evidence that contracts have reduced the amount of value borrowers can invest in unrestricted subsidiaries. However, we do find that provisions blocking the dropdown of intellectual property, so-called “IP blockers,” appear increasingly frequently starting in the second half of 2020, three years after the J. Crew transaction but close on the heels of a series of IP dropdowns near the beginning of the Covid pandemic. We infer that creditors object not so much to the general possibility of dropdown transactions but to the fragility of liens on assets that are notoriously difficult to value.

Reaction to the uptier, by contrast, was swift and pronounced. Among the loans in our sample that were originated before the Serta transaction, roughly 40% blocked uptiers. Of those, most did so (presumably inadvertently) because they adhered to a pre-financial crisis norm that prohibited a necessary element of the uptier, namely borrowers repurchasing large amounts of

⁴ The best statistical evidence on the responsiveness of leveraged loan terms comes from Talley (2021), who finds that, after the Citibank mistaken-payments debacle of 2020, a new contract term explicitly permitting administrative agents to claw back erroneous payments to lenders proliferated rapidly in newly originated loans and through amendments to existing loans. Although the finding suggests that the syndicated loan market can adjust quickly to protect the interests of the administrative agent, who negotiates contract terms with the borrower, it does not directly bear on the loan market’s responsiveness to *broader lender* interests. The barriers to a Coasean bargain are presumably much lower when the negotiating context is bilateral and only one of the two parties has anything at stake. Moreover, a standard amendment rule in leveraged loan contracts allows the borrower and the administrative agent, without the consent of other lenders, to correct any ambiguous contract language, so the costs of clarifying the clawback rule would have been minimal. Since preventing dropdown and uptier transactions benefits the broader set of dispersed lenders, the scope for negotiation failures seems much larger.

their outstanding loans. In the period after Serta, the frequency of uptier blockers increased sharply, rising by the end of our sample period to about 85% of loans. By one measure, the magnitude of change in contractual practice was even larger. The principal contractual adjustment after Serta was to introduce a clause prohibiting a loan's subordination absent unanimous lender consent, which is a necessary element of an uptier. Approximately 10% of loans originated before the Serta transaction had such a clause, but by the end of our sample period, approximately 70% did.

We draw two principal conclusions. First, we reject the hypothesis that syndicated loan contracts fail to adjust when the anticipated burden of a value-destructive term falls on dispersed creditors. The speed with which terms of newly originated loans changed after the Serta Simmons transaction shows that contracts can change quickly to alter suboptimal loan terms. In the case of some terms, such as IP blockers, the market requires an accumulation of evidence before abruptly switching to a new status quo, as in the model of Kahan and Klausner (1997). Contract terms that persist following widespread recognition of their existence and implications should thus be viewed as value-enhancing or at least not importantly value-destructive. Second, we conclude that contractual features permitting the borrower flexibility to access liquidity, including by subordinating first-lien lenders, are part of the optimal loan contract for some borrowers. Despite the salience of dropdown transactions, contracts are just as likely now as before J. Crew to allow borrowers to transfer non-IP assets free and clear of liens to unrestricted subsidiaries. This fact, when viewed in light of the way contracts adjusted after the Serta transaction, suggests that for some kinds of borrowers the utility of the unrestricted subsidiary outweighs the cost to lenders of potential subordination.

2 Institutional Context and Summary of the Transactions

The managers of financially distressed companies often would like to issue debt that has priority over existing claims. When a company's earnings have been weak, it may have to rely on capital markets to fund operating expenses and investment. But distress also means that debt overhang will often rule out the sale of junior debt or equity (Myers 1977). As a consequence, issuing senior debt may be the only realistic source of liquidity.⁵

Traditionally, companies with a secured loan in place had to get lender approval to issue priming or pari passu debt. Two standard contractual features make the need for consent explicit. First, incurrence covenants prohibit borrowers and their subsidiaries from taking on new debt or permitting the creation of new liens other than specified types and amounts. A borrower seeking to issue debt in defiance of its covenants would face penalty interest rates or even enforcement proceedings. Second, in connection with a loan, borrowers and their subsidiaries often grant liens on substantially all their assets. Potential subsequent lenders would therefore know that they would rank behind the existing lenders in a bankruptcy scenario, irrespective of what they or the borrower might intend (Adler and Kahan 2013; Picker 1992). Historically financial maintenance covenants reinforced borrowers' obligation to seek lender approval (see Baird and Rasmussen 2006). Because such covenants were set to be tripped at the onset of distress (e.g. Nini, Smith & Sufi 2009, 2012; Roberts and Sufi 2009), borrowers were discouraged from subordinating lenders even if the loan contract arguably allowed it. The only options to issue priming debt were to get lender consent or to enter Chapter 11.⁶

⁵ Benmelech, Kumar, and Rajan (2022) find that leveraged firms are more likely than investment-grade firms to issue secured debt.

⁶ Even in Chapter 11, it is often difficult to subordinate incumbent lenders without broad consent. In principle, the Bankruptcy Code permits debtors to issue priming debt while in bankruptcy, 11 U.S.C. § 364(d), or

After the 2008 financial crisis, however, the foundations of lender control began to give way. Term loans, traditionally held by the banks that provided a borrower's revolving credit, were increasingly sold in small increments to non-bank institutions such as CLOs. As syndicates became more diffuse and renegotiation became more costly, restrictions on borrower activity loosened (Griffin et al. 2023; Ivashina and Vallée 2022). The virtual disappearance of financial covenants from term loan contracts was the most striking development (see e.g. Becker and Ivashina 2016; for a qualification, see Berlin et al. 2020). But borrowers have gained flexibility in a variety of less obvious ways, too, for example through more flexible definitions of operative constraints in the covenants that remain (see e.g. Badawi et al. 2021, p. 37).

The dropdown and uptier are products of the new environment. Neither transaction would have been possible, let alone commercially advisable, under the loan terms that typically prevailed before the 2008 financial crisis. Both are at least arguably permitted by terms commonly found in post-crisis loans. But although the transactions share an historical origin and allow borrowers to achieve similar ends, they work by very different legal logics. The elements of a loan contract that permit borrowers to execute one are conceptually as well as practically independent of the elements that permit the other; so, too, therefore, are the contractual terms lenders can deploy to thwart the transactions.

2.1 The Dropdown

2.1.1 Overview and Mechanics

In a dropdown, the borrower moves valuable assets out of its lenders' collateral package to a so-called "unrestricted subsidiary," which re-encumbers the assets to support its own newly

under the terms of a plan of reorganization. But bankruptcy judges apply stringent standards when determining whether to approve super-priority debtor-in-possession financing or to "cram up" a plan on non-consenting lenders.

issued debt.⁷ The logic of the transaction is straightforward: collateral for an existing loan is transferred downstream, free and clear of liens; the downstream entity borrows against the assets and uses the proceeds to relieve an upstream entity's capital needs; upstream creditors are subordinated to the extent of the value of the assets transferred. But the mechanics are subtle. In particular, a borrower's ability to do a dropdown is predicated on two features that are common, but by no means universal, in post-crisis syndicated loan contracts: the power to designate subsidiaries as "unrestricted" and the capacity to transfer valuable assets to those subsidiaries.

We illustrate a generic dropdown transaction in Figure 1. In the example, the borrower has two subsidiaries—"Sub A" and "Sub B." Sub A is a restricted subsidiary and subject to all terms of the loan agreement. The so-called "restricted group" is illustrated by the dotted box containing the borrower and Sub A. Sub B is an unrestricted subsidiary. Its existence creates two opportunities that are central to the dropdown. First, the valid transfer of an asset from the borrower to it causes any lien on the asset to be released. Collateral moved to an unrestricted subsidiary ceases to be collateral for the original loan. Second, because unrestricted subsidiaries are not bound by the covenants of the original loan, they can issue an unlimited amount of debt backed with liens on their assets. Together these features make the dropdown a formal possibility, since collateral that validly passes from a borrower to an unrestricted subsidiary can be re-pledged to support debt issued by the subsidiary. In Figure 1, the new lenders to Sub B are

⁷ The unrestricted subsidiary is a construct of credit agreements rather than a generic legal concept. It is a subsidiary in the ordinary sense—the borrower controls it and holds its equity (directly or indirectly)—but lenders agree to treat it for most purposes as if it were an arm's-length entity. Bond indentures have long used the construct, but it only entered the vocabulary of leveraged loans around the 2008 financial crisis. That change may be explained by inherent uncertainty, at the time a loan is originated, as to whether the borrower will have good cause to move assets out of the restricted group and off the consolidated balance sheet. As the number of lenders in a typical leveraged loan syndicate has grown—and the hazard of securing ex post permissions with it—it follows that the value to borrowers of establishing ex ante a right to carve out part of the lenders' collateral would have grown, too.

granted a first-priority lien on the collateral transferred from Sub A to Sub B, so they are structurally senior to the lenders to Sub A.

For the dropdown to matter as more than a formal possibility, however, a borrower must be able to transfer a substantial amount of collateral to its unrestricted subsidiaries. The power to do so is a function of what are known as the borrower's "investment baskets." In modern loan contracts, it is standard for borrowers to covenant that they will not make "investments," defined to include capital contributions to subsidiaries, unless an enumerated exception, or basket, permits it. Virtually all loans include one or more general investment baskets that give the borrower permission to invest a limited amount in whatever it wants. Some loans also include a basket specifically for investments in unrestricted subsidiaries. A borrower's unrestricted subsidiary investment capacity is the sum of the amounts available under these and perhaps other relevant baskets. Investment baskets typically allow borrowers to transfer non-cash assets, which are valued according to the borrower's good-faith estimate (with an arm's-length valuation opinion sometimes being required). The significance of a potential dropdown transaction therefore varies with the size of a borrower's investment baskets and its ability or willingness to understate the value of assets it might transfer.

2.1.2 Salient Event: The J. Crew Transaction

The dropdown came to widespread attention in a transaction executed by J. Crew in two stages beginning December 2016. At a high level, the aim and mechanics of the transaction were straightforward. The company used its unrestricted subsidiary investment capacity to create super-priority notes backed by its iconic brands, which had theretofore been part of its lenders' collateral, and then exchanged the new notes for junior, but maturing, unsecured notes (for more detail, see Ayotte and Scully 2021). The immediate consequences were to protect the equity

sponsors' investment while allowing junior creditors to become senior to the existing first-lien lenders. Beyond its impact on J. Crew's investors, though, the transaction revealed practically, and perhaps legally, the extent to which distressed borrowers could use unrestricted subsidiaries to subordinate first-lien lenders without broad-based consent.

This is not to say that the transaction lacked antecedents. In the twelve months before it, both iHeart Media and Claire's Stores had used unrestricted subsidiaries to move value away from bondholders. Claire's had even primed first-lien bonds (although with only a minimal, negative impact on them).⁸ But J. Crew was the first to use the unrestricted subsidiary to prime a loan facility, and in so doing it upset conventional norms and expectations. Indeed, the J. Crew transaction is so (in)famous in leveraged finance circles that the company's name has become a synonym for the dropdown and, more broadly, for aggressive out-of-court priming transactions. It is not unusual to hear of lenders being "J. Crewed."⁹

2.1.3 *Subsequent Developments (Bearing on Legality and Economic Significance)*

For several years after J. Crew, copycat transactions were relatively rare despite dropdowns being much discussed in leveraged finance circles. Neiman Marcus used an unrestricted subsidiary to strip collateral from its lenders in 2018.¹⁰ Revlon did likewise in 2019. Then in the second quarter of 2020, as Covid uncertainty and lockdowns threatened many businesses, five big-name distressed companies—Golden Nugget, Revlon (again), Travelport,

⁸ See Reorg, *Claire's First Lien Notes Excluded from Exchange Offer into \$210 Million of New Term Loans* (Aug. 15, 2016), <https://reorg.com/claaires-first-lien-notes-excluded-from-exchange-offer-into-230m-of-new-term-loans/> (noting that the price of first-lien loans dropped 45 basis points on announcement of the transaction).

⁹ See, e.g., Peter Coy, *In Finance, 'J. Crew' is a Verb. It Means to Stick It to a Lender*, Bloomberg Businessweek (June 17, 2019), <https://www.bloomberg.com/news/articles/2019-06-17/in-finance-j-crew-is-a-verb-it-means-to-stick-it-to-a-lender>.

¹⁰ PetSmart, also in 2018, executed a controversial lien-stripping transaction that involved an unrestricted subsidiary. But the transaction did not create priming debt, and its aims could have been accomplished without an unrestricted subsidiary at all.

Cirque du Soleil, and Party City—executed dropdowns as others threatened to do the same. Several more dropdowns followed in 2022 and 2023.

The legality of a generic dropdown has not been seriously questioned. Although lenders have expressed a combination of surprise and outrage at borrowers' use of unrestricted subsidiaries to subordinate unwilling lenders, the contractual permissions underpinning the transaction are relatively clear. Lenders have challenged the validity of several dropdowns, starting with J. Crew itself,¹¹ but principally on case-specific grounds, and disputes have always settled. No judicial decision has addressed the dropdown's essential permissibility.

2.1.4 Contractual Responses

The dropdown's mechanics and history suggest three ways loan agreements could curtail J. Crew-type dropdowns if market participants wished to do so. The first and most direct response would be to prohibit unrestricted subsidiaries outright. Distressed borrowers cannot create priming debt through a subsidiary—even a non-guarantor—if all the significant subsidiaries are subject to debt and lien covenants. Eschewing unrestricted subsidiaries would be a blunt response and would entail costs of its own if, as we have suggested, they can provide valuable financing flexibility. But doing without unrestricted subsidiaries is hardly unimaginable. After all, the construct was unknown to syndicated loan deals as recently as fifteen years ago (Bellucci and McCluskey 2017).

Two alternative responses could limit the magnitude or significance of a potential dropdown rather than do away with it altogether. The simplest way would be to reduce the size of the baskets borrowers can use to transfer assets to unrestricted subsidiaries. The tighter a

¹¹ See *Eaton Vance Mgmt. v. Wilmington Savings Fund Society*, 2018 WL 1947405 (N.Y. Sup. Ct. Apr. 25, 2018).

loan's investment baskets are, the smaller is the amount by which a dropdown can subordinate lenders. After J. Crew, leading law firms developed another approach focused on the type of assets that borrowers can transfer to unrestricted subsidiaries. The "IP blocker" is language that prevents unrestricted subsidiaries from owning intellectual property material to a borrower's business.¹² Two considerations explain the particular focus. First, intellectual property is prone to abuse. As an asset class, it is notoriously difficult to value accurately. A borrower strategically underestimating the value of its IP might move \$500 million of value out of the lenders' collateral pool under investment baskets that on their face allow only, say, \$100 million. Second, IP has in fact proved to be the asset class of choice for borrowers undertaking contentious dropdowns.¹³

2.2 *The Uptier*

2.2.1 *Overview and Mechanics*

An uptier creates super-priority debt by amending the relevant loan documents to permit it explicitly. No assets are moved, so the possibility of (unrestricted) subsidiaries is irrelevant. Instead, the borrower offers a majority of its lenders, but only them, the ability to swap into newly created, senior instruments in exchange for their consent to the creation of a new facility with a superior lien or that is senior in right of payment to the existing loan.

Notionally, then, there are two parts to the transaction, which we illustrate with a contrived example in Figure 2. One is the amendment itself. A common debt covenant limits the

¹² Jonathan Schwarzberg, "Investors tighten loan documents with J Crew blocker," Reuters (May 3, 2018), <https://www.reuters.com/article/jcrew-blocker/investors-tighten-loan-documents-with-j-crew-blocker-idUSL1N1SA1W8> (claiming that lenders "are now including language in loan documents, known as the 'J Crew blocker,' to stop companies transferring intellectual property").

¹³ Loans could prohibit the drop down of other kinds of difficult-to-value assets. Occasionally they do. For example, we found one loan (to a communications company) prohibiting the dropdown off FCC licenses and two loans that allow only cash to be dropped down. But such provisions are rare.

amount of debt borrowers can incur and requires that new debt be, among other things, junior in repayment priority. (A limited amount of *pari passu* debt is often permitted.) Liens on the enterprise's productive assets are governed by a rule of first-in-time-first-in-right, so borrowers cannot create priming debt even if they are willing to violate covenants (Adler and Kahan 2013). In combination, these features mean that a borrower can create priming debt only if it can secure an amendment relaxing the debt and lien covenants and altering the repayment waterfall or authorizing subordination of the existing lien. It has long been standard for loan contracts to condition the outright *release* of liens on unanimous lender consent, but a bare majority of lenders have usually been allowed to *subordinate* the lien and relax the covenants. In Figure 2, Lender B, which funds 60% of the existing loan, can agree to amend the credit agreement to permit a new lien that is senior (labeled “super-priority” in Figure 2) to the existing first lien.

The other part of an uptier is securing majority consent, which is challenging because traditional loan contracts make it difficult for borrowers to funnel value to favored lenders. A borrower cannot, for example, offer to pay some lenders, but not others, for their consent. Loan contracts direct the borrower to channel all payments through the administrative agent. So-called pro rata sharing provisions, which usually can be amended only with unanimous lender consent, require any lender who nonetheless recovers directly from the borrower to share the value it recovers ratably with fellow lenders (Bellucci and McCluskey 2017, p. 637). In our example in Figure 2, the borrower must find a tactic to compensate Lender B for agreeing to the amendment.

The approach that uptiering borrowers have settled on is to *buy*, at an attractive price, the favored lenders' loans using (some of) the newly created super-priority debt as consideration. Even this move is not legally straightforward, however. Until recently, most loan contracts prohibited lenders from assigning their loans to the borrower or its affiliates. To the extent that a

lender did so anyway, the pro rata sharing provision would expressly require the assigning lender to share proceeds pro rata with other lenders. Although a bare majority of lenders could have amended the contract to allow assignments to the borrower, pro rata sharing provisions usually could not be so easily amended. It was thus just not possible for borrowers to offer to repurchase from select lenders on preferential terms.

In recent years, however, some loan contracts began to establish exceptions to the general rule prohibiting assignments to the borrower (Bellucci and McCluskey 2017, pp. 640–643). These exceptions sought to replicate bond issuers’ longstanding ability to repurchase debt trading below par. Two common exceptions declare that, notwithstanding a general prohibition on borrower repurchases, the borrower or its affiliates can buy loans through (1) an auction procedure open to all lenders on a pro rata basis (typically run by the administrative agent) or (2) on a non-pro rata basis in what are called “open market” repurchases. Crucially, the contracts that allow repurchase through auction or open market transactions also carve out from the general pro rata sharing rule the proceeds of such exceptional repurchases. In Figure 2, Lender B provides \$40M of new money in exchange for a new super-priority loan with a face value of \$70M. The borrower repurchases B’s \$30M share of the original loan, leaving Lender A’s original \$20M loan contractually subordinated to the new newly created debt.

2.2.2 Salient Event: The Serta Simmons Transaction

The first completed uptier transaction was executed by Serta Simmons in June 2020. Serta had first- and second-lien term loans trading at distressed prices, and the company sought restructuring proposals from its lenders. On June 8, it announced that it had entered a transaction support agreement with a bare majority of first-and second-lien lenders that would see Serta incur more than a billion dollars of incremental, super-priority debt: \$200 million to be issued for

new money and \$875 million to swap for the consenting lenders' existing loans. Minority lenders not invited to participate in the exchange sought to enjoin the transaction, but the trial court denied the request, and the transaction closed on June 22.¹⁴

The Serta uptier had little precedent. Distressed companies have long sought creditor permission to borrow on a priming basis while threatening non-participating creditors with subordination (e.g. Bratton and Levitin 2018, p. 1639; Donaldson et al. 2021). Traditionally, though, consent inducements were offered on a pro rata basis. The closest precursor to the Serta uptier was a transaction that specialty clothier NYDJ contemplated in 2017. In form, the transaction NYDJ proposed would have been quite similar to the 2020 transactions (Dick 2021). But after minority lenders complained and a judge expressed displeasure with what he viewed as an inappropriate process, the company invited all lenders to participate in funding a new facility on a pro rata basis.¹⁵ NYDJ could have revealed a latent weakness in some credit documents, but perhaps because it was a relatively small company and the transaction did not close, the affair did not capture public attention in the way the Serta Simmons and follow-on transactions did.

2.2.3 Subsequent Developments (Bearing on Legality and Economic Significance)

The Serta transaction proved to be the first of many uptiers. Two followed quickly on its heels: Boardriders executed an uptier on August 31, 2020, and TriMark did the same two weeks later. More have been executed in 2022 and 2023.

At one point, litigation might have been expected to put an end to the uptier, because its permissibility was doubtful in a way that the permissibility of a generic dropdown was not. The

¹⁴ North Star Debt Holdings, L.P. v. Serta Simmons Bedding, LLC, 2020 WL 3411267, No. 652243/2020 (N.Y. Sup. Ct. June 19, 2020).

¹⁵ Affirmation, Exh. B, Octagon Credit Investors LLC v. NYDJ Apparel, LLC, No. 656677/2017 (N.Y. Sup. Ct. Mar. 13, 2018).

most glaring infirmity was with the notion that a borrower's repurchase of loans as part of a negotiated, multi-step transaction is a kind of "open market" purchase required by even the most contracts. Minority lenders brought damages actions in relation to each of the three uptiers executed in 2020, and in each instance the trial court denied the transaction proponents' motion to dismiss.¹⁶ But no final decision has held the transaction unlawful, and the bankruptcy judge in Serta's eventual Chapter 11 case found that the transaction complied with contract terms and was consistent with the duty of good faith and fair dealing.¹⁷

2.2.4 *Contractual Responses*

A loan contract can block an uptier by preventing either of the transaction's two parts—the subordination of a lien by a bare majority of lenders or the discriminatory inducement (i.e., the non-pro rata loan repurchase). Prohibiting subordination absent unanimous or supermajority lender consent is the technically simpler option. An additional clause in the Amendments section, in the list of lenders "sacred rights," is all that is needed. The other way to block an uptier is to prohibit or otherwise limit a borrower's ability to repurchase debt from favored lenders only. The traditional terms of syndicated loan contracts frequently accomplish this incidentally, by forbidding assignments to the borrower and requiring (absent unanimous lender consent) that the proceeds of any such assignment be shared ratably. Loans that follow the traditional approach or that route non-pro rata repurchases through an auction or other mechanism open to all lenders would make uptiers impossible.

¹⁶ ICG Global Fund I DAC v. Boardriders, Inc., 2022 WL 10085886, No. 655175/2020 (N.Y. Sup. Ct. Oct. 17, 2022); LCM XXII LTD. v. Serta Simmons Bedding, LLC, 2022 WL 953109, *8, No. 21 Civ. 3987 (KPF) (S.D.N.Y. Mar. 29, 2022) (opining that repurchase of participating lenders' loans "did not take place in what is conventionally understood as an 'open market'"); Audax Credit Opportunities Offshore Ltd. v. TMK Hawk Parent, Corp., 150 N.Y.S.3d 894 (Sup. Ct. 2021).

¹⁷ *In re Serta Simmons Bedding, LLC*, Dkt. 1071, No. 23-90020 (Bankr. S.D. Tex. June 14, 2023).

3 Hypotheses and Research Design

We try to answer whether and how loan contracts changed after it became evident that borrowers subordinating lenders via dropdowns and uptiers was a serious risk. We use the salience of the J. Crew and Serta Simmons transactions as events that alerted market participants to weaknesses in existing contract language and to the possibility that borrowers would use that language to issue priming debt.

We posit that contracting parties will write terms that they anticipate will maximize the joint surplus of their agreement net of contracting costs. Contracts are incomplete because it is impossible, or prohibitively costly, to anticipate every contingency and negotiate desirable state-contingent outcomes in advance (Ayotte and Scully 2021; Aghion and Bolton 1992). Although parties may fail to anticipate remote contingencies, we expect that when an economically significant contingency becomes salient, parties will reassess contract language and eliminate options expected to destroy value. Although priming transactions have undoubtedly always been a risk for lenders, the public response to the J. Crew and Serta Simmons transactions suggests that the risk of these specific types of subordination became much more prominent in late-2016 and mid-2020, respectively. We test the null hypothesis of no change in contracts against the alternative that contracts updated to prevent these transactions.

3.1 *The Null Hypothesis*

There are two reasons why loan contracts might not have changed. First, the contractual features that permit a dropdown or uptier may provide benefits sufficient to make them sensible components of some credit agreements despite the prospect of borrower opportunism. As we have suggested, unrestricted subsidiaries may provide certain borrowers with valuable flexibility to develop, account for, and finance separately new high-growth lines of business. Eliminating

the construct altogether might be too costly. Alternatively, it may be efficient to have a non-bankruptcy mechanism for subordinating loans, particularly in an era when syndicated loans are held by many dispersed investors (Bord and Santos 2012). Even if dropdowns and uptiers are not strictly speaking the surplus-maximizing methods by which a distressed borrower's access to liquidity can be metered, their similarity to the methods on offer in Chapter 11 (irrespective of the terms of the debtor's loan contract) might lead investors to conclude that the difference in expected firm value is negligible. That is, contract drafters might reasonably conclude that the difference between a borrower's issuing priming debt outside and inside bankruptcy is more a matter of distribution, which adjustments to loan *pricing* can fully offset, rather than surplus.

The second reason why loan contracts may not change, at least in the short-run, is that commercial contracts can be sticky. Legal scholars have noted several examples of debt contracts not updating despite a salient event that one might think would have spurred a change in the optimal contract (e.g. Gulati and Scott 2013; Choi et al. 2017a, 2017b; Gulati and Kahan 2018). This research suggests that frictions in the negotiation or drafting process can, in some contexts, prevent contracts from updating to reflect parties' assessments of the costs and benefits of salient terms (see also Clayton 2022).

3.2 *The Alternative Hypothesis*

The alternative hypothesis is that loan contracts updated to prevent dropdowns and uptiers, which we expect if blocking the priming transactions is a preferred contract feature *and* syndicated loan contracts adjust. It is a joint hypothesis since both legs must be true for us to observe a change in contract language. Stated differently, failing to reject the null hypothesis does not let us distinguish between whether allowing the priming transactions is perceived to be efficient or whether loan contracts simply have not adjusted to the new information.

There are reasons to believe that syndicated loan contracts can update quite quickly in response to a salient event. Borrowers and lenders are sophisticated parties, and there is a lot of money at stake. Talley (2021) studies the effect of a judicial decision that assigned to administrative agents the risk of accidental disbursement of funds, after Citibank, the administrative agent on a loan to Revlon, mistakenly wired the full principal amount of the loan to lenders who were in a dispute with the borrower. Bucking market convention, some lenders refused to return the funds, and a judge held that they were justified in holding onto the erroneously wired funds. Talley (2021) documents that loan contracts were quickly amended to clarify that mistaken disbursements must be returned to the administrative agent. Of course, the situation explored by Talley (2021) may be unique since administrative agents are active participants in drafting loan contracts and have incentive to protect their own interests. It remains an open question whether (and how quickly) the loan market updates in response to practices that implicate the broader set of lenders.

It is also reasonable to suspect that the contract provisions that permit borrowers to prime lenders are not features of the optimal contract; instead, dropdowns and uptiers represent purely opportunistic borrower behavior lenders had not foreseen. For the uptier, in particular, the non-pro rata mechanism results in intra-facility conflicts that syndicated loan contracts generally try to minimize. Such conflict could seemingly be avoided while preserving the ability of a borrower with broad-based lender support to access priming debt outside Chapter 11. For example, a straightforward alternative would allow a borrower to issue priming debt with simple majority

support from lenders but require that every lender be allowed to participate pro rata in the new priming loan.¹⁸

Putting these ideas together we get the following syllogism. If after 2016 (2020), syndicated term loans change to block dropdowns (uptiers), then the flexibility to do a dropdown (uptier) is not perceived to be part of an efficient contract *and* the loan market adjusts in response to lender interests. Conversely, if contract terms do not change, then *either* the relevant type of borrower flexibility can be part of an efficient contract *or* non-price loan terms are insensitive to lender interests.

3.3 *Empirical Design*

Our empirical analysis is a form of an event study. Using data on the contractual provisions that block the priming transactions, we ask how the frequency of dropdown and uptier blockers changed following announcement of the J. Crew and Serta Simmons transactions. We define the event dates as the end of 2016 (12/31/2016) and the middle of 2020 (6/30/2020). This is not to suggest that the end of 2016 and middle of 2020 were uniquely informative moments. Transactions take time to execute and involve multiple parties. At least some market participants must have contemplated the possibility of dropdowns and uptiers before J. Crew and Serta announced their respective deals. Likewise, subsequent events—later transactions and litigation outcomes—may have helped market participants to calibrate their views about future subordination transactions and, therefore, about the utility of blocking them.¹⁹ J. Crew and Serta did, however, alert a broad segment of market participants—lawyers as well as investors—to the

¹⁸ So-call “amend and extend” provisions work this way. Since 2008, many syndicated loan contracts allow borrowers to extend the maturity of a loan with the consent of only lenders willing to provide the extension, often in exchange for a higher interest rate. However, the amendment requires that all lenders be given the opportunity to participate in the extension. See Bellucci and McCluskey (2017, p. 64).

¹⁹ The secondary-market prices of J. Crew (Ivahina and Vallée 2022) and Serta (Badawi, Buccola and Nini 2023) loans fell sharply on announcement of the respective priming transactions.

logic of dropdowns and uptiers and to the fact that well-advised borrowers might try to execute them. We thus use December 2016 and June 2020 to partition our sample into three broad periods: (1) a baseline period with contracts originated before the priming transactions became salient, (2) a period following the J. Crew transaction when salience of the dropdown increased, and (3) a period following the Serta Simmons transaction when the salience of the uptier increased. Our null hypothesis is that the frequency of blockers remained constant across the periods, and we test this hypothesis against the alternatives that the frequency of dropdown blockers increased in period 2 and that the frequency of uptier blockers increased in period 3.

4 Data

4.1 The Practical Law Sample

We draw a sample of loan contracts from Thomson Reuters' Practical Law (PL) service. PL provides access to roughly 700 corporate credit agreements per year through their Comprehensive Deal Database, which compiles agreements taken from SEC filings. We begin with 4,318 contracts from January 1, 2016, through June 30, 2022, that have non-missing data on the amount of the loan. Using data provided by PL, we exclude 670 contracts that are marked as amendments to original agreements, leaving us with a sample of 3,648 loan contracts.

The PL sample appears comprehensive and representative of the full set of leveraged loans made to SEC-reporting borrowers over this period. To assess the representativeness of the PL contracts, we compare the PL sample with a sample of loans taken from Dealscan, which is a database of loans used by Thomson Reuters to generate league tables and other summaries of the loan market. Figure A1 in the Appendix plots the aggregate amount of loans covered in each of the samples. The figure shows that the PL sample includes roughly \$500 billion of loans per year, which varies between 40 percent and 50 percent of the Dealscan sample. We believe the

difference in sample sizes reflects the fact that Dealscan covers a larger set of financing events. As discussed in Roberts (2014), observations in Dealscan correspond to loan originations, amended and restated contracts, and loan amendments.²⁰ Although PL includes amended and restated agreements, we exclude all amendments.

Table 1 provides some summary statistics on the borrowers and loans covered by PL and Dealscan. Panel A shows that the distributions of loan size, spread, and maturity are quite similar across the two groups. On average, loan spreads are slightly smaller in the PL sample, but the difference is driven by the tails of the distribution; the median loan spread is very similar across the groups. Panel B compares the distribution of borrowers across industries based on the Fama and French (1997) classification of SIC codes. The distributions are nearly identical, suggesting that the samples are taken from the same underlying set of borrowers.

The advantage of the PL data is that we have easy access to the underlying credit agreements, since PL provides the URL of the underlying SEC filing in EDGAR. We use this link to extract the contract so that we can read and code contract provisions that are not available in existing datasets such as Dealscan. To focus on loans most susceptible to a dropdown or uptier, we make several restrictions to the PL sample, which are summarized in Table 2. Although the restrictions substantially reduce the sample, there are two useful benefits. First, the restrictions produce a more homogenous sample of loans that expose lenders to the highest risk of an aggressive recapitalization. Second, the restrictions can all be implemented using data from PL, which reduces the amount of reading required.

We begin with the full sample of new credit agreements and exclude debtor-in-possession loans, second-lien loans, and asset-based loans based on the logic that these loans have unique

²⁰ There is, unfortunately, no easy way to distinguish among the types of contracts.

collateral packages.²¹ We follow typical convention to drop loans to firms in financial services since many of these firms will be regulated and have unique capital structures. Finally, we drop a small number of loans with a maturity less than one year or granted in a currency other than U.S. dollars. Lenders with a short maturity are unlikely to face much risk of being primed, and the currency restriction helps create a more homogeneous sample. Of the remaining 2,795 contracts, we make two additional restrictions. First, we remove loans that PL labels as unsecured, since priming of first-lien loans is an essential ingredient in the transactions we study. We also drop the few secured loans granted to investment-grade borrowers to create a more homogeneous sample of loans. Second, we exclude loans with initial principal less than \$50 million, since smaller loans are more likely to be funded by small syndicates that permit restructuring without priming. As shown in the last two columns of the table, the removed loans very rarely include the terms “unrestricted subsidiary” or “open market,” which we determine based on an automated search of the full sample of contracts. Since the ability to create an unrestricted subsidiary is necessary for a firm to complete a dropdown transaction, this term is necessary for a loan to permit a dropdown. Similarly, since the right to repurchase loans through an open market purchase suggests that lenders have contemplated the possibility of non-pro rata assignment to the borrower, this term make is much more likely that a loan could permit an uptier. In our final analysis sample, the frequencies of these terms are 49% and 36%, confirming that the excluded loans are indeed quite different.

For each of the remaining 1,160 contracts, we read the contract and make two further restrictions. First, we exclude contracts that contemplate only a line of credit. Revolving facilities of syndicated loans are usually funded by a small group of banks (Berlin et al. 2020) who have a

²¹ The remaining loans we study are “cash-flow” loans having a lien on substantially all assets of the firm. The broad collateral pool creates the most scope for priming transactions.

relationship with the borrower, so revolving lenders are unlikely to participate—and to this point have not participated—in a non-pro rata deal. And because revolving lenders still typically benefit from financial maintenance covenants (Berlin et al. 2020), they (as a group) will typically have an effective veto of a transactions, such as a dropdown, that a borrower has may notionally have a right to pursue but which would injure the revolving loan. Term loans have thus proved to be uniquely susceptible to priming transactions. Second, we exclude any loan that we determine was not broadly syndicated, since single-lender and club loans provide no opportunity for priming within the lending group. These last two restrictions further reduce the sample to 664 contracts, which we refer to as our analysis sample.

4.2 *Contract Data*

For each contract in the analysis sample, we code a set of provisions necessary to determine if the contract blocks the dropdown and uptier transactions. For dropdowns, any contract that allows the creation or existence of an unrestricted subsidiary will permit the borrower to conduct a dropdown transaction, since every such contract in our sample provides at least some basket exception to the negative investment covenant. We code any contract that does not permit an unrestricted subsidiary as fully prohibiting a dropdown. However, among loans that allow unrestricted subsidiaries, there are two contract provisions that limit the magnitude of any potential dropdown. First, the contract can prevent IP from being invested into an unrestricted subsidiary, which we term an “IP blocker.”²² Second, we code the size of the general investment and unrestricted subsidiary baskets. Since basket capacity is cumulative, we add them together and standardize by the size of the loan. Smaller baskets restrict the amount of assets that can be moved away from existing lenders.

²² We include in this category two contracts that permit the transfer of cash and cash-equivalents only.

For uptiers, we code the two approaches to blocking the transaction. For each contract, we determine whether the contract requires unanimous or supermajority consent to subordinate existing loans. If so, the contract blocks an uptier by preventing the subordination step of the transaction. We also determine if the contract prohibits the lender from repurchasing debt on a non-pro rata basis, which can be accomplished in two ways. First, the contract can prohibit lenders from assigning any loan to the borrower or its affiliates and preclude amendment of the anti-assignment rule without consent of a super-majority of lenders. Second, the contract can require that the proceeds of any assignment to the borrower or its affiliates be shared among lenders pro rata and preclude amendment of the sharing rule without consent of a super-majority of lenders. We also code whether the contract explicitly permits the borrower to repurchase the loan on a non-pro rata basis, either through an open market purchase or a Dutch auction.

Table 3 summarizes the results of this exercise for the full analysis sample of contracts. Across the years 2016-2022, 51% of contracts prohibit a dropdown transaction, meaning that the unrestricted subsidiary construct is present in about half of leveraged loan contracts. Only 21% of contracts that permit unrestricted subsidiaries block the transfer of IP, but as we will show below, these blockers have become much more common in recent years. About one-half (49%) of loan contracts in our sample block an uptier exchange, with the majority of the uptier blockers operating via prevention of discriminatory assignment. We will show, however, that contracts have evolved to prevent uptier transactions via an anti-subordination provision.

5 Testing the Hypothesis

5.1 Visualizing the Time Series of Blockers in Leveraged Loans

We begin by exploring the time series of the unconditional frequency that contracts block dropdowns and uptiers. Panel A in Figure 3 plots the half-year frequency of contracts that lack

an unrestricted subsidiary construct. In our sample, the use of unrestricted subsidiaries did not decrease after the J. Crew transaction was announced. The frequency of contracts contemplating unrestricted subsidiaries remained roughly constant, at about one-half, throughout the seven-year sample period. Similarly, panel B shows no discernable trend in the average cumulative size of the baskets that borrowers can use to make investments into unrestricted subsidiaries. Panel C does, however, show a slow but steady increase over time in the frequency of contracts that contain an IP blocker. IP blockers were non-existent before the J. Crew transaction and did not appear until a couple years after the initial dropdown. Usage increased rapidly following the Serta transaction, and in the most recent periods the majority of new loans that contemplate unrestricted subsidiaries prohibit the investment of material IP. The combined evidence suggests that granting borrowers the ability to make investments in unrestricted subsidiaries remains a sensible component of credit agreements but allowing the transfer of IP assets provides too much borrower discretion that is subject to abuse. The evidence also shows a slow evolution of contract terms that accelerated following the Serta transaction.

Panel A in Figure 4 reports the time series of uptier blockers and shows that prohibitions on uptier exchanges increased sharply following the Serta transaction. In years prior, roughly 40% of contracts would block an uptier exchange. This frequency increased to about 75% by the middle of 2021, just one year after the Serta transaction was announced, and to over 85% by the middle of 2022. The increase is due to a sharp rise in the frequency of contracts that make lien and payment priority a sacred right. Panel B shows that, before Serta, the vast majority of contracts that blocked uptiers did so because they prohibited non-pro rata loan repurchases and that the frequency of prohibiting such repurchase did not increase after Serta. Among loans originated after Serta, however, there is a sharp rise in the propensity of contracts to condition

loan subordination on the unanimous consent of lenders, or at least the consent of every lender affected by the amendment. The rate of this provision is about eight times the rate prior to 2020. The sharp change suggests a concerted effort to prevent the uptier exchange. In Appendix A2 we plot the evolution the frequency of contracts permitting the borrower to repurchase loans on a non-pro rata basis. The figure shows that the frequency did not decrease following the Serta transaction. Instead, contracts continue to sometimes permit borrowers to repurchase outstanding loans but now typically restrict borrowers' ability to compensate selling lenders with new super-senior debt.

5.2 *Multivariate Analysis of Blockers in Leveraged Loans*

In this section, we confirm the patterns in Figures 3 and 4 by estimating a regression that controls for additional factors that might explain the use of contract terms that block the transactions. By incorporating a set of control variables in a regression, we can rule out the possibility that the trend shown in the figures is caused by changes in the composition of the sample over time. The regressions also allow us to formally test the null hypothesis that the propensity of contracts to block dropdowns and uptiers has remained constant over time. We estimate regressions of the following form:

$$y_{it} = \alpha + \beta_1 \mathbf{I}(1/1/2017 < t < 6/30/2020) + \beta_2 \mathbf{I}(6/30/2021 \leq t) + \beta_3 X_{it} + \varepsilon_{it} \quad (1)$$

where y_{it} is a feature of the contract to firm i initiated during half-year t and X_{it} is a set of characteristics related to the loan and borrower. The important variables are the two indicator variables— $\mathbf{I}(1/1/2017 < t < 6/30/2020)$ and $\mathbf{I}(6/30/2021 \leq t)$ —which denote that the loan was originated between the J. Crew and Serta transactions or after the Serta transaction, respectively. The excluded group consists of loans originated before the J. Crew transaction, so

the coefficients β_1 and β_2 provide an estimate of how the contract feature changes during these periods relative to the period prior to J. Crew.

We build the set of explanatory variables in X using observable characteristics of the borrower and the loan that could plausibly be correlated with the contract provisions that might block a dropdown or an uptier. We construct the variables using data provided by PL, Compustat, and the underlying loan agreements. PL provides data on several features of the loan and borrower, which we supplement with some data collected by hand from the credit agreements. Compustat provides accounting data for the borrower which we merge to PL using the borrower's CIK number. We use data on the borrower's total liabilities, book value of assets, and earnings before interest, taxes, depreciation, and amortization (EBITDA) measured as of the quarter-end immediately following the loan origination date.²³ We construct a measure of the firm's market value of assets as the sum of the borrower's total liabilities and the market value of equity, and we measure of the firm's intangible assets as the book value of total assets less the book value of property, plant, and equipment (PPE), inventory, receivables, and cash.

Table 4 reports the frequency of blockers for several subsamples of contracts. The top portion of the table splits the sample according to the size of the loan as reported by PL, with buckets corresponding to the smallest quarter, middle 50%, and largest quarter of loans. We conjecture that larger loans are less likely to contain blockers due to higher renegotiation costs associated with larger lending syndicates and more complex firm operations and capital structures. Indeed, the data reveal a clear pattern; relative to small loans, large loans are much less likely to block either a dropdown or an uptier. Across the full sample period, only about one-quarter of the largest loans prohibit a dropdown, likely because the flexibility provided by

²³ We match 635 of the loans to Compustat and lose a few additional observations due to missing data on EBITDA and the market value of equity.

unrestricted subsidiaries is particularly valuable for large firms. Similarly, the largest loans are less likely to include an uptier blocker. Small loans are much less likely to permit borrower repurchases, so many small loans incidentally blocked uptiers prior to Serta Simmons.

The second panel in Table 4 splits the sample by borrower leverage, measured as the ratio of the borrower's total liabilities to the market value of the borrower's assets. Since we are examining a sample of leveraged loans, all borrowers have fairly high leverage. Nevertheless, the evidence suggests that the least leveraged firms are slightly more likely to face both types of blockers. The next panel in Table 4 splits the sample by borrower profitability, measured as the ratio of the borrower's EBITDA to assets, which we label ROA. There is no evidence that blockers vary with the borrower's profitability. The fourth panel splits the borrowers into groups by the nature of the borrower's operations. Since intellectual property has been a popular asset to move away from existing creditors, we conjecture that firms with more intangible assets might face a blocker more often. We measure the intangibility of the borrower's assets as 1 minus the ratio of tangible assets to total assets, where tangible assets are the sum of PPE, inventory, receivables, and cash. In the sample, the ratio varies between 1% and 97%, has a standard deviation of 27%, and is much larger for technology firms. We do not observe much difference across the buckets, though firms with a smaller share of intangible assets are less likely to face an IP blocker. The next panel splits the sample based on whether the borrower is backed by a private equity sponsor, as determined by PL. Roughly 20% of the firms in our sample have a private equity sponsor. Sponsored firms are much more likely to be able to designate unrestricted subsidiaries and slightly less likely to face an uptier blocker; they are, however, more likely to face an IP blocker. The bottom panel in Table 4 splits the loans based on the type of lender that serves as administrative agent on the loan, which we determine from the underlying credit

agreement. We classify each agent as a large bank (which includes Bank of America, J.P. Morgan, Citigroup, and Wells Fargo), some other bank, or a nonbank. The bottom panel suggests that loans with nonbank agents are less likely to include uptier and dropdown blockers.

Table 5 presents estimates of the parameters in equation (1) for an indicator that the contract eschews unrestricted subsidiaries altogether, permits unrestricted subsidiaries but has an IP blocker, and has as uptier blocker. For each outcome, we estimate a specification with no control variables and a specification including controls for the variables in Table 4: the size of the loan (the natural log of the amount of the loan), the borrower's leverage, the borrower's ROA, the percentage of the borrower's assets that are intangible, an indicator that the borrower has a private equity sponsor, indicators that the lenders' agent is a small bank or a nonbank, and a set of industry fixed effects based on the Fama and French (1997) classification of the borrower's SIC code, as in panel B of Table 1.²⁴

The first two columns of Table 5 confirm that there is no evidence that leveraged loan contracts are any more likely to prohibit a dropdown than they were before J. Crew. If anything, incorporating control variables shifts the point estimates in column (2) more negative than column (1), but we have no reason to reject the null hypothesis that the frequency of dropdown blockers has remained constant across our sample. Similarly, including control variables has no impact on the inferences we draw regarding the evolution of IP blockers. Based on the estimates in columns (3) and (4), the frequency of IP blockers increased by about 6 percentage points during the post-J. Crew period and by about 50 percentage points following the Serta transaction. Columns (5) and (6) confirm that the trend documented in Figure 4 is not attributable to changes in loan composition. The propensity of otherwise similar contracts to block uptiers increased

²⁴ The number of observations in the regressions varies because some of the Compustat variables are missing for some observations.

sharply after the Serta transaction. Compared to prior periods, the estimate in column (6) shows that contracts are about 37 percentage points more likely to block an uptier transaction during the years following the Serta transaction.

In the Appendix, Figure A3 displays estimates of half-year indicator variables used in place of the broad period indicator variables in equation (1). For IP blockers, the point estimates confirm the slow evolution following J. Crew and acceleration following Serta, similar to the pattern in Figure 3. For uptier blockers, the figure shows a sharp increase following the Serta transaction rather than a slowly increasing trend. These patterns help substantiate the inference that the Serta transaction, perhaps along with other transactions in 2020, sparked the change in contract language.

Including control variables related to characteristics of the loan and borrower has very little impact on the estimated trend in any of the blockers. However, Table 5 does suggest a strong relationship between the presence of a dropdown blocker and the size of the loan, the presence of a private-equity sponsor, and the type of entity serving as administrative agent. Given that about one-half of loans block a dropdown transaction, the estimated coefficients in column (2) on size, sponsorship, and agent type are quite large. A one standard deviation increase in the loan amount is associated with a 19.6 percentage point reduction in the likelihood of a dropdown blocker. Compared with non-sponsored loans, sponsored loans are 28.7 percentage points less likely to block dropdowns, and loans with a nonbank agent are 17.6 percentage points less likely to do so. Larger loans and loans with a nonbank agent are also less likely to block an uptier transaction.

6 Discussion

Our empirical analysis is a formal test of the null hypothesis that the frequency of provisions bearing on borrowers' ability to execute dropdowns and uptiers has remained constant over time. That hypothesis rests on at least one of two premises being correct. Either (1) the contractual provisions that permit dropdowns and uptiers are valuable components of some syndicated loan contracts (in the sense that the benefits to borrowers of terms that allow for priming debt issuance exceed the costs to lenders of potential subordination) or else (2) they are not but non-price terms fail to adjust quickly to reflect lender interests.

Our findings allow us to reject the null hypothesis with respect to uptiers. Terms adjusted rapidly after the Serta transaction was announced. Within a year, the frequency of contracts that block uptiers had nearly doubled. We conclude that market participants view the threat of an uptier as value-destructive and that contract terms in the leveraged loan market can adjust rapidly to lender sentiment. Of course, the frequency of uptier blockers did not immediately increase to 100 percent. One can infer either that flexibility to do an uptier is a valuable component of some contracts or, as we suspect, that the mechanisms by which terms change are imperfect. If our supposition is correct, uptier blockers, accomplished by making lien subordination a sacred right, should eventually become the norm for nearly all leveraged loan contracts.

The way contracts changed in response to uptiers allows us also to conclude that market participants perceive borrowers' ability to repurchase loans at least sometimes to be a valuable feature of leveraged loan deals. Contracts could have adjusted to the uptier by returning to the pre-financial crisis rule that made non-pro rata repurchases impossible. That is not what happened, however. Contracts are just as likely after as before Serta to permit borrowers and

their affiliates to repurchase loans. Instead, borrowers have given up what was once a ubiquitous power to subordinate a loan's lien and payment priorities with majority lender consent.

Our conclusions with respect to the uptier shape our interpretation of the evidence on dropdown blockers. With respect to dropdowns, our findings do not allow us to reject the null hypothesis. The propensity of contracts to eschew unrestricted subsidiaries did not change after J. Crew. Nor did the magnitude of borrower capacity to invest in them. Because contract terms adjusted rapidly in response to the uptier, we are reluctant to attribute the persistence of unrestricted subsidiaries and associated basket capacity to a putatively non-responsive loan market (premise 2 above). Contracts could adjust to prevent dropdowns but did not. We thus interpret the evidence to suggest that, in some contexts, the unrestricted subsidiary—and therefore a borrower's ability to subordinate lenders—is a feature of the optimal loan contract (premise 1 above).

The pattern of change in the use of IP blockers is more mysterious. Although an IP blocker is less restrictive than elimination of unrestricted subsidiaries or reduction in basket capacity, it nevertheless limits borrowers' ability to conduct a dropdown. But the timing of the change is puzzling. For a while following the J. Crew transaction, the use of IP blockers barely budged. We only observe a large increase starting in the second half of 2020. Why did contracts not change quickly after J. Crew, but only later? We propose that a flurry of dropdown transactions executed between April and July 2020 caused lenders to update their views on the likelihood that future borrowers would take advantage of contractual flexibility specifically by carving out of the collateral pool a type of asset the value of which is easy to understate. As stated previously, five distressed companies announced dropdowns as the initial revenue shocks from Covid fallout hit corporate treasuries. All of them used IP. Other companies are rumored to

have threatened to do likewise. We cannot rule out the possibility that it took several years for the loan market to respond to the J. Crew transaction, but such a lag would be in tension with the market's responsiveness to the uptier. A better explanation is that the events of 2020 revealed new information to lenders about expected costs of borrower flexibility to drop down IP specifically.

Going forward we expect more priming transactions, as borrowers use unrestricted subsidiary capacity to finance new debt. Lenders seem content to allow borrowers the flexibility needed to do so even if it may decrease loans' expected recoveries in some cases. Splitting lender classes via uptier transactions will be very uncommon, however, as the vast majority of new contracts will prohibit borrowers from subordinating existing loans without unanimous or affected-lender consent. More broadly, our evidence suggests that the loan market can update quickly when borrowers exploit contract terms in ways that lenders had not foreseen. Conversely, when one observes the persistence of provisions that seemingly allow borrowers to undermine lender expectations, one should therefore look to the countervailing benefits of borrower flexibility rather than market failure or borrower "power."

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Figure 1. The Dropdown

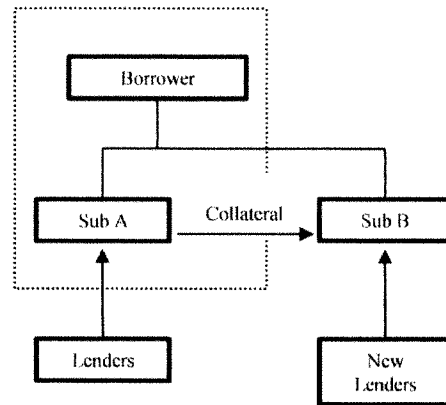


Figure 2. The Uptier

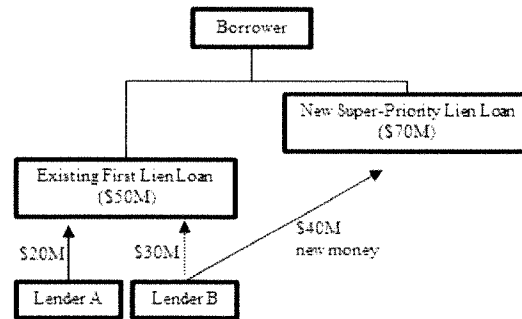


Figure 3. The Evolution of Dropdown Blockers

Panel A plots the half-year frequency of contracts that prevent a dropdown transaction. Among contracts that permit a dropdown, panel B plots the average sum of the general investment basket and the unrestricted subsidiary basket (if any) scaled by the size of the loan, and panel C plots the frequency of an IP blocker. The vertical capped lines are 95% confidence intervals. The J. Crew event happened during 2016h2, and the Serta event happened during 2020h1.

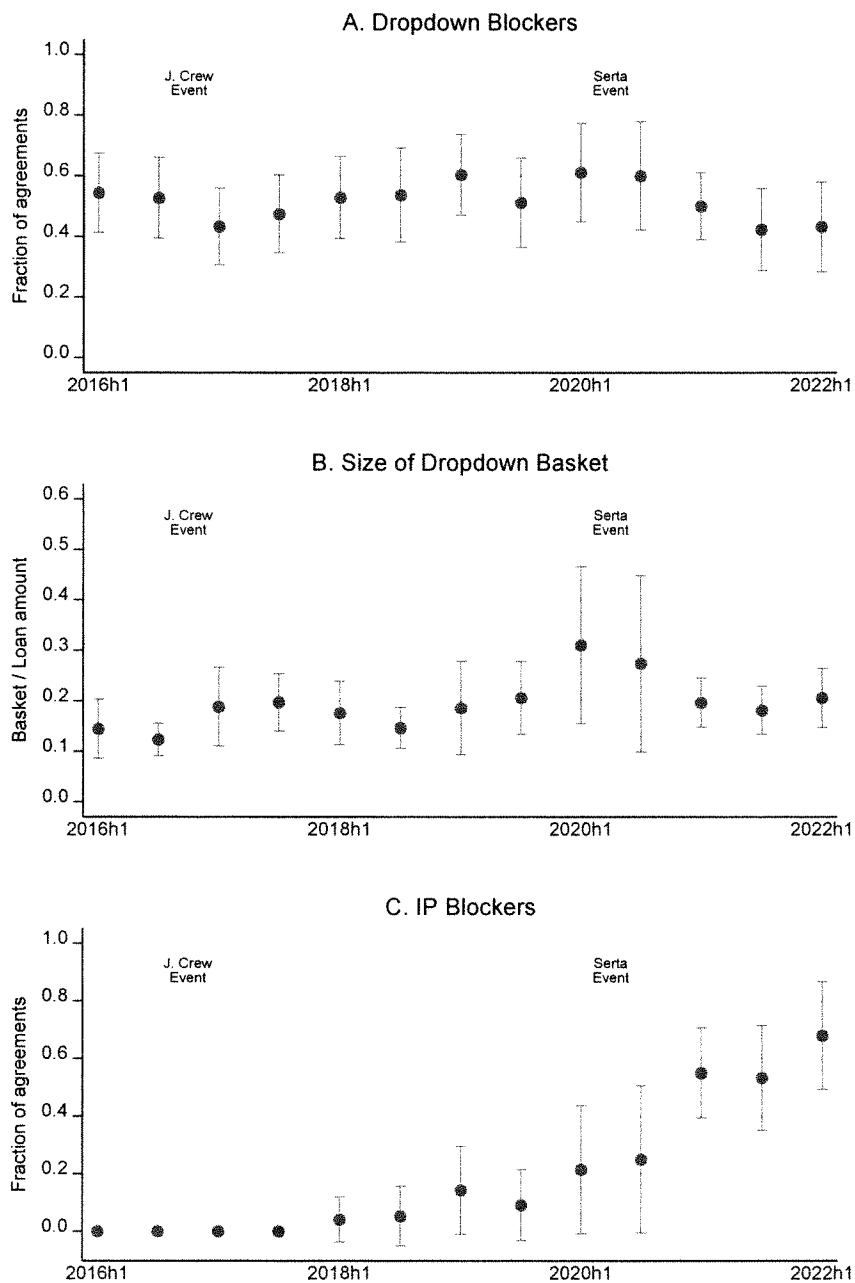


Figure 4. The Evolution of Uptier Blockers

Panel A plots the half-year frequency of contracts that block an uptier transaction. Panels B and C plot the half-year frequency of contracts that prohibit an uptier via subordination blocker and prohibit an uptier via assignment blocker. The vertical capped lines are 95% confidence intervals. The J. Crew event happened during 2016h2, and the Serta event happened during 2020h1.

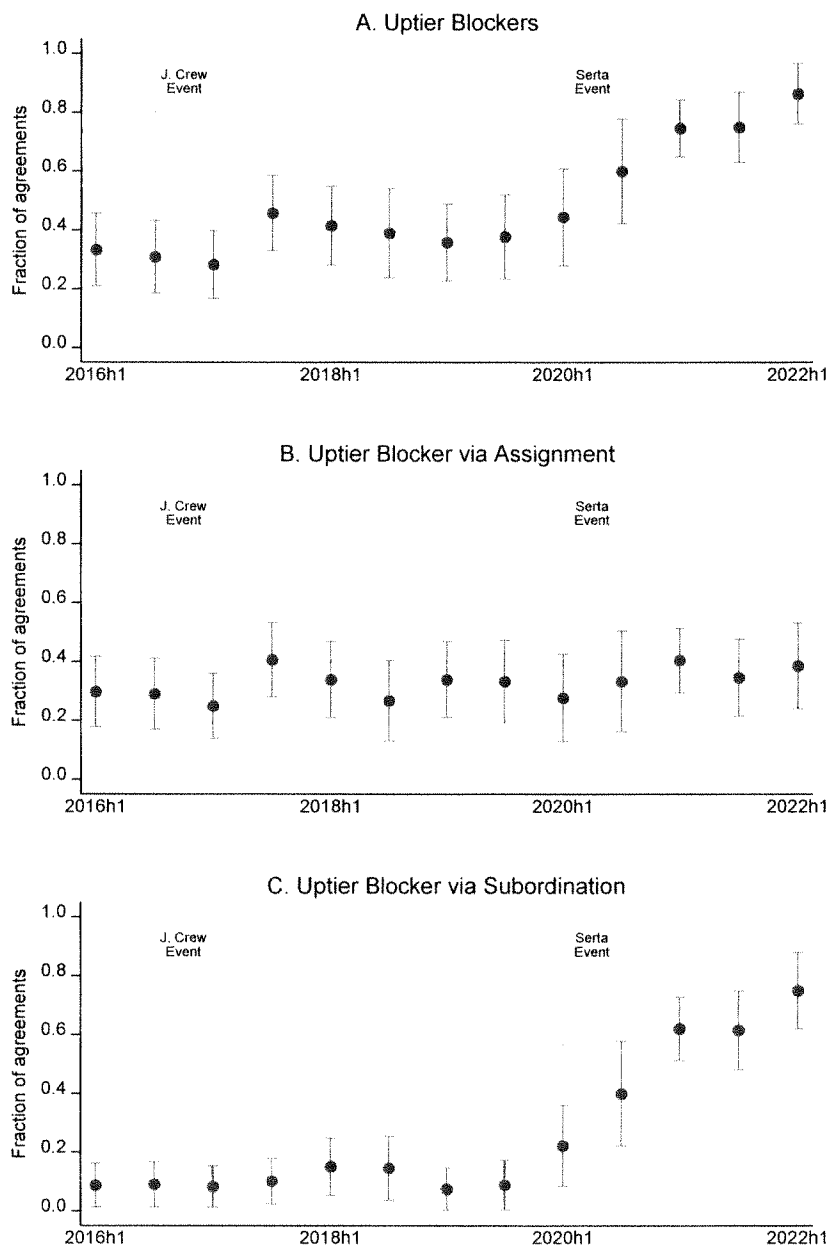


Table 1. Understanding the Practical Law Sample

The table reports summary statistics for a sample of loans from Dealscan and the sample of contracts in Practical Law. The Dealscan sample includes loans to U.S. borrowers that can be matched to financial statement data in Compustat within 180 days of the origination date of the loan. Data on loan size is from Dealscan for the Dealscan sample and from Practical Law for the Practical Law Sample. Data on loan spread and loan maturity are from Dealscan and reported for the sample of Practical Law deals that can be merged to Dealscan. Panel B reports the distribution of firms by industry, based on the Fama-French classification of SIC code.

A. Borrower and Loan Characteristics

	Mean	25th Percentile	50th Percentile	75th Percentile	N
Loan size (\$ millions)					
Dealscan	960	200	480	1,000	8,454
Practical Law	924	145	440	1,000	3,648
Loan spread (bps)					
Dealscan	199	125	150	225	7,612
Practical Law	186	113	143	200	1,778
Loan maturity (years)					
Dealscan	4.2	3.0	5.0	5.0	8,386
Practical Law	4.1	3.0	5.0	5.0	1,902

B. Borrower Industry

Industry	Dealscan	Practical Law
Consumer NonDurables	5%	6%
Consumer Durables	3%	3%
Manufacturing	12%	10%
Oil, Gas, and Coal	5%	6%
Chemicals and Allied Products	3%	3%
Business Equipment	13%	14%
Telephone and Television Transmission	4%	3%
Utilities	8%	7%
Wholesale, Retail, and Some Services	11%	11%
Healthcare, Medical Equipment, and Drugs	6%	10%
Finance	17%	15%
Other	13%	12%

Table 2. Understanding the Analysis Sample

The table summarizes the process for generating the contracts that comprise the analysis sample. The sample begins with the unique credit agreements originated between January 1, 2016, and June 30, 2022, taken from Practical Law. We initially exclude the following loans, as determined by Practical Law: debtor-in-possession (DIP) loans, second-lien loans, asset-based loans, borrowers from any financial services industry, loans with maturity less than one year, and loans not denominated in U.S. dollars. We then exclude unsecured loans, loans to borrowers with an investment-grade rating, and loans less than \$50 million, as determined by Practical Law. Of the remaining contracts, we exclude the following based on our reading of the agreements: deals without a term loan and loans not broadly syndicated. The columns “Search of excluded group” report the frequency that an automated search program finds the phrases “Unrestricted Subsidiary” and “Open Market” in the contracts of the excluded group. Among the contracts in the analysis sample, the frequencies of the phrases “Unrestricted Subsidiary” and “Open Market” are 49% and 36%, respectively.

	Remaining Contracts	Search of excluded group	
		"Unrestricted Subsidiary"	"Open Market"
Contracts that are not amendments	2,795		
Removing unsecured and investment-grade	1,412	7%	3%
Removing loans < \$50M	1,160	13%	9%
Contracts that we read	1,160		
Removing revolver only	765	30%	8%
Removing single lender	664	25%	7%

Table 3. Understanding Dropdown and Uptier Blockers

The table summarizes the provisions in credit agreements that block dropdown and uptier transactions. The analysis sample is described in Table 2.

	Mean	25th Percentile	75th Percentile	N
<i>Dropdown Related Provisions</i>				
Blocks a dropdown transaction	51%			664
IP blocker	21%			325
Investment basket / loan amount	19%	8%	14%	322
<i>Uptier Related Provisions</i>				
Blocks an uptier transaction	49%			664
Via subordination blocker	27%			664
Via assignment blocker	33%			664
Permits discriminatory repurchases	41%			664
Permits repurchase, prohibits uptier	34%			273

Table 4. Dropdown and Uptier Provisions and Loan/Borrower Characteristics

The table reports the frequency of credit agreements that block a dropdown transaction or an uptier transaction, split by characteristics of the loan or borrower. Loan size is the principal amount of the loan. ROA is the ratio of the borrower's EBITDA to assets. Intangible assets % is 1 minus the ratio of tangible assets to the market value of total assets, where tangible assets are the sum of PPE, inventory, receivables, and cash. Large banks include Bank of America, J.P. Morgan, Citigroup, and Wells Fargo.

	N	Dropdown Blockers		Uptier Blocker
		Dropdown Blocker	IP Blocker	
<i>Overall</i>	664	51%	21%	49%
<i>Loan size</i>				
Bottom 25%	167	78%	27%	60%
Middle 50%	337	50%	25%	49%
Top 25%	160	26%	13%	36%
<i>Borrower liabilities / assets</i>				
Bottom 25%	159	62%	36%	60%
Middle 50%	318	47%	21%	47%
Top 25%	158	47%	12%	47%
<i>Borrower ROA</i>				
Bottom 25%	155	49%	29%	45%
Middle 50%	308	49%	17%	50%
Top 25%	154	53%	22%	51%
<i>Intangible assets %</i>				
Bottom 25%	159	53%	15%	50%
Middle 50%	318	49%	24%	51%
Top 25%	158	53%	22%	49%
<i>Borrower sponsored</i>				
No	526	57%	18%	50%
Yes	138	30%	29%	43%
<i>Admin agent</i>				
Large bank	341	50%	21%	53%
Other bank	162	41%	21%	38%
Nonbank	148	63%	18%	52%

Table 5. Blockers across Periods

The table reports coefficient estimates from OLS regressions of contract provisions on indicators that the loan was originated during the period 1/1/2017-6/30/2020 (“Post J. Crew, Pre Serta”) and during the period 7/1/2020-6/30/2022 (“Post Serta”); the excluded category is loans originated between 1/1/2016 and 12/31/2016 (“Pre J. Crew”). In columns (1) and (2), the dependent variable is an indicator that the contract fully blocks a dropdown transaction; in columns (3) and (4), the dependent variable is an indicator that the contract prevents the borrower from investing intellectual property (IP) in the unrestricted subsidiary, and the sample is restricted to loans that permit a dropdown transaction; in columns (5) and (6), the dependent variable is an indicator that the contract blocks an uptier transaction. The regressions in columns (2), (4), and (6) include additional control variables, which are standardized, and a set of industry fixed effects based on the Fama and French (1997) classification of the borrower’s SIC code. Robust standard errors are reported in parentheses. ** and * denote statistical significance at the 1% or 5% level, respectively.

	Blocks a dropdown transaction		IP Blocker		Blocks an uptier transaction	
	(1)	(2)	(3)	(4)	(5)	(6)
Post J. Crew, Pre Serta	-0.014	-0.049	0.060**	0.063*	0.065	0.011
	(0.054)	(0.053)	(0.019)	(0.031)	(0.051)	(0.055)
Post Serta	-0.058	-0.079	0.542**	0.497**	0.430**	0.373**
	(0.059)	(0.058)	(0.048)	(0.057)	(0.054)	(0.059)
Ln(loan amount)		-0.196**		-0.054		-0.099**
		(0.019)		(0.028)		(0.021)
Borrower debt / assets		-0.022		-0.01		-0.052
		(0.026)		(0.033)		(0.028)
Borrower ROA		-0.003		-0.003		0.029
		(0.018)		(0.026)		(0.019)
Intangible assets %		-0.018		0.025		-0.055
		(0.027)		(0.029)		(0.030)
Borrower sponsored		-0.287**		-0.011		-0.07
		(0.045)		(0.053)		(0.054)
Agent: small bank		0.079		0.019		-0.024
		(0.047)		(0.055)		(0.049)
Agent: nonbank		-0.176**		0.032		-0.138**
		(0.047)		(0.048)		(0.050)
Industry fixed effects	No	Yes	No	Yes	No	Yes
R-squared	0.002	0.260	0.331	0.363	0.126	0.209
N	664	576	325	288	664	576

Appendix for
“The Loan Market Response to Dropdown and Uptier Transactions”
Vincent S.J. Buccola and Greg Nini

Figure A1. Coverage in Practical Law

The figure plots the annual amount of loans issued in a sample of loans from Dealscan and in the sample of contracts in Practical Law. The Dealscan sample includes loans to U.S. borrowers that we can match to financial statement data in Compustat, using the linking file provided and updated by Chava and Roberts (2008), within 180 days of the origination date of the loan.

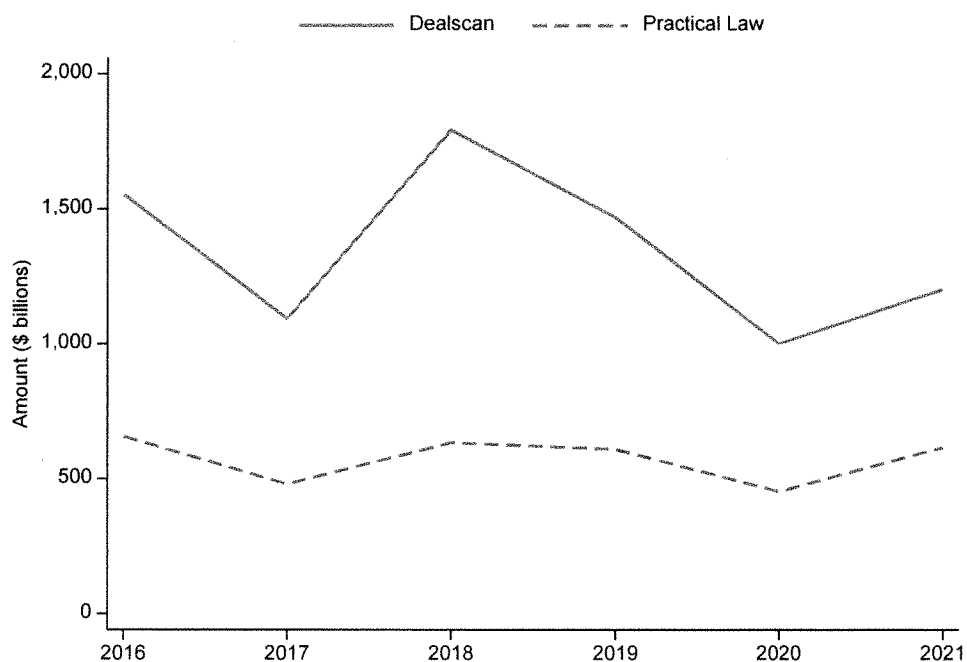


Figure A2. The Evolution of Discriminatory Repurchases

The figure plots the half-year frequency of contracts that the borrower to repurchase the loan on a non-pro rata basis, either through an open market purchase or a Dutch auction. The vertical capped lines are 95% confidence intervals. The J. Crew event happened during 2016h2, and the Serta event happened during 2020h1.

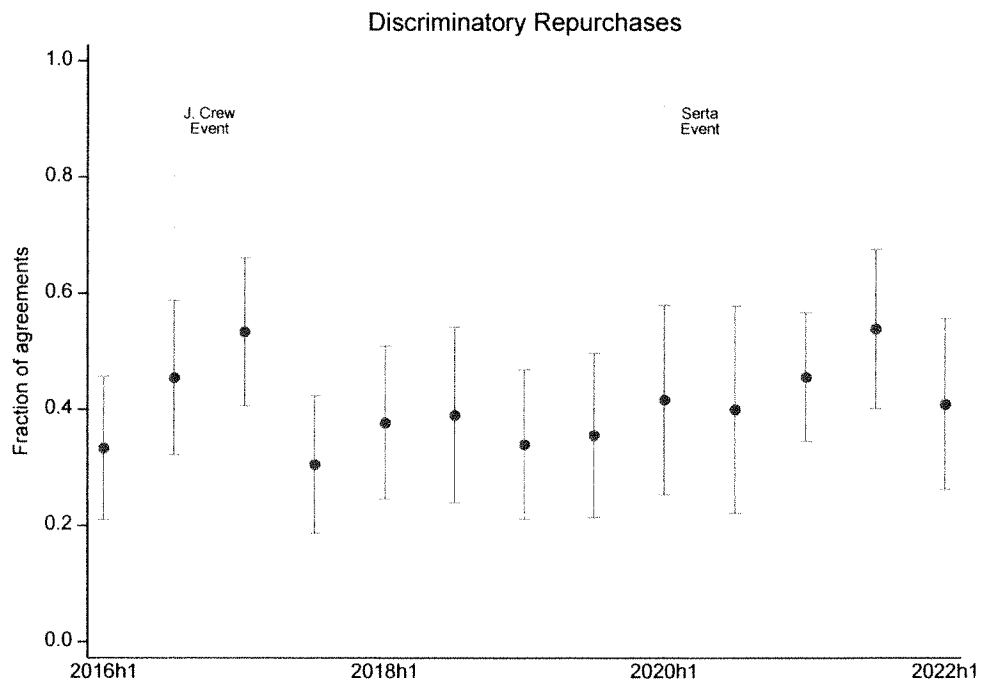
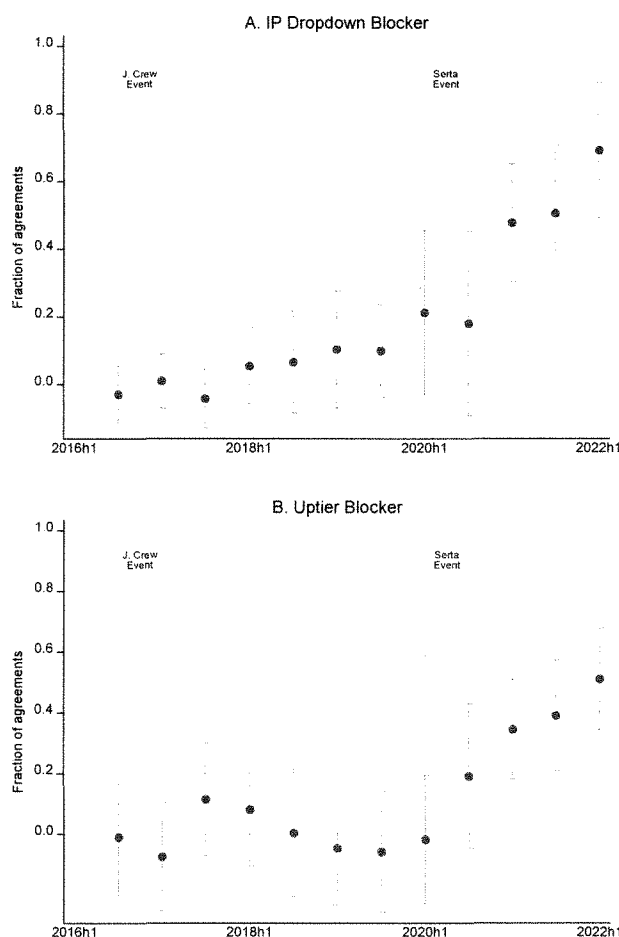


Figure A3. Period-by-Period Evolution of Blockers

The graphs plot the estimated coefficients and 95% confidence intervals for the half-year indicator variables from an expanded version of regression (1) in the main text. The omitted period is the first half of 2016, so the estimated coefficients represent the change in the frequency of the blocker during the half-year relative to the first half of 2016, conditional on the characteristics of the borrower and loan. Each regression includes the additional control variables from Table 5: the size of the loan (the natural log of the amount of the loan), the borrower's leverage, the borrower's ROA, the percentage of the borrower's assets that are intangible, an indicator that the borrower has a private equity sponsor, indicators that the lenders' agent is a small bank or a nonbank, and a set of industry fixed effects based on the Fama and French (1997) classification of the borrower's SIC code. In Panel A, the dependent variable is an indicator that the loan has an IP dropdown blocker and the sample is restricted to loans that permit a dropdown transaction, and in Panel B, the dependent variable is an indicator that the loan has any uptier blocker. The J. Crew event happened during 2016h2, and the Serta event happened during 2020h1.



COOPER-STANDARD AUTOMOTIVE INC.

as Issuer ,

the Guarantor s named herein

and

U.S. BANK NATIONAL ASSOCIATION

as Trustee and Collateral Agent

INDENTURE

Dated as of May 29, 2020

13.000% Senior Secured Notes due 2024

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INDENTURE, dated as of May 29, 2020 among Cooper-Standard Automotive Inc., an Ohio corporation (the "Issuer"), the Guarantor s (as defined below) and U.S. Bank National Association, as trustee (in such capacity, the "Trustee") and collateral agent (in such capacity, the "Collateral Agent").

Each party agrees as follows for the benefit of the other parties and for the equal and ratable benefit of the Holder s.

ARTICLE I

DEFINITIONS AND INCORPORATION BY REFERENCE

Section 1.01 Definitions.

"ABL Collateral" means the following assets of the Issuer and the Guarantor s: (a) all accounts receivable (except to the extent constituting proceeds of equipment, real property, or intellectual property); (b) all inventory; (c) all instruments, chattel paper and other contracts, in each case, evidencing, or substituted for, any accounts receivable; (d) all guarantees, letters of credit, security and other credit enhancements, in each case, for the accounts receivable; (e) all documents of title for any inventory; (f) all commercial tort claims and general intangibles (other than intellectual property and Capital Stock) to the extent relating to any of the accounts receivable or inventory; (g) all bank accounts or Securities Account s into which any proceeds of accounts receivable or inventory are deposited (including all cash and other funds on deposit therein, except to the extent constituting identifiable proceeds of the Fixed Asset Collateral) but excluding Excluded Deposit Account s (as defined in the Security Agreement); (h) all tax refunds (except to the extent derived from an identifiable sale of equipment, real property or intellectual property and not from any other ABL Collateral); (i) all books and records relating to any of the foregoing; and (j) all substitutions, replacements, accessions, products or proceeds (including, without limitation, insurance proceeds) of any of the foregoing, in each case, other than Excluded Assets ; provided, however, that to the extent that identifiable Proceeds of Fixed Asset Collateral are deposited or held in any Deposit Account s or Securities Account s that constitute ABL Collateral after an Enforcement Notice , then such Collateral or other identifiable Proceeds shall be deemed to be Fixed Asset Collateral .

"ABL Collateral Agent" means Bank of America, N.A. and its successors and assigns in that capacity and any agent under any agreement that constitutes the ABL Credit Facility .

"ABL Credit Facility" means that certain third amended and restated loan agreement, dated as of November 2, 2016, by and among Holdings , the Issuer , the other borrowers party thereto, the guarantors party thereto, Bank of America, N.A., as agent, and the lenders, agents and other parties party thereto, and including any related notes, guarantees, collateral documents, instruments and agreements executed in connection therewith, and, in each case, as amended by amendment no. 1 to third amended and restated loan agreement and limited waiver, dated as of March 24, 2020 and amendment no. 2 to third amended and restated loan agreement, dated as of May 18, 2020, and as further amended, restated, supplemented, waived, renewed or otherwise modified from time to time, and (if designated by the Issuer) as replaced (whether or not upon termination, and whether with the

original lenders or otherwise), restructured, repaid, refunded, refinanced or otherwise modified from time to time, including (if designated by the Issuer) any agreement or indenture or commercial paper facilities with banks or other institutional lenders or investors extending the maturity thereof, refinancing, replacing or otherwise restructuring all or any portion of the Indebtedness under such agreement or agreements or indenture or indentures or any successor or replacement agreement or agreements or indenture or indentures or increasing the amount loaned or issued thereunder permitted under Section 4.09 or altering the maturity thereof or adding Restricted Subsidiaries as additional borrowers or guarantors thereunder and whether by the same or any other agent, lender or group of lenders.

"ABL Debt " means:

- (1) Indebtedness (including letters of credit and reimbursement obligations with respect thereto) and other obligations incurred by the ABL Loan Parties under or in respect of the ABL Credit Facility and/or secured by the ABL Security Documents ; and
- (2) guarantees by any Restricted Subsidiary in respect of any of the obligations described in the foregoing clause (1).

"ABL Default " means an "Event of Default " as defined in the ABL Credit Facility .

"ABL Documents " means, collectively, the ABL Credit Facility , the Relative Priority Intercreditor Agreement and the credit agreement or other agreement governing other ABL Debt and the security documents related to the foregoing.

"ABL Foreign Collateral " means the ABL Collateral of the Issuer or any Guarantor that is a Foreign Subsidiary .

"ABL Loan Parties " means, collectively, Holdings , the Issuer and the other borrowers and guarantors from time to time party to the ABL Credit Facility .

"ABL Obligations " means ABL Debt and all other Obligations in respect thereof, including Cash Management Obligations and Hedging Obligations .

"ABL Security Documents" means all security agreements, pledge agreements, control agreements, collateral assignments, mortgages, deeds of trust, security deeds, deeds to secure debt, hypothecs, collateral agency agreements, debentures or other instruments, pledges, grants or transfers for security or agreements related thereto executed and delivered by the Issuer or any Guarantor creating or perfecting (or purporting to create or perfect) a Lien upon collateral (including, without limitation, financing statements under the UCC) in favor of the ABL Collateral Agent , for the benefit of any of the Holder s of ABL Debt , in each case, as amended, modified, restated, supplemented or replaced, in whole or in part, from time to time, in accordance with its terms and the applicable ABL Documents subject to the terms of the Relative Priority Intercreditor Agreement , as applicable.

"Accounting Change" has the meaning set forth in the definition of "GAAP ."

"Additional Amounts" has the meaning set forth in Section 2.19.

"Additional Assets" means:

- (1) any property or assets (other than Indebtedness and Capital Stock) to be used by the Issuer or a Restricted Subsidiary ;
- (2) the Capital Stock of a Person that becomes a Restricted Subsidiary as a result of the acquisition of such Capital Stock by the Issuer or another Restricted Subsidiary ; or
- (3) Capital Stock constituting a non-controlling interest in any Person that at such time is a Restricted Subsidiary .

"Additional Notes" has the meaning set forth in Section 2.01.

"Advance Offer" has the meaning set forth in Section 4.08.

"Advance Portion" has the meaning set forth in Section 4.08.

"Advisory Firm" means an accounting, appraisal, investment banking firm or consultant of nationally recognized standing that is, in the good faith judgment of the Issuer , qualified to perform the task for which it has been engaged.

"Affiliate" of any specified Person means any other Person directly or indirectly controlling or controlled by or under direct or indirect common control with such specified Person . For purposes of this definition, "control," as used with respect to any Person , means the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of such Person , whether through the ownership of voting securities, by agreement or otherwise. For purposes of this definition, the terms "controlling," "controlled by" and "under common control with" have correlative meanings.

"Affiliate Transaction" has the meaning set forth in Section 4.12.

"Agent" means any Registrar , Paying Agent , Depository Custodian , or agent for service or notices and demands.

"Agent Members" has the meaning set forth in Section 2.16.

"amend" means to amend, supplement, restate, amend and restate or otherwise modify; and "amendment" shall have a correlative meaning.

"Applicable Treasury Rate" for any Make-Whole Redemption Date means the yield to maturity at the time of computation of United States Treasury securities with a constant maturity (as compiled and published in the most recent Federal Reserve Statistical Release H.15(519) that has become publicly available at least two Business Days prior to such Make-Whole Redemption Date (or, if such Statistical Release is no longer published, any publicly available source of similar market data)) most nearly equal to the period from the Make-Whole Redemption Date to June 1, 2022; *provided, however*, that if the period from the Make-Whole Redemption Date to June 1, 2022 is not equal to the constant maturity of a United States Treasury security for which a weekly average yield is given, the Applicable Treasury Rate shall be obtained by linear interpolation (calculated to the nearest one-twelfth of a year) from the weekly average yields of United States Treasury securities for which such yields are given except that if the period from the Make-Whole Redemption Date to June 1, 2022 is less than one year, the weekly average yield on actually traded United States Treasury securities adjusted to a constant maturity of one year shall be used.

"asset" means any asset or property, whether real, personal or mixed, tangible or intangible.

"Asset Disposition" means any sale, conveyance, transfer or other disposition (or series of related sales, conveyances, transfers or dispositions) by the Issuer or any Restricted Subsidiary , including any disposition by means of a merger, consolidation or similar transaction (each referred to for the purposes of this definition as a "disposition"), of:

- (1) any shares of Capital Stock of a Restricted Subsidiary (other than directors' qualifying shares or shares required by applicable law to be held by a Person other than the Issuer or a Restricted Subsidiary);
 - (2) all or substantially all the assets of any division or line of business of the Issuer or any Restricted Subsidiary ; or
 - (3) any other assets or property of the Issuer or any Restricted Subsidiary outside of the ordinary course of business of the Issuer or such Restricted Subsidiary .
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Notwithstanding the foregoing, none of the following shall be deemed to be an Asset Disposition :

- (1) a disposition by a Restricted Subsidiary to the Issuer or by the Issuer or a Restricted Subsidiary to a Restricted Subsidiary ;
 - (2) a disposition of all or substantially all the assets of the Issuer in compliance with Section 5.01 or a disposition that constitutes a Change of Control pursuant to this Indenture ;
 - (3) a sale, contribution, conveyance or other transfer of accounts receivable, or participation therein, and Receivables Assets (or a fractional undivided interest therein) in a Permitted Receivables Financing ;
 - (4) the license or sublicense of intellectual property or other intangibles;
 - (5) the lease, assignment or sublease of any real or personal property in the ordinary course of business;
 - (6) any surrender or waiver of contract rights or settlement, release, recovery on or surrender of contract, tort or other claims in the ordinary course of business;
 - (7) the granting of Lien s not prohibited by Section 4.13;
 - (8) the disposition by the Issuer or any of its Restricted Subsidiaries of (i) cash and Cash Equivalents , (ii) inventory and other assets acquired and held for resale in the ordinary course of business, (iii) damaged, uneconomical, negligible, worn out or obsolete assets or other assets (including equipment and intellectual property) that, in the Issuer 's reasonable judgment, are no longer used or useful in the business of the Issuer or its Restricted Subsidiaries , or (iv) rights granted to others pursuant to leases or licenses, to the extent not materially interfering with the operations of the Issuer or its Restricted Subsidiaries ;
 - (9) *[Intentionally Omitted]*;
 - (10) any exchange of assets for assets (including a combination of assets (which assets may include Equity Interests or any securities convertible into, or exercisable or exchangeable for, Equity Interests , but which assets may not include any Indebtedness) and Cash Equivalents) of comparable or greater market value or usefulness to the business of the Issuer and its Restricted Subsidiaries , taken as a whole, as determined in good faith by the Issuer ;
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- (11) dispositions of receivables in connection with the compromise, settlement or collection thereof in the ordinary course of business or in bankruptcy or similar proceedings and exclusive of factoring or similar arrangements;
 - (12) the issuance by the Issuer or a Restricted Subsidiary of preferred stock or any convertible securities;
 - (13) *[Intentionally Omitted]*;
 - (14) any sale of assets received by the Issuer or any Restricted Subsidiary upon foreclosure on a Lien ;
 - (15) the unwinding of any Hedging Obligations (including sales under forward contracts);
 - (16) any dispositions to the extent required by, or made pursuant to customary buy/sell arrangements between the joint venture parties set forth in joint venture arrangements and similar binding agreements;
 - (17) the lease or sublease of office space;
 - (18) the abandonment, farm-out, lease, assignment, sublease, license or sublicense of any real or personal property in the ordinary course of business;
 - (19) the sale, lease, assignment, license, sublease or discount of inventory, equipment, accounts receivable, notes receivable or other current assets held for sale in the ordinary course of business or the conversion of accounts receivable to notes receivable or other dispositions of accounts receivable in connection with the collection or compromise thereof;
 - (20) dispositions of property pursuant to casualty events, foreclosures or any similar action on assets;
 - (21) any financing transaction with respect to property constructed or acquired by the Issuer or a Restricted Subsidiary after the Issue Date ;
 - (22) the lapse or abandonment of intellectual property rights in the ordinary course of business, which in the reasonable judgment of the Issuer are not material to the conduct of the business of the Issuer and its Restricted Subsidiaries taken as a whole; or
 - (23) a single transaction or series of related transactions that involve the disposition of assets, or issuance or sale of Capital Stock of any Restricted Subsidiary , with a Fair Market Value of less than \$20.0 million.
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"Authentication Order" has the meaning set forth in Section 2.01.

"Bankruptcy Code" means Title 11 of the United States Code entitled "Bankruptcy," as in effect on the Issue Date and as may be amended from time to time, or any successor statute.

"Bankruptcy Law" means the Bankruptcy Code or any similar federal, state, local or foreign law for the relief of debtors.

"Board of Directors" means, with respect to any Person, the board of directors or comparable governing body of such Person.

"Borrowing Base" means, as of any date, an amount equal to the lesser of (A) the maximum facility amount (subject to certain adjustments) and (B) (i) up to 85% of eligible accounts receivable; plus (ii) the lesser of 70% of eligible inventory or 85% of the appraised net orderly liquidation value of eligible inventory; plus (iii) up to the lesser of \$30.0 million and 85% of eligible tooling accounts receivable; minus reserves established by the ABL Collateral Agent.

"Business Day" has the meaning set forth in Section 12.07.

"Capital Stock" means:

- (1) in the case of a corporation, corporate stock;
- (2) in the case of an association or business entity, any and all shares, interests, participations, rights or other equivalents (however designated) of corporate stock;
- (3) in the case of a partnership or limited liability company, partnership or membership interests (whether general or limited); and
- (4) any other interest or participation that confers on a Person the right to receive a share of the profits and losses of, or distribution of assets of, the issuing Person.

"Capitalized Lease Obligations" of any Person means, at the time any determination thereof is to be made, the amount of the liability in respect of a capital lease that would at such time be required to be capitalized and reflected as a liability on a balance sheet (excluding the footnotes thereto) in accordance with GAAP; provided that any obligation in respect of operating leases of the Issuer or its Restricted Subsidiaries, whether entered into before or after the Issue Date, that are (in accordance with GAAP as in effect on December 31, 2019) or characterized as capital lease obligations of the Issuer and its Restricted Subsidiaries on a consolidated basis under GAAP will be deemed not to be treated as a Capitalized Lease Obligation or Indebtedness.

"Cash Consideration" has the meaning set forth in Section 4.08.

"Cash Equivalents" means:

- (1) U.S. Dollars, Canadian dollars, Chinese yuan, Japanese yen, pounds sterling, euros or the national currency of any participating member state of the European Union or other currencies held by the Issuer or its Restricted Subsidiaries from time to time in the ordinary course of business;
 - (2) securities issued or directly and fully guaranteed or insured by the government of the United States, Canada or any country that is a member of the European Union or any agency or instrumentality thereof, in each case, with maturities not exceeding two years from the date of acquisition;
 - (3) certificates of deposit, time deposits and eurodollar time deposits with maturities of one year or less from the date of acquisition, bankers' acceptances, in each case, with maturities not exceeding one year, and overnight bank deposits, in each case, with any commercial bank having capital and surplus in excess of \$500,000,000, or the foreign currency equivalent thereof, and whose long-term debt is rated "A" or higher or the equivalent thereof by Moody's or S&P (or reasonably equivalent ratings of another internationally recognized Ratings Agency);
 - (4) repurchase obligations for underlying securities of the types described in clauses (2) and (3) above entered into with any financial institution meeting the qualifications specified in clause (3) above;
 - (5) commercial paper issued by a corporation (other than an Affiliate of the Issuer) rated at least "A-1" or the equivalent thereof by Moody's or S&P (or reasonably equivalent ratings of another internationally recognized Ratings Agency) and, in each case, maturing within one year after the date of acquisition;
 - (6) readily marketable direct obligations issued by any state of the United States of America or any municipal or political subdivision thereof with a rating of "AA-" from S&P or "Aa3" from Moody's or guaranteed by a financial institution with a rating of "AA-" from S&P or "Aa3" from Moody's (or reasonably equivalent ratings of another internationally recognized Ratings Agency), in each case, with maturities not exceeding two years from the date of acquisition;
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(7) Indebtedness issued by Person s with a rating of "A" or higher from S&P or "A-2" or higher from Moody's , in each case, with maturities not exceeding two years from the date of acquisition; and

(8) investment funds investing at least 90% of their assets in securities of the types described in clauses (1) through (6) above.

Notwithstanding the foregoing, Cash Equivalents shall include amounts denominated in currencies other than those set forth in clause (1) above; *provided* that such amounts are converted into any currency listed in clause (1) as promptly as practicable and in any event within ten Business Day s following the receipt of such amounts.

For the avoidance of doubt, any items identified as Cash Equivalents under this definition will be deemed to be Cash Equivalents under this Indenture regardless of the treatment of such items under GAAP .

"Cash Management Obligations." means (1) obligations of the Issuer or any of its Restricted Subsidiaries in respect of any overdraft and related liabilities arising from treasury, depository, cash pooling arrangements and cash management or treasury services or any automated clearing house transfers of funds, (2) other obligations in respect of netting services, employee credit or purchase card programs and similar arrangements and (3) obligations in respect of any other services related, ancillary or complementary to the foregoing (including any overdraft and related liabilities arising from treasury, depository, cash pooling arrangements and cash management services, corporate credit and purchasing cards and related programs or any automated clearing house transfers of funds).

"Certain Other Indebtedness." has the meaning set forth in Section 4.15.

"CFC." means a "controlled foreign corporation" within the meaning of Section 957 of the Code .

"Change of Control." means the occurrence of any of the following:

(1) any Transfer (other than by way of merger or consolidation) of all or substantially all of the assets of Parent and its Subsidiaries taken as a whole to any "person" (as defined in Section 13(d) of the Exchange Act) or "group" (as defined in Sections 13(d)(3) and 14(d)(2) of the Exchange Act), other than any Transfer to Holdings , the Issuer or one or more Subsidiaries ;

(2) a "person" (as defined above) or "group" (as defined above), becomes, directly or indirectly, the "beneficial owner" (as defined in Rules 13d-3 and 13d-5 under the Exchange Act) of more than 50% of the voting power of the Voting Stock of Parent , other than as a result of (i) any transaction where the voting power of the Voting Stock of Parent

immediately prior to such transaction constitutes or is converted into or exchanged for a majority of the voting power of the Voting Stock of such beneficial owner or (ii) any merger or consolidation of Parent with or into any "person" (as defined above) (a "Permitted Person") or a Subsidiary of a Permitted Person, in each case, if immediately after such transaction no person (as defined above) is the beneficial owner (as defined above), directly or indirectly, of more than 50% of the voting power of the Voting Stock of such Permitted Person; or

(3) the Issuer ceases to be a Subsidiary of Parent.

Notwithstanding the preceding or any provision of Section 13d-3 of the Exchange Act, (i) a Person or group shall not be deemed to beneficially own Voting Stock subject to a stock or asset purchase agreement, merger agreement, option agreement, warrant agreement or similar agreement until the consummation of the acquisition of the Voting Stock in connection with the transactions contemplated by such agreement and (ii) a Person or group will not be deemed to beneficially own the Voting Stock of another Person as a result of its ownership of Voting Stock or other securities of such other Person's Parent Entity (or related contractual rights) unless it owns 50% or more of the total voting power of the Voting Stock of such Parent Entity.

"Change of Control Offer" has the meaning set forth in Section 4.07.

"Change of Control Payment" has the meaning set forth in Section 4.07.

"Change of Control Payment Date" has the meaning set forth in Section 4.07.

"Commission" means the United States Securities and Exchange Commission.

"Code" means the U.S. Internal Revenue Code of 1986, as amended from time to time.

"Collateral" means all of the assets and properties subject (or purported to be subject) to the Liens, created by the Notes Security Documents.

"Consolidated EBITDA" means, with respect to any Person for any period, the Consolidated Net Income of such Person for such period plus, without duplication, to the extent the same was deducted in calculating Consolidated Net Income:

- (1) Consolidated Taxes; *plus*
 - (2) Consolidated Interest Expense; *plus*
 - (3) Consolidated Non-cash Charges; *plus*
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(4) any fees, expenses, charges or losses (other than Consolidated Non-cash Charges) related to any issuance of Equity Interests, investment, acquisition, disposition, recapitalization or the incurrence or repayment of Indebtedness (whether or not successful), and any amendment or modification to the terms of any such transaction, including (i) such fees, expenses or charges related to the issuance of the Notes, (ii) any amendment or other modification of other Indebtedness and (iii) commissions, discounts, yield and other fees and charges (including any interest expense) related to any Permitted Receivables Financing; *plus*

(5) the amount of loss or discount on sale of receivables and Receivables Assets in connection with a Permitted Receivables Financing; *plus*

(6) the amount of any restructuring charges or reserves (which, for the avoidance of doubt, shall include retention, severance, systems development and establishment costs, conversion costs, excess pension charges, curtailments and modifications to pension and post-retirement employee benefit plan costs or charges and contract termination costs, including future lease commitments, costs related to the start-up, closure, relocation or consolidation of facilities and costs to relocate employees and any one-time costs incurred in connection with acquisitions after the Issue Date); *plus*

(7) (x) the amount of "run rate" net cost savings, synergies and operating expense reductions projected by the Issuer in good faith to result from actions taken, committed to be taken or with respect to which substantial steps have been taken or are expected in good faith to be taken no later than twelve (12) months after the date of determination to take such action (calculated on a *pro forma* basis as though such cost savings, operating expense reductions and synergies had been realized on the first day of the period for which Consolidated EBITDA is being determined and if such cost savings, operating expense reductions and synergies were realized during the entirety of such period), net of the amount of actual benefits realized during such period from such actions and (y) the amount of "run rate" net cost savings, synergies and operating expense reductions projected by the Issuer in good faith to result from actions taken, committed to be taken or with respect to which substantial steps have been taken or are expected in good faith to be taken no later than twelve (12) months after the end of such period (calculated on a *pro forma* basis as though such cost savings, operating expense reductions and synergies had been realized on the first day of the period for which Consolidated EBITDA is being determined and if such cost savings, operating expense reductions and synergies were realized during the entirety of such period), net of the amount of actual benefits realized during such period from such actions; *provided*, that such cost savings, operating expense reductions and synergies are reasonably identifiable and factually supportable (it is understood and agreed that "run-rate" means the full recurring benefit for a period that is associated with any action taken, committed to be taken or with respect to which substantial steps have been taken or are expected to be taken); *provided, further*, that the aggregate amount of cost savings, operating expense reductions and synergies added pursuant to this clause (7) shall not exceed 20.0% of Consolidated EBITDA for such period (giving *pro forma* effect to the relevant transaction, other than any cost savings, synergies, operating

expense reductions) determined prior to giving effect to any adjustments pursuant to this clause (7); *plus*

(8) costs of surety bonds incurred in such period in connection with financing activities; *plus*

(9) any costs or expense incurred pursuant to any management equity plan or stock option plan or other management or employee benefit plan or agreement or any stock subscription or shareholder agreement, to the extent that such costs or expenses are funded with cash proceeds contributed to the capital of the Issuer or any Restricted Subsidiary or the net cash proceeds of an issuance of Equity Interests of the Issuer (other than Excluded Equity) solely to the extent that such net cash proceeds are excluded from the calculation of the amount available for Restricted Payments pursuant to the Restricted Payments Basket; *plus/minus*

(10) gains or losses due solely to fluctuations in currency values and the related tax effects;

less, without duplication, non-cash items increasing Consolidated Net Income for such period (excluding any items that represent the reversal of any accrual of, or cash reserve for, anticipated cash charges in any prior period).

"Consolidated Fixed Charge Coverage Ratio" means the ratio of (A) Consolidated EBITDA of the Issuer and its Restricted Subsidiaries during the most recent four consecutive full fiscal quarters for which financial statements are available (the "Four-Quarter Period") ending on or prior to the date of the transaction giving rise to the need to calculate the Consolidated Fixed Charge Coverage Ratio (the "Transaction Date") to (B) Consolidated Fixed Charges of the Issuer and its Restricted Subsidiaries for the Four-Quarter Period.

For purposes of this definition, Consolidated EBITDA and Consolidated Fixed Charges shall be calculated after giving effect on a pro forma basis for the period of such calculation to the incurrence of any Indebtedness or the issuance of any Preferred Stock of the Issuer or any Restricted Subsidiary (and the application of the proceeds thereof) and any repayment, retirement or extinguishment of Indebtedness or redemption of other Preferred Stock (and the application of the proceeds therefrom) (other than the incurrence or repayment of Indebtedness in the ordinary course of business for working capital purposes pursuant to any revolving credit arrangement unless such Indebtedness has been permanently repaid and has not been replaced) occurring during the Four-Quarter Period or at any time subsequent to the last day of the Four-Quarter Period and on or prior to the Transaction Date, as if such incurrence, repayment, retirement, extinguishment, issuance or redemption, as the case may be (and the application of the proceeds thereof), occurred on the first day of the Four-Quarter Period.

For purposes of making the computation referred to above, investments, acquisitions, dispositions, mergers, amalgamations, consolidations and disposed operations (as determined in accordance with GAAP) and operational changes that have been made by the Issuer or any of its Restricted Subsidiaries during the Four-Quarter Period or subsequent to such Four-Quarter Period and on or prior to or simultaneously with the Transaction Date shall be calculated on a *pro forma* basis assuming that all such investments, acquisitions, dispositions, mergers, amalgamations, consolidations, disposed operations and operational changes (and the change in any associated fixed charge obligations and the change in Consolidated EBITDA resulting therefrom) had occurred on the first day of the Four-Quarter Period. If since the beginning of such period any Person that subsequently became a Restricted Subsidiary or was merged or amalgamated with or into the Issuer or any of its Restricted Subsidiaries since the beginning of such period shall have made any investment, acquisition, disposition, merger, amalgamation, consolidation, disposed operation or operational change that would have required adjustment pursuant to this definition, then the Consolidated Fixed Charge Coverage Ratio shall be calculated giving pro forma effect thereto for such Four-Quarter Period as if such investment, acquisition, disposition, merger, amalgamation, consolidation, disposed operation or operational change had occurred at the beginning of the Four-Quarter Period ; *provided* that, notwithstanding any classification under GAAP of any Person or business in respect of which a definitive agreement for the disposition thereof has been entered into as discontinued operations, such transaction shall not be treated as a disposition or a discontinued operation for purposes of the calculation of the Consolidated Fixed Charge Coverage Ratio until such transaction shall have been consummated.

For purposes of this definition, whenever pro forma effect is to be given to a transaction, the pro forma calculations shall be made in good faith by a responsible officer of the Issuer (and may include, for the avoidance of doubt and without duplication, cost savings, operating expense reductions and synergies resulting from any asset sale or other disposition or such investment, acquisition, disposition, merger, amalgamation or consolidation or discontinued operation which is being given pro forma effect that have been or are expected to be realized, in each case any such adjustments may be incremental to (but not duplicative of) pro forma adjustments made pursuant to clause (7) of the definition of "Consolidated EBITDA " and calculated in accordance with and subject to the limitations set forth in clause (7) of the definition of "Consolidated EBITDA "). In addition to such adjustments pro forma calculations may also include Pro Forma Cost Savings .

If any Indebtedness bears a floating rate of interest and is being given pro forma effect, the interest on such Indebtedness shall be calculated as if the rate in effect on the Transaction Date had been the applicable rate for the entire period (taking into account any Hedging Obligations applicable to such Indebtedness with a remaining term of 12 months or longer, and in the case of any Hedging Obligation applicable to such Indebtedness with a remaining term of less than 12 months, taking into account such Hedging Obligation to the extent of its remaining term). Interest on a Capitalized Lease Obligation shall be deemed to accrue at an interest rate reasonably determined by a responsible officer of the Issuer to be the rate of interest implicit in such Capitalized Lease Obligation in accordance with GAAP. For purposes of making the computation referred to above, interest on any Indebtedness under a revolving credit facility computed on a pro forma basis shall be computed based upon the average daily balance of such Indebtedness during the applicable period or, if lower, the maximum commitments under such revolving Credit Facility as of the Transaction Date. Interest on Indebtedness that may optionally be determined at an interest rate based upon a factor of a prime or similar rate, a eurocurrency interbank offered rate, or other rate, shall be deemed to have been based upon the rate actually chosen, or, if none, then based upon such optional rate chosen as the Issuer may designate.

"Consolidated Fixed Charges" for any period means the sum, without duplication, of (a) Consolidated Interest Expense of the Issuer and the Restricted Subsidiaries for such period, plus (b) all dividend payments on any series of Disqualified Stock of the Issuer or any Restricted Subsidiary or any Preferred Stock of any Restricted Subsidiary (other than any such Disqualified Stock or any Preferred Stock held by the Issuer or a Restricted Subsidiary or to the extent paid in Qualified Equity Interests) for such period.

"Consolidated Interest Expense" means, with respect to any Person for any period, the sum, without duplication, of:

(1) interest expense of such Person and its Restricted Subsidiaries for such period, on a consolidated basis, to the extent such expense was deducted (and not added back) in computing Consolidated Net Income (*including* (i) amortization of original issue discount or premium resulting from the issuance of Indebtedness at less than or greater than par, as applicable, (ii) the interest component of Capitalized Lease Obligations, (iii) net payments and receipts (if any) pursuant to interest rate Hedging Obligations and (iv) all commissions, discounts and other fees and charges owed with respect to letters of credit or bankers acceptances, and *excluding* (q) amortization of deferred financing fees, debt issuance costs, commissions, fees and expenses and original issue discount with respect to Indebtedness issued in connection with the issuance of the Notes or any intercompany Indebtedness, (r) any expensing of bridge, commitment or other financing fees, (s) any expense resulting from the discounting of Indebtedness in connection with the application of recapitalization or purchase accounting, (t) penalties and interest relating to taxes, (u) non-cash interest expense attributable to movement in mark-to-market valuation of Hedging Obligations or other derivatives (in each case, permitted hereunder and under GAAP), (v) accretion or accrual of discounted liabilities not constituting Indebtedness, (w) interest expense attributable to a

parent entity resulting from push-down accounting, and (x) commissions, discounts, yield, make whole premium and other fees and charges (including any interest expense) related to any Permitted Receivables Financing);

(2) interest on Indebtedness , the proceeds of which have been contributed to such Person (other than as Excluded Equity) and that has been guaranteed by, and is otherwise considered Indebtedness of, such Person or any of its Subsidiaries (to the extent not already included in clause (1) above); and

(3) consolidated capitalized interest of such Person and its Restricted Subsidiaries for such period, whether paid or accrued;

less interest income for such period; *provided that*, for purposes of calculating Consolidated Interest Expense , no effect shall be given to the discount and/or premium resulting from the bifurcation of derivatives under FASB ASC 815 and related interpretations as a result of the terms of the Indebtedness to which such Consolidated Interest Expense relates.

For purposes of this definition, interest on a Capitalized Lease Obligation shall be deemed to accrue at an interest rate reasonably determined by such Person to be the rate of interest implicit in such Capitalized Lease Obligation in accordance with GAAP .

"Consolidated Net Income." means, with respect to any Person for any period, the aggregate of the Net Income of such Person and its Restricted Subsidiaries for such period, on a consolidated basis; *provided, however*, that:

(1) any after-tax effect of extraordinary, non-recurring or unusual gains, losses or charges (less all fees and expenses relating thereto) or expenses (including relating to the issuance of the Notes), severance, relocation costs, curtailments or modifications to pension and post-retirement employee benefit plans, start-up, facilities opening, transition, integration and other restructuring costs, charges, reserves or expenses (including related to acquisitions after the Issue Date and to the start-up, closure and/or consolidation of facilities), new product introductions, one-time compensation charges and signing, retention or completion bonuses, shall be excluded;

(2) the cumulative effect of a change in accounting principles during such period, shall be excluded;

(3) any net after-tax effect of gains or losses from disposed, abandoned, transferred, closed or discontinued operations and any net after-tax gains or losses on disposal of disposed, abandoned, transferred, closed or discontinued operations, shall be excluded;

(4) any net after-tax gains or losses (less all fees and expenses or charges relating thereto) attributable to business dispositions (including Capital Stock of any Person) or Asset Disposition s or abandonments other than in the ordinary course of business (as determined in good faith by the Issuer) shall be excluded;

(5) any net after-tax gains or losses (less all fees and expenses or charges relating thereto) attributable to the early extinguishment of Indebtedness , Hedging Obligations and other derivative instruments (including deferred financing costs written off and premiums paid), shall be excluded;

(6) the Net Income for such period of any Person that is not a Subsidiary of such Person , or is an Unrestricted Subsidiary , or that is accounted for by the equity method of accounting (other than a Guarantor), shall be excluded to the extent such Person or Unrestricted Subsidiary is prohibited by contract (including its organizational documents) from making dividends or distributions to the Issuer or a Restricted Subsidiary ; *provided* that Consolidated Net Income of the Issuer shall be increased by the amount of dividends or distributions or other payments that are actually paid in cash (or to the extent converted into cash or Cash Equivalents) to the referent Person or a Restricted Subsidiary thereof in respect of such period;

(7) solely for the purpose of determining the amount available for Restricted Payment s under the Restricted Payment s Basket , the Net Income for such period of any Restricted Subsidiary (other than any Guarantor) shall be excluded to the extent that the declaration or payment of dividends or similar distributions by such Restricted Subsidiary of its Net Income is not at the date of determination permitted without any prior governmental approval (which has not been obtained) or, directly or indirectly, is otherwise restricted by the operation of the terms of its charter or any agreement, instrument, judgment, decree, order, statute, rule or governmental regulation applicable to that Restricted Subsidiary or its stockholders, unless such restriction with respect to the payment of dividends or similar distributions has been legally waived; *provided* that the Consolidated Net Income of such Person shall be increased by the amount of dividends or other distributions or other payments actually paid in cash (or converted into cash) or Cash Equivalents by any such Restricted Subsidiary to such Person , to the extent not already included therein;

(8) any non-cash compensation expense realized from employee benefit plans or post-employment benefit plans, grants of stock appreciation or similar rights, phantom equity, stock options, restricted stock, units or other rights to officers, directors and employees of such Person or any of its Restricted Subsidiaries shall be excluded;

(9) (a) (i) the non-cash portion of "straight-line" rent expense shall be excluded and (ii) the cash portion of "straight-line" rent expense that exceeds the amount expensed in respect of such rent expense shall be included and (b) non-cash gains, losses, income and expenses resulting from fair value accounting required by FASB ASC 815 shall be excluded;

(10) unrealized gains and losses relating to hedging transactions and mark-to-market of Indebtedness denominated in foreign currencies resulting from the application of FASB ASC 830 shall be excluded;

(11) any (a) severance or relocation costs or expenses, (b) one-time non-cash compensation charges, (c) the costs and expenses after the Issue Date related to employment of terminated employees, or (d) costs or expenses realized in connection with or resulting from stock appreciation or similar rights, phantom equity, stock options, restricted stock units or other rights existing on the Issue Date of officers, directors and employees, in each case, of such Person or any of its Restricted Subsidiaries , shall be excluded;

(12) accruals and reserves, contingent liabilities and any gains and losses on the settlement of any pre-existing contractual or non-contractual relationships as a result of the issuance of the Notes that are established or adjusted within 12 months after the Issue Date and that are so required to be established or adjusted in accordance with GAAP or as a result of adoption or modification of accounting policies shall be excluded;

(13) the effect of any non-cash impairment charges or write-ups, write-downs or write-offs of assets (including intangible assets, goodwill and deferred financing costs but excluding accounts receivable) or liabilities resulting from the application of GAAP (including in connection with the issuance of the Notes) and the amortization of intangibles arising from the application of GAAP (excluding any non-cash item to the extent that it represents an accrual of or reserve for cash expenditures in any future period except to the extent such item is subsequently reversed) shall be excluded; and

(14) any fees, expenses or charges (such as capitalized manufacturing profit in inventory) incurred during such period, or any amortization thereof for such period, in connection with any acquisition, investment, recapitalization, disposition, issuance or repayment of Indebtedness , issuance of Equity Interests , refinancing transaction or amendment or modification of any debt instrument (in each case, including any such transaction consummated prior to the Issue Date and any such transaction undertaken but not completed) and any charges or non-recurring merger costs incurred during such period as a result of any such transaction shall be excluded.

In addition, to the extent not already included in the Consolidated Net Income of such Person and its Restricted Subsidiaries, notwithstanding anything to the contrary in the foregoing, Consolidated Net Income shall include (i) the amount of proceeds actually received from business interruption insurance, (ii) other than for purposes of calculating the amount available for Restricted Payments under the Restricted Payments Basket, the amount of proceeds as to which the Issuer has determined there is reasonable evidence it will be reimbursed by the insurer in respect of such period from business interruption insurance (with a deduction for any amounts so added back to the extent denied by the applicable carrier in writing within 180 days or not so reimbursed within 365 days) and (iii) reimbursements of any expenses and charges pursuant to indemnification or other reimbursement provisions in connection with any investment or any sale, conveyance, transfer or other disposition of assets, in each case, permitted under the terms hereof.

Notwithstanding the foregoing, for the purpose of Section 4.10, there shall be excluded from Consolidated Net Income any dividends, repayments of loans or advances or other transfers of assets from Unrestricted Subsidiaries of the Issuer or a Restricted Subsidiary of the Issuer to the extent such dividends, repayments or transfers increase the amount of Restricted Payments permitted under Section 4.10(a)(3)(E).

"Consolidated Non-cash Charges" means, with respect to any Person for any period, the aggregate depreciation, amortization (including amortization of intangibles but excluding amortization of prepaid cash expenses that were paid in a prior period), impairment, compensation and other non-cash expenses of such Person and its Restricted Subsidiaries reducing Consolidated Net Income of such Person for such period on a consolidated basis and otherwise determined in accordance with GAAP; *provided* that if any non-cash charges referred to in this definition represent an accrual or reserve for potential cash items in any future period, the cash payment in respect thereof in such future period shall be subtracted from Consolidated EBITDA in such future period to such extent paid.

"Consolidated Taxes" means, with respect to any Person and its Restricted Subsidiaries on a consolidated basis for any period, provision for taxes based on income, profits or capital, including, without limitation, state franchise and similar taxes, and including an amount equal to the amount of tax distributions actually made to the holders of Capital Stock of such Person or any direct or indirect parent of such Person in respect of such period which shall be included as though such amounts had been paid as income taxes directly by such Person.

"Consolidated Total Assets" means, the consolidated total assets of the Issuer and its Restricted Subsidiaries as set forth on the consolidated balance sheet of the Issuer as of the most recent period for which financial statements were required to have been delivered pursuant to Section 4.16(a)(1); *provided* that, for purposes of testing the covenants under this Indenture in connection with any transaction, the Consolidated Total Assets of the Issuer and its Restricted Subsidiaries shall be adjusted to reflect such *pro forma* adjustments as are appropriate and consistent with the *pro forma* adjustment provisions set forth in the definition of "Consolidated Fixed Charge Coverage Ratio."

"Contingent Obligations" means, with respect to any Person, any obligation of such Person Guaranteeing any leases, dividends or other obligations that do not constitute Indebtedness ("primary obligations") of any other Person (the "primary obligor") in any manner, whether directly or indirectly, including, without limitation, any obligation of such Person, whether or not contingent:

- (1) to purchase any such primary obligation or any property constituting direct or indirect security therefor;
- (2) to advance or supply funds:
 - (a) for the purchase or payment of any such primary obligation; or
 - (b) to maintain working capital or equity capital of the primary obligor or otherwise to maintain the net worth or solvency of the primary obligor; or
- (3) to purchase property, securities or services primarily for the purpose of assuring the owner of any such primary obligation of the ability of the primary obligor to make payment of such primary obligation against loss in respect thereof.

"Contractual Obligation" means as to any Person, any provision of any security issued by such Person or of any agreement, instrument or other undertaking to which such Person is a party or by which it or any of its property is bound.

"Contribution Indebtedness" means Indebtedness of the Issuer or any Subsidiary Guarantor in an aggregate principal amount not greater than the aggregate amount of cash contributions (other than Excluded Contributions) made to the capital of the Issuer or such Subsidiary Guarantor after the Issue Date; provided that:

- (1) such cash contribution have not been used to make a Restricted Payment, and
- (2) such Contribution Indebtedness (a) is Incurred within 210 days after the making of such cash contributions and (b) is so designated as Contribution Indebtedness pursuant to an Officer's Certificate on the Incurrence date thereof.

"Controlling Fixed Asset Collateral Agent" means, (i) for so long as there is only one Series of Fixed Asset Obligations, the collateral agent for such Series, (ii) at any time when there is more than one Series of Fixed Asset Obligations, the "Controlling Collateral Agent", as such term is defined in the *Pari Passu Intercreditor Agreement*.

"Corporate Trust Office." means the office of the Trustee at which any time its corporate trust business in relation to this Indenture shall be administered, which at the date hereof is located at 535 Griswold Street, Suite 550, Detroit, Michigan 48226, Attention: Global Corporate Trust Services, and for purposes of Section 2.04 and Section 4.02(a) such office shall also mean the office or agency of the Trustee located at 100 Wall Street, Suite 1600, New York, New York 10005, Attention: Global Corporate Trust Services, or such other address as the Trustee may designate from time to time by notice to the Holders and the Issuer, or the principal corporate trust office of any successor Trustee (or such other address as such successor Trustee may designate from time to time by notice to the Holders and the Issuer).

"Covenant Defeasance." has the meaning set forth in Section 9.03.

"Covenant Suspension Event." has the meaning set forth in Section 4.17.

"Credit Facilities." means one or more debt facilities (including, without limitation, the ABL Credit Facility and the Term Loan Credit Facility) or other financing arrangements (including, without limitation, commercial paper facilities or indentures), providing for revolving credit loans, term loans or letters of credit or other Indebtedness, including any notes, mortgages, guarantees, collateral documents, instruments and agreements executed in connection therewith, and any amendments, supplements, modifications, extensions, renewals, restatements, refundings, replacements, exchanges or refinancings thereof, in whole or in part, and any financing arrangements that amend, supplement, modify, extend, renew, restate, refund, replace, exchange or refinance any part thereof, including, without limitation, any such amended, supplemented, modified, extended, renewed, restated, refunding, replacement, exchanged or refinancing financing arrangement that increases the amount permitted to be borrowed or issued thereunder or alters the maturity thereof or adds the Issuer, Restricted Subsidiaries or Parent Entities as additional borrowers or guarantors thereunder and whether by the same or any other agent, trustee, lender or group of lenders, investors, holders or otherwise.

"Default." means any event, act or condition that, after notice or the passage of time or both, would be an Event of Default.

"Depository." means, with respect to the Global Notes, The Depository Trust Company or another Person designated as depository by the Issuer, which Person must be a clearing agency registered under the Exchange Act.

"Depository Custodian." means the Trustee as custodian with respect to the Global Notes or any successor entity thereto.

"Deposit Account." means "Deposit Account" as defined in the UCC.

"Designated Non-cash Consideration" means the Fair Market Value of non-cash Consideration received by Issuer or a Restricted Subsidiary in connection with an Asset Disposition that is designated as "Designated Non-cash Consideration" pursuant to an Officer's Certificate, setting forth the basis of such valuation, less the amount of cash or Cash Equivalents received in connection with a subsequent sale, redemption or payment of, on or with respect to such Designated Non-cash Consideration.

"Designated Preferred Stock" means Preferred Stock of the Issuer or Holdings or any other Parent Entity, as applicable (other than Excluded Equity), that is issued after the Issue Date for cash and is so designated as Designated Preferred Stock, pursuant to an Officer's Certificate, on the issuance date thereof, the cash proceeds of which are contributed to the capital of the Issuer (if issued by Holdings or any Parent Entity) and excluded from the Restricted Payment Basket.

"Disqualified Stock" means, with respect to any Person, any Capital Stock of such Person that, by its terms (or by the terms of any security into which it is convertible or for which it is redeemable or exchangeable), in each case, at the option of the holder thereof or upon the happening of any event:

- (1) matures or is mandatorily redeemable, pursuant to a sinking fund obligation or otherwise (other than as a result of a change of control or asset sale so long as any rights of the holders thereof upon the occurrence of a change of control or asset sale event shall be subject to the prior repayment in full of the Notes and all other Obligations that are accrued and payable),
- (2) is convertible or exchangeable for Indebtedness or Disqualified Stock, or
- (3) is redeemable at the option of the holder thereof, in whole or in part,

in each case, prior to 91 days after the Maturity Date of the Notes; provided, however, that only the portion of Capital Stock that so matures or is mandatorily redeemable, is so convertible or exchangeable or is so redeemable at the option of the holder thereof prior to such date shall be deemed to be Disqualified Stock; provided, further, however, that if such Capital Stock is issued to any employee or to any plan for the benefit of employees of the Issuer or its Subsidiaries or by any such plan to such employees, such Capital Stock shall not constitute Disqualified Stock solely because it may be required to be repurchased by the Issuer in order to satisfy applicable statutory or regulatory obligations or as a result of such employee's termination, death or disability; provided, further, that any class of Capital Stock of such Person that by its terms authorizes such Person to satisfy its obligations thereunder by delivery of Capital Stock that is not Disqualified Stock shall not be deemed to be Disqualified Stock.

The amount of any Disqualified Stock that does not have a fixed redemption, repayment or repurchase price redeemed, repaid or repurchased on any date on which the amount of such Disqualified Stock is to be determined pursuant to this Indenture ; provided, however, that if such Disqualified Stock could not be required to be redeemed, repaid or repurchased at the time of such determination, the redemption, repayment or repurchase price will be the book value of such Disqualified Stock as reflected in the most recent financial statements of such Person .

"Domestic Subsidiary" means a Restricted Subsidiary that is not a Foreign Subsidiary .

"DTC" means the Depository Trust Company.

"Dutch Guarantor" means Cooper-Standard Latin America B.V.

"Enforcement Notice" means a written notice delivered, at a time when a ABL Default or Fixed Asset Default has occurred and is continuing, by either (a) in the case of a ABL Default , the ABL Collateral Agent to the Controlling Fixed Asset Collateral Agent or (b) in the case of a Fixed Asset Default , the Controlling Fixed Asset Collateral Agent to the ABL Collateral Agent , in each case, announcing that an Enforcement Period has commenced, specifying the relevant event of default, stating the current balance of the ABL Obligations or the Fixed Asset Obligations , as applicable, and requesting prompt notification of the current balance of the Fixed Asset Obligations or the ABL Obligations , as applicable, owing to the noticed party.

"Enforcement Period" means the period of time following the receipt by either the ABL Collateral Agent or the Controlling Fixed Asset Collateral Agent of an Enforcement Notice until the earliest of (i) in the case of an Enforcement Period commenced by the Controlling Fixed Asset Collateral Agent , the discharge of Fixed Asset Obligations pursuant to the Relative Priority Intercreditor Agreement , (ii) in the case of an Enforcement Period commenced by the ABL Collateral Agent , the discharge of ABL Obligations pursuant to the Relative Priority Intercreditor Agreement , (iii) the ABL Collateral Agent or the Controlling Fixed Asset Collateral Agent (as applicable) agrees in writing to terminate the Enforcement Period , or (iv) the date on which the ABL Default or the Fixed Asset Default that was the subject of the Enforcement Notice relating to such Enforcement Period has been cured to the satisfaction of the ABL Collateral Agent or the Controlling Fixed Asset Collateral Agent , as applicable, or waived in writing in accordance with the requirements of the applicable Notes Security Documents .

"Equity Interests" of any Person means (1) any and all shares or other equity interests (including common stock, preferred stock, limited liability company interests and partnership interests) in such Person and (2) all rights to purchase, warrants or options (whether or not currently exercisable), participations or other equivalents of or interests in (however designated) such shares or other interests in such Person , but excluding any debt securities that are convertible into such shares or other interests in such Person .

"Equity Offering" means a public or private sale or issuance of common stock of the Issuer or any Parent Entity of the Issuer, other than (i) public offerings with respect to common stock of the Issuer or any of its Parent Entities registered on Form S-4 or Form S-8 or (ii) any sale to any Restricted Subsidiary of Parent.

"Event of Default" has the meaning set forth in Section 6.01.

"Excess Proceeds" has the meaning set forth in Section 4.08.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Commission promulgated thereunder.

"Excluded Assets" means:

- (1) any interest in leased real property;
 - (2) any fee interest in owned real property which is not a Material Real Property ;
 - (3) any property or asset to the extent that the grant of a security interest in such property or asset is prohibited by applicable law, rule or regulation or requires a consent not obtained of any governmental authority pursuant to any Contractual Obligation, applicable law, rule or regulation;
 - (4) Subject Property ;
 - (5) any assets or property of the Issuer or any Restricted Subsidiary that is subject to a Lien under clause (5) of Section 4.13(b) (solely as it relates to Indebtedness Incurred pursuant to Section 4.09(b)(11)) or capital lease permitted under this Indenture to the extent the documents relating to such Lien or capital lease would not permit such assets or property to be subject to the Liens created under the Notes Security Documents ; *provided* that immediately upon the termination of any such restriction, such assets or property shall cease to be "Excluded Assets ";
 - (6) any vehicles and any other assets subject to certificate of title;
 - (7) any intellectual property, including any United States intent-to-use trademark applications, to the extent and for so long as the creation of a security interest therein would invalidate the Issuer's or such Guarantor's right, title or interest therein;
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(8) assets (x) to the extent a security interest in such assets would result in costs or consequences as reasonably determined by the Issuer with respect to the granting or perfecting of a security interest that is excessive in view of the benefits to be obtained by the Holder s or (y) to the extent a security interest in such assets would result in adverse tax consequences (including as a result of the operation of Section 956 of the Code or any similar law or regulation in any applicable jurisdiction) as reasonably determined by the Issuer (it being understood that none of the Issuer or its Subsidiaries shall be required to enter into any security agreements or pledge agreements governed under foreign law);

(9) Excluded Capital Stock ;

(10) Excluded Deposit Account s ;

(11) Letter-of-credit rights with a value not in excess of \$7.5 million (except for letter-of-credit rights that are perfected by filing UCC financing statements);

(12) Commercial tort claims with a value not in excess of \$7.5 million; and

(13) proceeds and products from any and all of the foregoing excluded collateral described in clauses (1) through (12), unless such proceeds or products would otherwise constitute Fixed Asset Collateral ;

provided, however, that Excluded Assets will not include any proceeds, substitutions or replacements of any Excluded Assets referred to in clauses (1) through (13) (unless such proceeds, substitutions or replacements would otherwise constitute Excluded Assets).

"Excluded Capital Stock" shall mean (a) any Capital Stock with respect to which the Issuer reasonably determines (in consultation with the Term Loan Credit Facility Collateral Agent) that the costs (including any costs resulting from adverse tax consequences) of pledging such Capital Stock shall be excessive in view of the benefits to be obtained by the Holder s therefrom and (b) (1) solely in the case of any pledge of Capital Stock of any Subsidiary that either is a CFC or a FSHCO to secure the Obligations , any Capital Stock that is Voting Stock of such Subsidiary in excess of 65% of the outstanding voting Capital Stock of such class, (2) any Capital Stock to the extent the pledge thereof would be prohibited by any applicable law, rule or regulation, (3) the Capital Stock of any Subsidiary that is not a Wholly Owned Subsidiary of the Issuer and the Guarantor s at the time such Subsidiary becomes a Subsidiary (for so long as such Subsidiary remains a non-Wholly Owned Subsidiary) to the extent the pledge of such Capital Stock by the Issuer or Guarantor is prohibited by the terms of such Subsidiary 's organizational or joint venture documents, (4) the Capital Stock of any Subsidiary of (x) a CFC or (y) a FSHCO and (5) the Capital Stock of any Unrestricted Subsidiary .

"Excluded Contributions" means cash and Cash Equivalents received by the Issuer after the Issue Date from;

- (1) contributions to its common equity capital; and
- (2) the sale of Qualified Equity Interests of the Issuer ;

in each case, designated as Excluded Contributions pursuant to an Officer 's Certificate executed by an officer of the Issuer , the cash proceeds of which are excluded from the calculation set forth in Section 4.10(a)(3)(B).

"Excluded Deposit Account s " means the following Deposit Account s: (A) Deposit Account s of any of the Issuer or any Guarantor exclusively used for payroll, payroll taxes or employee benefits, (B) cash accounts of any of the Issuer or any Guarantor the average daily balance in any month which does not exceed more than the U.S. Dollar Equivalent of \$100,000 at any time for any single account, and not more than \$500,000 for all accounts in the aggregate at any time and (C) accounts solely containing identifiable proceeds of assets of Holdings or any of its Subsidiaries not constituting ABL Collateral .

"Excluded Equity " means (i) Disqualified Stock , (ii) any Equity Interests sold to a Restricted Subsidiary of the Issuer or any employee stock ownership plan or trust established by the Issuer or any of its Subsidiaries (to the extent such employee stock ownership plan or trust has been funded by the Issuer or any Restricted Subsidiary) and (iii) any Equity Interest that has already been used or designated as (or the proceeds of which have been used or designated as) Excluded Contributions or otherwise used to increase the amounts available under Sections 4.10(b)(2) and 4.10(b)(3) or clause (13) of the definition of "Permitted Investment ."

"Existing Notes " means the Issuer 's \$400.0 million aggregate amount of senior notes due 2026 issued pursuant to the Existing Notes Indenture .

"Existing Notes Indenture " means the indenture, dated as of November 2, 2016, by and among the Issuer , the guarantors party thereto and U.S. Bank National Association, as trustee.

"Fair Market Value " means the value that would be paid by a willing buyer to an unaffiliated willing seller in a transaction not involving distress or necessity of either party, determined in good faith by the Issuer .

"Fiscal Year " means the fiscal year of the Issuer , which at the date hereof ends on December 31.

"Fixed Asset Collateral" means all equipment, real property, intellectual property, Capital Stock of subsidiaries, in each case, of the Issuer or a Guarantor and all other Collateral other than ABL Collateral (and for the avoidance of doubt, shall not include ABL Foreign Collateral).

"Fixed Asset Debt" means:

- (1) Indebtedness represented by the Notes initially issued by the Issuer under this Indenture on the Issue Date ;
- (2) Term Loan Debt ;

(3) any other Indebtedness of the Issuer or any Guarantor (including Additional Notes but, for the avoidance of doubt, excluding ABL Debt) that is intended by the Issuer to be secured equally and ratably with the Fixed Asset Obligations by a Fixed Asset Lien that is permitted to be incurred and secured by a Fixed Asset Lien under this Indenture ; provided that in the case of any Indebtedness referred to in this clause (3), the Fixed Asset Representative of such Indebtedness becomes a party to the Intercreditor Agreements in accordance with the terms thereof; and

- (4) guarantees by any Restricted Subsidiary in respect of any of the Obligations described in the foregoing clauses (1) through (3).

"Fixed Asset Default" means an "Event of Default " or equivalent term under any Fixed Asset Security Documents governing Fixed Asset Obligations .

"Fixed Asset Documents" means, collectively, the Term Loan Documents and the Notes Documents .

"Fixed Asset Lien" means a Lien granted to the Fixed Asset Representative for the benefit of the holders of Fixed Asset Obligations , at any time, upon the Collateral to secure Fixed Asset Obligations .

"Fixed Asset Non-U.S. Pledged Collateral" means 65% of the voting Equity Interests (and 100% of the non-voting Equity Interests) of (x) Foreign Subsidiaries that are CFC s or (y) FSHCO s that, in either case, are directly or indirectly owned by the Issuer or a Guarantor .

"Fixed Asset Obligations" means Fixed Asset Debt and all other Obligations in respect thereof.

"Fixed Asset Representative" means (1) the Collateral Agent , in the case of the Notes , (2) the Term Loan Credit Facility Collateral Agent , in the case of the Term Loan Credit Facility , and (3) in the case of any other series of Fixed Asset Debt , the trustee, agent or representative of the holders of such series of Fixed Asset Debt who is appointed as a representative of such series of Fixed

Asset Debt (for purposes related to the administration of the applicable security documents related thereto) pursuant to the indenture, credit agreement or other agreement governing such series of Fixed Asset Debt .

"Fixed Asset Security Documents " means the Notes Security Documents and the Term Loan Security Documents .

"Foreign Collateral " means the Foreign Grantors Collateral and the Non-U.S. Pledged Equity (other than the Fixed Asset Non-U.S. Pledged Collateral), if any; provided that, notwithstanding anything herein to the contrary, in no event shall Foreign Collateral include any Collateral that was pledged to secure Fixed Asset Obligations as a result of a Foreign Subsidiary or FSHCO being designated as a Guarantor under the Notes Security Documents .

"Foreign Grantors Collateral " means any asset of a Subsidiary Guarantor that is not a Domestic Subsidiary or is a FSHCO .

"Foreign Subsidiary " means a Restricted Subsidiary not organized or existing under the laws of the United States of America, any state thereof or the District of Columbia thereof and any direct or indirect Subsidiary of such Restricted Subsidiary .

"Four-Quarter Period " has the meaning set forth in the definition of "Consolidated Fixed Charge Coverage Ratio ."

"FSHCO " shall mean any Domestic Subsidiary that has no material assets other than (i) Equity Interests (or Equity Interests and Indebtedness) in one or more Foreign Subsidiaries of the Issuer that are CFC s or (ii) Equity Interests (or Equity Interests and Indebtedness) in one or more Domestic Subsidiaries of the Issuer that hold no material assets other than the assets described in clause (i) of this definition.

"GAAP " means generally accepted accounting principles set forth in the opinions and pronouncements of the Accounting Principles Board of the American Institute of Certified Public Accountants and statements and pronouncements of the Financial Accounting Standards Board or in such other statements by such other entity as may be approved by a significant segment of the accounting profession of the United States, which are in effect from time to time.

If there occurs a change in generally accepted accounting principles occurring after the Issue Date and such change would cause a change with respect to any term or measure used in this Indenture (an "Accounting Change "), then the Issuer may elect, as evidenced by a written notice of the Issuer to the Trustee , that such term or measure shall be calculated as if such Accounting Change had not occurred.

"Global Note Legend" means the legend substantially in the form set forth in Exhibit C.

"Global Notes" has the meaning set forth in Section 2.16.

"Guarantee" means a guarantee (other than by endorsement of negotiable instruments for collection in the ordinary course of business), direct or indirect, in any manner (including, without limitation, through letters of credit and reimbursement agreements in respect thereof), of all or any part of any Indebtedness. "Guarantee" when used as a verb shall have a corresponding meaning.

"Guarantor" means:

- (1) Holdings ;
- (2) each Subsidiary that executes and delivers a Note Guarantee pursuant to Section 4.15; and
- (3) each Subsidiary that otherwise executes and delivers a Note Guarantee (whether required to or opts to become a Guarantor);

in each case, until such time as such Person is released from its Note Guarantee in accordance with the provisions of this Indenture .

"Hedging Agreement" means, with respect to any Person , any:

- (1) currency exchange, interest rate or commodity swap agreements, currency exchange, interest rate or commodity cap agreements and currency exchange, interest rate or commodity collar agreements; and
- (2) other agreements or arrangements designed to protect such Person against fluctuations in currency exchange, interest rates or commodity prices.

"Hedging Obligations" means, with respect to any Person , the Obligations of such Person under any Hedging Agreement .

"Holder" or "Noteholder" means any registered holder, from time to time, of any Notes .

"Holdings" means CS Intermediate HoldCo 1 LLC.

"Incur" means issue, assume, Guarantee, incur, acquire or otherwise become liable (contingently or otherwise) for; provided, however, that any Indebtedness of a Person existing at the time such Person becomes a Restricted Subsidiary (whether by merger, consolidation, acquisition or otherwise) shall be deemed to be Incurred by such Person at the time it becomes a Restricted Subsidiary. The term "Incurrence" when used as a noun shall have a correlative meaning. Solely for purposes of determining compliance with Section 4.09:

- (1) amortization of debt discount or the accretion of principal with respect to a non-interest bearing or other discount security;
- (2) the payment of regularly scheduled interest in the form of additional Indebtedness of the same instrument or the payment of regularly scheduled dividends on Capital Stock in the form of additional Capital Stock of the same class and with the same terms; and
- (3) the obligation to pay a premium in respect of Indebtedness arising in connection with the issuance of a notice of redemption or making of a mandatory offer to purchase such Indebtedness;

will not be deemed to be the Incurrence of Indebtedness.

"Indebtedness" of any Person at any date means, without duplication:

- (1) the principal and premium (if any) of any indebtedness of such Person, whether or not contingent, (a) in respect of borrowed money, (b) evidenced by bonds, Notes, debentures or similar instruments or reimbursement obligations in respect of letters of credit or bankers' acceptances, (c) representing the deferred and unpaid purchase price of any property, except (i) any such balance that constitutes a trade payable, accrued expense or similar obligation to a trade creditor, in each case, Incurred in the ordinary course of business and (ii) any earn-out obligations until such obligations becomes a liability on the balance sheet of such Person in accordance with GAAP, (d) in respect of Capitalized Lease Obligations, (e) representing any Hedging Obligations or (f) under or in respect of Permitted Receivables Financing, if and to the extent that any of the foregoing indebtedness (other than letters of credit and Hedging Obligations) would appear as a liability on a balance sheet (excluding the footnotes thereto) of such Person prepared in accordance with GAAP;
 - (2) to the extent not otherwise included, any obligation of such Person to be liable for, or to pay, as obligor, guarantor or otherwise, on the Indebtedness of another Person (other than by endorsement of negotiable instruments for collection in the ordinary course of business); and
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(3) to the extent not otherwise included, Indebtedness of another Person secured by a Lien on any asset owned by such Person (whether or not such indebtedness is assumed by such Person); *provided, however*, that the amount of such Indebtedness will be the lesser of: (a) the Fair Market Value of such asset at such date of determination, and (b) the amount of such Indebtedness of such other Person ;

provided that Contingent Obligations incurred in the ordinary course of business shall not be deemed to constitute Indebtedness .

"Indenture." means this Indenture as amended, restated or supplemented from time to time.

"Initial Purchasers ." means BofA Securities, Inc., Goldman, Sachs & Co. LLC and Deutsche Bank Securities Inc.

"Intercreditor Agreements ." means the Relative Priority Intercreditor Agreement and the Pari Passu Intercreditor Agreement .

"Interest Payment Date ." means the stated maturity of an installment of interest on the Notes .

"Investment ." means any direct or indirect advance, loan (other than advances to customers in the ordinary course of business that are recorded as accounts receivable on the balance sheet of the lender) or other extensions of credit (including by way of Guarantee or similar arrangement) or capital contribution (by means of any transfer of cash or other property to others or any payment for property or services for the account or use of others), or any purchase or acquisition of Capital Stock , Indebtedness or other similar instruments by a Person in another Person . Except as otherwise provided for herein, the amount of an Investment shall be its Fair Market Value at the time the Investment is made and without giving effect to subsequent changes in value.

For purposes of the definition of "Unrestricted Subsidiary ," the definition of "Restricted Payment " and Section 4.10:

(1) "Investment " shall include the portion (proportionate to the Issuer 's equity interest in such Subsidiary) of the Fair Market Value of the net assets of any Subsidiary of the Issuer at the time that such Subsidiary is designated an Unrestricted Subsidiary ; *provided, however*, that upon a redesignation of such Subsidiary as a Restricted Subsidiary , the Issuer shall be deemed to continue to have a permanent "Investment " in an Unrestricted Subsidiary equal to an amount (if positive) equal to (A) the Issuer 's "Investment " in such Subsidiary at the time of such designation less (B) the portion (proportionate to the Issuer 's equity interest in such Subsidiary) of the Fair Market Value of the net assets of such Subsidiary at the time of such redesignation; and

(2) any property transferred to or from an Unrestricted Subsidiary shall be valued at its Fair Market Value at the time of such transfer.

"Investment Grade Rating" means a rating equal to or higher than Baa3 (or the equivalent) by Moody's and BBB- (or the equivalent) by S&P, in each case, with stable outlook, or an equivalent rating by any other Rating Agency.

"Issue Date" means May 29, 2020, the date on which Notes were first issued under this Indenture.

"Issuer Order" means a written request or order signed on behalf of the Issuer by an Officer of the Issuer and delivered to the Trustee.

"Junior Indebtedness" means Indebtedness that is either (i) unsecured or (ii) secured solely by Collateral with a Lien having Junior Lien Priority on the Collateral relative to the Fixed Asset Obligations. For the avoidance of doubt, ABL Debt shall not constitute Junior Indebtedness.

"Junior Lien Priority" means relative to specified Indebtedness, having a junior Lien priority on specified Collateral and either subject to the Relative Priority Intercreditor Agreement on a basis that is no more favorable than the provisions applicable to the holders of ABL Debt (in the case of Fixed Asset Collateral) or subject to intercreditor agreements providing holders of Indebtedness with Junior Lien Priority at least the same rights and obligations as the holders of ABL Debt (in the case of the Fixed Asset Collateral) have pursuant to the Relative Priority Intercreditor Agreement as to the specified Collateral.

"Legal Defeasance" has the meaning set forth in Section 9.02.

"Legal Holiday" has the meaning set forth in Section 12.07.

"Lien" means, with respect to any property or assets, any mortgage or deed of trust, pledge, hypothecation, assignment, deposit arrangement, security interest, lien, charge, easement (other than any easement not materially impairing usefulness or marketability), encumbrance, preference, priority or other security agreement of any kind or nature whatsoever on or with respect to such property or assets (including, without limitation, any conditional sale or other title retention agreement having substantially the same economic effect as any of the foregoing); provided that in no event shall an operating lease, in and of itself, be deemed to constitute a Lien.

"Losses" has the meaning set forth in Section 7.07.

"Make-Whole Premium" means, with respect to a Note at any Make-Whole Redemption Date, an amount equal to the greater of (i) 1.0% of the principal amount of such Note and (ii) the excess, if any, of (x) the present value at such Make-Whole Redemption Date of (A) the redemption price of such Note on June 1, 2022 (such redemption price being set forth in the table appearing in paragraph 5 of the Notes), *plus* (B) all required remaining interest payments due on such Note through June 1, 2022 (excluding accrued and unpaid interest to such Make-Whole Redemption Date), computed by the Issuer on a semi-annual basis (assuming a 360-day year consisting of twelve 30-day months) using a discount rate equal to the Applicable Treasury Rate on such Make-Whole Redemption Date plus 0.50%, over (y) the outstanding principal amount of such Note.

"Make-Whole Redemption" has the meaning set forth in paragraph 5 of the Notes.

"Make-Whole Redemption Date" with respect to a redemption at the Make-Whole Premium, means the date such redemption is effectuated.

"Material Real Property" means any parcel of real property for which there is a mortgage on such real property in favor of the Term Loan Credit Facility Collateral Agent and the lenders under the Term Loan Credit Facility and any other parcel of real property (other than a parcel with a Fair Market Value of less than (a) in the case of any such real property located in the State of Tennessee, \$15 million and (b) in any other case, \$7.5 million) owned in fee by the Issuer or any Guarantor.

"Maturity Date" when used with respect to any Note, means the date on which the principal amount of such Note becomes due and payable as therein or herein provided.

"Moody's" means Moody's Investors Service, Inc. and any successor to its rating agency business.

"Mortgage" means, collectively, the deeds of trust, trust deeds and mortgages, in each case, as may be amended from time to time, made by the Issuer or any of the Guarantors in favor or for the benefit of the Collateral Agent on behalf of the Trustee and the Holders (with such changes as may be customary to account for local law matters) in form and substance reasonably satisfactory to the Collateral Agent and the Issuer.

"Net Available Cash" from an Asset Disposition means cash proceeds received by the Issuer or a Restricted Subsidiary therefrom (including any cash payments received by way of deferred payment of principal pursuant to a note or installment receivable or otherwise, but only as and when received, but excluding any other consideration received in the form of assumption by the acquiring Person of Indebtedness or other obligations relating to such properties or assets or received in any other noncash form), in each case, net of:

(1) all legal, accounting, investment banking, title and recording tax expenses, commissions and other fees (including financial and other advisory fees) and expenses incurred, and all Federal, state, provincial, foreign and local taxes required to be paid or accrued as a liability under GAAP , and any relocation expenses incurred, relating to or as a result of such Asset Disposition ;

(2) all payments made on any Indebtedness which is secured by any assets subject to such Asset Disposition , in accordance with the terms of any Lien upon or other security agreement of any kind with respect to such assets, or which must by its terms, or in order to obtain a necessary consent to such Asset Disposition , or by applicable law, be repaid out of the proceeds from such Asset Disposition , or any costs associated with unwinding any related Hedging Obligations ;

(3) all distributions and other payments required to be made to non-controlling interest holders in Subsidiaries or joint ventures as a result of such Asset Disposition ; and

(4) appropriate amounts provided by the seller as a reserve, in accordance with GAAP , against any liabilities associated with the property or other assets disposed in such Asset Disposition and retained by the Issuer or any Restricted Subsidiary after such Asset Disposition , including, without limitation, pension and other post-employment benefit liabilities and liabilities related to environmental matters or against any indemnification obligations associated with such transaction.

"Net Income " means, with respect to any Person , the net income (loss) attributable to such Person , determined in accordance with GAAP and before any reduction in respect of Preferred Stock dividends.

"Non-Guarantor Subsidiary " means any Subsidiary of the Issuer that is not a Guarantor .

"Non-U.S. Person " means a Person who is not a U.S. Person .

"Non-U.S. Pledged Equity " means Equity Interests issued by any Foreign Subsidiary that is a CFC or a FSHCO .

"Note Guarantee " means the Guarantee by each Guarantor of the Issuer 's obligations under this Indenture and the Notes , pursuant to the provisions of this Indenture .

"Notes " means the 13.000% Senior Secured Notes due 2024 issued by the Issuer pursuant to this Indenture . The Notes issued on the Issue Date and the Additional Notes shall be treated as a single class for all purposes under this Indenture , and unless the context otherwise requires, all references to the Notes shall include the Notes issued on the Issue Date and any Additional Notes .

"Notes Documents" means, collectively, this Indenture, the Notes, the Intercreditor Agreements and the security documents related to the foregoing.

"Notes Security Documents" means the Intercreditor Agreements, each joinder or amendment to the Intercreditor Agreements, any other intercreditor agreements, the Security Agreement, the Mortgage s, and all other security agreements, pledge agreements, collateral assignments, mortgages, deeds of trust, security deeds, deeds to secure debt, hypothecs, hypothecations, collateral agency agreements, debentures or other instruments or other pledges, grants or transfers for security or agreements related thereto executed and delivered by the Issuer or any Guarantor creating or perfecting (or purporting to create or perfect) a Lien upon Collateral (including, without limitation, financing statements under the UCC) in favor of the Collateral Agent on behalf of the Trustee and the Holder s to secure the Notes and the Note Guarantee s, in each case, as amended, modified, renewed, restated, supplemented or replaced, in whole or in part, from time to time, in accordance with its terms and this Indenture.

"Obligations" means all obligations of every nature from time to time owed to any claimholder or any of their Affiliate s, whether for principal, interest, fees, expenses, indemnification or otherwise and all guarantees of any of the foregoing, including all post-petition interest accrued or accruing (or which would, absent commencement of an insolvency or liquidation proceeding, accrue) after commencement of an insolvency or liquidation proceeding in accordance with the rate specified in the relevant instrument evidencing Indebtedness whether or not the claim for such post-petition interest is allowed as a claim in such insolvency or liquidation proceeding.

"Offer" has the meaning set forth in Section 4.08.

"Offer ing Memorandum" means the Offer ing Memorandum of the Issuer, dated May 21, 2020, relating to the offering of the Notes issued on the Issue Date.

"Officer" means the Chairman of the Board, the Chief Executive Officer, the President, the Chief Financial Officer, any Executive Vice President, Senior Vice President or Vice President, the Treasurer, the Secretary or the Assistant Secretary (or any person serving the equivalent function of any of the foregoing) of a Person (or of any direct or indirect parent, general partner, managing member or sole member of such Person) or any individual designated as an "Officer" for purposes of this Indenture by the Board of Directors of such Person (or the Board of Directors of any direct or indirect parent, general partner, managing member or sole member of such Person) and, with respect to the Dutch Guarantor, any managing board member or attorney authorized to represent the Dutch Guarantor.

"Officer's Certificate" means a certificate that meets the requirements set forth in this Indenture signed on behalf of the Issuer or any Parent Entity by an Officer of the Issuer or such Parent Entity and delivered to the Trustee or the Collateral Agent, as applicable; *provided* that, for the avoidance of doubt, the Trustee and/or the Collateral Agent shall be entitled to rely upon any such certificate without liability.

"Original Issue Discount Legend" means the legend substantially in the form set forth in Exhibit D.

"Opinion of Counsel" means a written opinion from legal counsel, who may be an employee of or counsel to the Issuer or any of its Restricted Subsidiaries or Parent Entities, or other counsel who is reasonably acceptable to the Trustee (which opinion may be subject to customary assumptions and exclusions); *provided* that, for the avoidance of doubt, the Trustee and/or the Collateral Agent shall be entitled to rely upon any such opinion without liability.

"Parent" means Cooper-Standard Holdings Inc.

"Parent Entity" means any Person that, with respect to another Person, owns 50% or more of the total voting power of the Voting Stock of such other Person. Unless the context otherwise requires, any references to Parent Entity refer to a Parent Entity of the Issuer.

"Pari Passu Indebtedness" means any Indebtedness of the Issuer or any Guarantor that ranks *pari passu* in right of payment with the Notes or the Note Guarantees, as applicable.

"Pari Passu Intercreditor Agreement" means that certain intercreditor agreement, dated as of the Issue Date, by and between the Term Loan Credit Facility Collateral Agent and the Collateral Agent, and acknowledged by the grantors from time to time party thereto, as may be amended, restated, supplemented or replaced, in whole or in part, from time to time.

"Paying Agent" has the meaning set forth in Section 2.04.

"Payment Default" has the meaning set forth in Section 6.01.

"Permitted Asset Swap" means the substantially concurrent purchase and sale or exchange, including as a deposit for future purchases, of Related Business Assets or a combination of Related Business Assets and cash or Cash Equivalents between the Issuer or any of its Subsidiaries and another Person; *provided* that any cash or Cash Equivalents received must be applied in accordance with Section 4.08.

"Permitted Investment" means an Investment by the Issuer or any Restricted Subsidiary in:

- (1) the Issuer, a Restricted Subsidiary or a Person that will, upon the making of such Investment, become a Restricted Subsidiary; *provided* that in the case of any such Investment in a Restricted Subsidiary that is not a Guarantor, (i) the Issuer shall be able to Incur at least \$1.00 of additional Indebtedness pursuant to Section 4.09(a) and (ii) the aggregate amount of such Investments shall not exceed \$150.0 million at any one time outstanding; *provided further* that the foregoing clauses (i) and (ii) shall not apply to an Investment in a Restricted Subsidiary that is not a Guarantor by any other Restricted Subsidiary that is not a Guarantor;
 - (2) another Person if, as a result of such Investment, such other Person is merged or consolidated with or into, or transfers or conveys all or substantially all its assets to, the Issuer or a Restricted Subsidiary; *provided, however*, that such Person's primary business is a Related Business;
 - (3) cash and Cash Equivalents;
 - (4) receivables owing to, and recorded as accounts receivable on the balance sheet of, the Issuer or any Restricted Subsidiary if created or acquired in the ordinary course of business and payable or dischargeable in accordance with customary trade terms; *provided, however*, that such trade terms may include such concessionary trade terms as the Issuer or any such Restricted Subsidiary deems reasonable under the circumstances;
 - (5) payroll, travel and similar advances to cover matters that are expected at the time of such advances ultimately to be treated as expenses for accounting purposes and that are made in the ordinary course of business;
 - (6) loans or advances to employees, directors and officers of the Issuer or any of its Restricted Subsidiaries, in each case, in the ordinary course of business or to fund such Person's purchase of Capital Stock of the Issuer or any direct or indirect parent company thereof, not in excess of \$5.0 million outstanding at any one time in the aggregate;
 - (7) Investments received in satisfaction of judgments or in settlements of debt or compromises of obligations incurred in the ordinary course of business;
 - (8) the licensing or contribution of intellectual property pursuant to joint marketing arrangements with other Person;
-

(9) any Person to the extent such Investment represents the non-cash portion of the consideration received for (A) an Asset Disposition as permitted pursuant to Section 4.08 or (B) a disposition of assets not constituting an Asset Disposition ;

(10) any Person where such Investment was acquired by the Issuer or any of its Restricted Subsidiaries (A) in exchange for any other Investment or accounts receivable held by the Issuer or any such Restricted Subsidiary in connection with or as a result of a bankruptcy, workout, reorganization or recapitalization of the Issuer of such other Investment or accounts receivable or (B) as a result of a foreclosure by the Issuer or any of its Restricted Subsidiaries with respect to any secured Investment or other transfer of title with respect to any secured Investment in default;

(11) any Person to the extent such Investment s consist of prepaid expenses, negotiable instruments held for collection and lease, utility and workers' compensation, performance and other similar deposits made in the ordinary course of business by the Issuer or any Restricted Subsidiary ;

(12) any Person to the extent such Investment s consist of Hedging Obligations otherwise permitted under Section 4.09;

(13) any Person to the extent such Investment exists on the Issue Date , and any extension, modification or renewal of any such Investment s existing on the Issue Date , but only to the extent not involving additional advances, contributions or other Investment s of cash or other assets or other increases thereof (other than as a result of the accrual or accretion of interest or original issue discount or the issuance of pay in kind securities), in each case, pursuant to the terms of such Investment as in effect on the Issue Date ;

(14) Investment s the payment for which consists of Capital Stock of the Issuer (other than Disqualified Stock) or any direct or indirect parent company of the Issuer , as applicable; *provided, however*, that such Capital Stock will not increase the amount available for Restricted Payment s under the Restricted Payment s Basket ;

(15) Investment s in a Receivables Subsidiary or an Investment by an Receivables Subsidiary in any other Person as required by or in connection with Permitted Receivables Financing ;

(16) Investment s (including debt obligations and Capital Stock) received in connection with the bankruptcy or reorganization of suppliers and customers or in settlement of delinquent obligations of, or other disputes with, customers and suppliers arising in the ordinary course of business;

(17) additional Investment s by the Issuer or any of its Restricted Subsidiaries (including, but not limited to, joint ventures) having an aggregate Fair Market Value , taken together with all other Investment s made pursuant to this clause (17) that are at the time outstanding, not to exceed the greater of (x) \$100.0 million (with the Fair Market Value of each Investment being measured at the time made and without giving effect to subsequent changes in value) and (y) 4.00% of Consolidated Total Assets plus the amount of any unused portion of the amount of Investment s that may be made pursuant to clause (18) of this definition; *provided* that no Investment in an Unrestricted Subsidiary shall be made pursuant to this clause (17);

(18) Investment s in Permitted Joint Venture s of the Issuer or any of its Restricted Subsidiaries in an aggregate amount, taken together with all other Investment s made pursuant to this clause (18) that are at the time outstanding, not to exceed the greater of (x) \$100.0 million and (y) 4.00% of Consolidated Total Assets plus the amount of any unused portion of the amount of Investment s that may be made pursuant to clause (17) of this definition; *provided*, that the Investment s permitted pursuant to this clause (18) may be increased by the amount of distributions from Permitted Joint Venture s, without duplications of dividends or distributions increasing amounts available pursuant to the Restricted Payment s Basket ;

(19) Investment s in Unrestricted Subsidiaries having an aggregate Fair Market Value , taken together with all other Investment s made pursuant to the this clause (19) that are at that time outstanding, without giving effect to the sale of an Unrestricted Subsidiary to the extent the proceeds of such sale do not consist of cash, Cash Equivalents or marketable securities, not to exceed \$25,000,000, at the time of such Investment (with the Fair Market Value of each Investment being measured at the time made and without giving effect to subsequent changes in value), at any one time outstanding; *provided*, however, that any Investment pursuant to this clause (19) made in any Person that is an Unrestricted Subsidiary of the Issuer at the date of the making of such Investment and such Person becomes a Restricted Subsidiary after such date, such Investment shall thereafter be deemed to have been made pursuant to clause (1) above and shall cease to have been made pursuant to this clause (19) for so long as such Person continues to be a Restricted Subsidiary ; and

(20) any Investment ; *provided* that (x) no Default has occurred and is continuing or would result from such Investment and (y) on a pro forma basis after giving effect to such Investment , the Total Net Leverage Ratio would be equal to or less than 3.00:1.00.

Notwithstanding the foregoing, in no event shall any of the intellectual property of the Issuer or any of its Restricted Subsidiaries relating to the Fortrex platform be sold, conveyed, or otherwise transferred to any Unrestricted Subsidiary .

"Permitted Joint Venture" means, with respect to any specified Person, a joint venture in any other Person engaged in a Similar Business in respect of which the Issuer or a Restricted Subsidiary beneficially owns at least 10% of the shares of Equity Interests of such Person.

"Permitted Receivables Financing" means any transaction or series of transactions that may be entered into by the Issuer or any Restricted Subsidiary pursuant to which it may sell, convey, contribute to capital or otherwise transfer (which sale, conveyance, contribution to capital or transfer may include or be supported by the grant of a security interest) accounts receivable or interests therein and all collateral securing such receivables, all contracts and contract rights, purchase orders, security interests, financing statements or other documentation in respect of such receivables, any guarantees, indemnities, warranties or other obligations in respect of such receivables, any other assets that are customarily transferred or in respect of which security interests are customarily granted in connection with asset securitization transactions involving receivables similar to such receivables and any collections or proceeds of any of the foregoing (collectively, the "Receivables Assets") (i) to a trust, partnership, corporation or other Person (other than any Parent Entity or any of its Restricted Subsidiaries, other than a Restricted Subsidiary formed solely for the purpose of, and that engages only in, Permitted Receivables Financing, a "Receivables Subsidiary"), which transfer is funded in whole or in part, directly or indirectly, by the incurrence or issuance by the transferee or any successor transferee of Indebtedness, fractional undivided interests or other securities that are to receive payments from, or that represent interests in, the cash flow derived from such receivables and Receivables Assets or interests in such receivables and Receivables Assets, or (ii) directly to one or more investors or other purchasers (other than any Parent Entity or any of its Restricted Subsidiaries), it being understood that a Permitted Receivables Financing may involve (A) one or more sequential transfers or pledges of the same receivables and Receivables Assets, or interests therein (such as a sale, conveyance or other transfer to an Receivables Subsidiary followed by a pledge of the transferred receivables and Receivables Assets to secure Indebtedness incurred by the Receivables Subsidiary), and all such transfers, pledges and Indebtedness incurrences shall be part of and constitute a single Permitted Receivables Financing, and (B) periodic transfers or pledges of receivables and/or revolving transactions in which new receivables and Receivables Assets, or interests therein, are transferred or pledged upon collection of previously transferred or pledged receivables and Receivables Assets, or interests therein; *provided* that any such transactions shall provide for recourse to such Restricted Subsidiary (other than any Receivables Subsidiary) or the Issuer only in respect of the cash flows in respect of such receivables and Receivables Assets and to the extent of other customary securitization undertakings (as determined in good faith by the Board of Directors of the appropriate Receivables Subsidiary) in the jurisdiction relevant to such transactions; provided that, for the avoidance of doubt, (1) no portion of the Indebtedness or any other obligations (contingent or otherwise) of any Holdings or any of its Subsidiaries or Receivables Subsidiary is guaranteed by the Issuer or a Guarantor, is recourse to or obligates the Issuer or a Guarantor, or subjects any property or asset of the Issuer or a Guarantor, directly or indirectly (other than with respect to its equity ownership interest in any Subsidiary), contingently or otherwise, to the satisfaction of obligations incurred in such transactions; (2) neither the Issuer or any Guarantor has any obligation to maintain or preserve the financial condition of a Receivables Subsidiary or cause such entity to achieve certain levels of operating results and (3) the aggregate "amount" or "principal amount" (as defined below) of all Permitted Receivables

Financings (other than those of one or more Foreign Subsidiaries) shall not exceed \$50,000,000 at any time outstanding.

The "amount" or "principal amount" of any Permitted Receivables Financing shall be deemed at any time to be (1) the aggregate principal or stated amount of the Indebtedness , fractional undivided interests (which stated amount may be described as a "net investment" or similar term reflecting the amount invested in such undivided interest) or other securities incurred or issued pursuant to such Permitted Receivables Financing , in each case outstanding at such time, or (2) in the case of any Permitted Receivables Financing in respect of which no such Indebtedness , fractional undivided interests or securities are incurred or issued, the cash purchase price paid by the buyer in connection with its purchase of receivables less the amount of collections received in respect of such receivables and paid to such buyer, excluding any amounts applied to purchase fees or discount or in the nature of interest.

"Permitted Lien" has the meaning set forth in Section 4.13.

"Person" means an individual, partnership, corporation, limited liability company, unincorporated organization, trust or joint venture, or a governmental agency or political subdivision thereof.

"Physical Notes" means certificated Notes in registered form that are not Global Notes .

"Preferred Stock" means, with respect to any Person , any and all preferred or preference stock or other Equity Interests (however designated) of such Person having a preference or priority over other Equity Interests (however designated) of such Person , whether now outstanding or issued after the Issue Date .

"premium" has the meaning set forth in Section 6.02.

"principal" of a Note means the principal of such Note plus the premium, if any, payable on such Note which is due or overdue or is to become due at the relevant time.

"Premises" means owned real properties required to be subject to a mortgage lien that forms a portion of the Collateral (including all after-acquired real property that is not an Excluded Asset).

"Principal Facility" means the land, land improvements, buildings and fixtures (to the extent they constitute real property interests) (including any leasehold interest therein), constituting corporate office, any manufacturing plant or any manufacturing facility and the machinery and equipment located thereon, which are owned, on the Issue Date or thereafter, by the Issuer or a Restricted Subsidiary and which have a net book value at the date as of which the determination is being made of in excess of one percent of the Consolidated Total Assets (including, for purposes of such calculation, the land, land improvements, buildings and such fixtures comprising such office, plant or facilities, as the case may be), other than any such land, land improvements, buildings and fixtures which, in the opinion of the Board of Directors of the Issuer (evidenced by a board resolution), is not of material importance to the business conducted by the Issuer and its Restricted Subsidiaries taken as a whole.

"Private Placement Legend" means the legend substantially in the form set forth in Exhibit B.

"Proceeds" means "Proceeds" as defined in the UCC.

"Pro Forma Cost Savings" means, without duplication of amounts added-back to calculate Consolidated EBITDA or otherwise being given pro forma effect, with respect to any period, the reductions in costs and other operating improvements or synergies that have been realized or are reasonably anticipated to be realized in good faith with respect to a pro forma event within twelve months of the date of such pro forma event and that are reasonably identifiable and factually supportable, as if all such reductions in costs and other operating improvements or synergies had been effected as of the beginning of such period, decreased by any recurring incremental expenses incurred or to be incurred during such Four-Quarter Period in order to achieve such reduction in costs; provided, that the aggregate amount of Pro Forma Cost Savings and the aggregate amount of cost savings, operating expense reductions and synergies added pursuant to clause (7) of the definition of "Consolidated EBITDA", when taken together, shall not exceed 20.0% of Consolidated EBITDA for such period (giving pro forma effect to the relevant transaction, other than any cost savings, synergies, operating expense reductions or Pro Forma Cost Savings) determined prior to giving effect to any adjustments pursuant to this definition or clause (7) of the definition of "Consolidated EBITDA".

"Qualified Equity Interests" of any Person means Equity Interests of such Person other than Disqualified Stock. Unless otherwise specified, Qualified Equity Interests refer to Qualified Equity Interests of the Issuer.

"Rating Agencies" means Moody's and S&P or if Moody's or S&P or both shall not make a rating on the Notes publicly available, a nationally recognized statistical rating agency or agencies, as the case may be, selected by the Issuer which shall be substituted for Moody's or S&P or both, as the case may be.

"Receivables Assets" has the meaning set forth in the definition of "Permitted Receivables Financing."

"Receivables Fees" means distributions or payments made directly or by means of discounts with respect to any participation interest issued or sold in connection with, and other fees paid to a Person that is not a Restricted Subsidiary in connection with, any Permitted Receivables Financing.

"Receivables Subsidiary" has the meaning set forth in the definition of "Permitted Receivables Financing."

"Redemption Date" when used with respect to any Note to be redeemed pursuant to paragraph 5 of the Notes means the date fixed for such redemption by or pursuant to the terms of this Indenture and the Notes.

"Redemption Premium" has the meaning set forth in Section 6.02.

"Refinance" means, in respect of any Indebtedness, to refinance, extend, renew, refund, repay, prepay, purchase, redeem, defease, replace, discharge or retire, or to issue other Indebtedness in exchange or replacement for, such Indebtedness. "Refinanced" and "Refinancing" shall have correlative meanings.

"Refinancing Indebtedness" has the meaning set forth in Section 4.09(b)(6).

"Registrar" has the meaning set forth in Section 2.04.

"Regulation S" means Regulation S promulgated under the Securities Act.

"Regulation S Global Note" has the meaning set forth in Section 2.16.

"Regulation S Legend" means the legend substantially in the form set forth in Exhibit E.

"Regulation S Notes" has the meaning set forth in Section 2.02.

"Related Business" means any business in which the Issuer or any of the Restricted Subsidiaries was engaged on the Issue Date and any business related, ancillary or complementary to such business.

"Related Business Assets" means assets (other than cash or Cash Equivalents) used or useful in a Similar Business; *provided* that any assets received by the Issuer or a Restricted Subsidiary in exchange for assets transferred by the Issuer or a Restricted Subsidiary will not be deemed to be Related Business Assets if they consist of securities of a Person, unless upon receipt of the securities of such Person, such Person would become a Restricted Subsidiary.

"Relative Priority Intercreditor Agreement" means that certain intercreditor agreement, dated as of the Issue Date , by and among the ABL Collateral Agent , the Term Loan Credit Facility Collateral Agent and the Collateral Agent , and acknowledged by the grantors from time to time party thereto, as may be amended, restated, supplemented or replaced, in whole or in part, from time to time.

"Required Currency" has the meaning set forth in Section 12.01.

"Responsible Officer" shall mean, when used with respect to the Trustee , any officer in the Corporate Trust Department of the Trustee including any vice president, assistant vice president or any other officer of the Trustee who customarily performs functions similar to those performed by the Person s who at the time shall be such officers, respectively, in each case, having direct responsibility for the administration of this Indenture , and any other officer to whom any corporate trust matter is referred because of such officer's knowledge of and familiarity with the particular subject.

"Restricted Global Note" means a Global Note bearing the Private Placement Legend .

"Restricted Investment" means an Investment other than a Permitted Investment .

"Restricted Payment" means any of the following:

(1) the declaration or payment of any dividend or the making of any distribution on account of the Issuer 's or any of its Restricted Subsidiaries ' Equity Interests , including any dividend, payment or distribution payable in connection with any merger or consolidation involving the Issuer other than: (A) dividends, payments or distributions by the Issuer payable solely in Qualified Equity Interests of the Issuer or in options, warrants or other rights to purchase such Equity Interests or (B) dividends, payments or distributions by a Restricted Subsidiary so long as, in the case of any dividend, payment or distribution payable on or in respect of any class or series of securities issued by a Restricted Subsidiary other than a wholly owned Restricted Subsidiary , the Issuer or a Restricted Subsidiary receives at least its pro rata share of such dividend, payment or distribution in accordance with its Equity Interests in such class or series of securities;

(2) the purchase, redemption, defeasance or other acquisition or retirement for value of any Equity Interests of the Issuer or Holdings or any other Parent Entity , including in connection with any merger or consolidation, in each case, held by a Person other than the Issuer or a Restricted Subsidiary ;

(3) the making of any voluntary or optional payment on or with respect to, or purchase, redemption, defeasance or other acquisition or retirement for value any Indebtedness of the Issuer or any Guarantor that is unsecured, secured by Lien s on the ABL Collateral and the Fixed Asset Collateral that are junior to the Lien s securing the Notes or contractually subordinated in right of payment to the Notes or to any Note Guarantee , except any such payment on Indebtedness permitted under Section 4.09(b)(2) and any payment of interest when due or principal at the Stated Maturity thereof or the purchase, redemption, repurchase, defeasance, acquisition or retirement for value of any such Indebtedness within 365 days of the Stated Maturity thereof; or

(4) the making of any Restricted Investment .

"Restricted Payment s Basket " has the meaning set forth in Section 4.10.

"Restricted Period " has the meaning set forth in Section 2.17.

"Restricted Physical Note " means a Physical Note bearing the Private Placement Legend .

"Restricted Subsidiary " means any Subsidiary of the Issuer that is not an Unrestricted Subsidiary .

"Reversion Date " has the meaning set forth in Section 4.17.

"Rule 144 " means Rule 144 promulgated under the Securities Act .

"Rule 144 A " means Rule 144 A promulgated under the Securities Act .

213 "Rule 144 A Global Note " has the meaning set forth in Section 2.16.

214 "Rule 144 A Notes " has the meaning set forth in Section 2.02.

"S&P " means Standard & Poor's Ratings Group and any successor to its rating agency business.

"Sale and Leaseback Transaction " means any sale or transfer made by the Issuer or one or more Restricted Subsidiaries (except a sale or transfer made to the Issuer or one or more Restricted Subsidiaries) of any Principal Facility that (in the case of a Principal Facility which is a building or equipment) has been in operation, use or commercial production (exclusive of test and start-up periods) by the Issuer or any Restricted Subsidiary for more than 180 days prior to such sale or transfer, or that (in the case of a Principal Facility that is a parcel of real property not containing a building) has been owned by the Issuer or any Restricted Subsidiary for more than 180 days prior to such sale or transfer, if such sale or transfer is made with the intention of leasing, or as part of an arrangement involving the lease of such Principal Facility to the Issuer or a Restricted Subsidiary

(except a lease for a period not exceeding 36 months made with the intention that the use of the leased Principal Facility by the Issuer or such Restricted Subsidiary will be discontinued on or before the expiration of such period); *provided, however*, that the creation of any Secured Debt permitted under Section 4.13 shall not be deemed to create or be considered a Sale and Leaseback Transaction .

"Secured Debt" means outstanding Indebtedness of the Issuer or a Restricted Subsidiary which is secured by (a) a Lien in any property or asset of the Issuer or any Restricted Subsidiary , or (b) a Lien in any shares of stock owned directly or indirectly by the Issuer in a Restricted Subsidiary . The securing in the foregoing manner of any previously unsecured Indebtedness shall be deemed to be the creation of Secured Debt at the time such security is given. The amount of Secured Debt at any time outstanding shall be the aggregate principal amount then owing thereon by the Issuer and the Restricted Subsidiaries .

"Securities Account" means "Securities Account " as defined in the UCC .

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations of the Commission promulgated thereunder.

"Security Agreement" means, collectively, that certain pledge and security agreement dated as of the Issue Date and executed by the Issuer , the Guarantor s and the Collateral Agent , together with each other security agreement and security agreement supplement executed and delivered pursuant to the Security Agreement .

"Senior Secured Net Leverage Ratio" means, as of the date of determination, the ratio of (a) the Total Debt of the Issuer and the Restricted Subsidiaries secured by a Lien to (b) Consolidated EBITDA of the Issuer and the Restricted Subsidiaries for the Four-Quarter Period ending immediately prior to such date. In the event that the Issuer or any Restricted Subsidiary incurs, redeems, retires, defeases or extinguishes any Total Debt (other than Indebtedness under a revolving credit facility unless such Indebtedness has been permanently paid and not replaced) subsequent to the commencement of the period for which the Senior Secured Net Leverage Ratio is being calculated but prior to or simultaneously with the event for which the calculation of the Senior Secured Net Leverage Ratio is made, then the Senior Secured Net Leverage Ratio shall be calculated giving pro forma effect to such incurrence, redemption, retirement, defeasance or extinguishment of Total Debt as if the same had occurred at the beginning of the applicable Four-Quarter Period . Notwithstanding anything to the contrary set forth in the definition of "Consolidated EBITDA " (and all component definitions referenced in such definitions), whenever pro forma effect is to be given to acquisition, disposition or incurrence, redemption, retirement, defeasance or extinguishment of Total Debt , the pro forma calculations shall be determined in good faith by a responsible officer of the Issuer .

"Series" means, (a) with respect to the holders of Fixed Asset Debt, each of (1) the Collateral Agent and the Holders (in their capacities as such), in the case of the Notes, (2) the Term Loan Credit Facility Collateral Agent and the holders of the Term Loan Obligations (in their capacities as such), in the case of the Term Loan Credit Facility, and (3) the holders of any other series of Fixed Asset Debt that become party to the Pari Passu Intercreditor Agreement and the trustee, agent or representative of the holders of such series of Fixed Asset Debt who is appointed as a representative of such series of Fixed Asset Debt (for purposes related to the administration of the applicable security documents related thereto) pursuant to the indenture, credit agreement or other agreement governing such series of Fixed Asset Debt (in their capacities as such) and (b) with respect to any Fixed Asset Obligations, each of (1) the Obligations in respect of the Notes, (2) the Term Loan Obligations and (3) the Obligations in respect of other Fixed Asset Debt which, pursuant to a joinder agreement, are to be represented under the Pari Passu Intercreditor Agreement by a common collateral agent (in its capacity as such for such other Fixed Asset Debt).

"Significant Subsidiary" means any Subsidiary that would be a "significant subsidiary" as defined in Article 1, Rule 1-02 of Regulation S-X, promulgated pursuant to the Securities Act, as such Regulation is in effect on the Issue Date.

"Similar Business" means any business conducted or proposed to be conducted by the Issuer or any of its Restricted Subsidiaries on the Issue Date and any business or other activities that are reasonably similar, ancillary, complementary or related thereto, or a reasonable extension, development or expansion thereof.

"Stated Maturity" means, with respect to any installment of interest or principal on any series of Indebtedness, the date on which such payment of interest or principal was scheduled to be paid in the documentation governing such Indebtedness, and shall not include any contingent obligations to repay, redeem or repurchase any such interest or principal prior to the date originally scheduled for the payment thereof.

"Subject Property" means any contract, license, lease, agreement, instrument or other document to the extent that such grant of a security interest therein is (1) prohibited by, or constitutes a breach or default under, or results in the termination of, or requires any consent not obtained under, such contract, license, lease, agreement, instrument or other document, or, in the case of any Equity Interests or other securities, any applicable shareholder or similar agreement or (2) otherwise constitutes or results in the abandonment, invalidation or unenforceability of any right, title or interest of the Issuer or any Guarantor under such contract, license, lease, agreement, instrument or other document, except, in each case, to the extent that applicable law or the term in such contract, license, lease, agreement, instrument or other document or shareholder or similar agreement providing for such prohibition, breach, default or termination or requiring such consent is ineffective under applicable law or purports to prohibit the granting of a security interest over all or a material portion of assets of the Issuer or any Guarantor; provided, however, that the foregoing exclusions shall not apply to the extent that any such prohibition, default or other term would be rendered ineffective pursuant to Section 9-406, 9-407, 9-408 or 9-409 of the UCC of any relevant jurisdiction or any other applicable

law or principles of equity; provided, further, that the security interest shall attach immediately to any portion of such Subject Property that does not result in any of the consequences specified above including, without limitation, any proceeds of such Subject Property .

"Subordinated Indebtedness" means Indebtedness of the Issuer or any Restricted Subsidiary that is expressly subordinated in right of payment to the Notes or the Note Guarantee s by the Issuer or such Restricted Subsidiary , as the case may be.

"Subordinated Obligation" means, with respect to a Person , any Indebtedness of such Person (whether outstanding on the Issue Date or thereafter Incurred) which is subordinate or junior in right of payment to the Notes , or a Subsidiary Guarantee of such Person , as the case may be, pursuant to a written agreement to that effect.

"Subsidiary" means a corporation, association, partnership, limited liability company or other entity of which more than 50% of the outstanding Voting Stock is owned, directly or indirectly, by a Person or by one or more other Subsidiaries of such Person , or by a Person and one or more other Subsidiaries of such Person . Unless otherwise specified, a Subsidiary refers to a Subsidiary of the Issuer .

"Subsidiary Guarantee" means a Guarantee by a Subsidiary Guarantor of the Issuer 's obligations with respect to the Notes and, to the extent permitted under Section 4.09, the related Additional Notes , if any.

"Subsidiary Guarantor" means, with respect to the Notes , a Guarantor that is a Restricted Subsidiary of the Issuer .

"Successor Company" has the meaning set forth in Section 5.01.

"Suspended Covenants" has the meaning set forth in Section 4.17.

"Suspension Date" has the meaning set forth in Section 4.17.

"Suspension Period" has the meaning set forth in Section 4.17.

"Taxes" has the meaning set forth in Section 2.19.

"Tax Group" has the meaning set forth in Section 4.10.

"Tax Jurisdiction" has the meaning set forth in Section 2.19.

"Term Loan Credit Facility Collateral Agent" means Deutsche Bank AG New York Branch and its successors and assigns in that capacity and any agent under any agreement that constitutes the Term Loan Credit Facility .

"Term Loan Credit Facility" means that certain credit agreement, dated as of April 4, 2014, by and among Holdings , the Issuer , Deutsche Bank AG New York Branch, as agent, and the lenders, agents and other parties party thereto, and including any related notes, guarantees, collateral documents, instruments and agreements executed in connection therewith, and, in each case, as amended, restated, supplemented, waived, renewed or otherwise modified from time to time, and (if designated by the Issuer) as replaced (whether or not upon termination, and whether with the original lenders or otherwise), restructured, repaid, refunded, refinanced or otherwise modified from time to time, including (if designated by the Issuer) any agreement or indenture or commercial paper facilities with banks or other institutional lenders or investors extending the maturity thereof, refinancing, replacing or otherwise restructuring all or any portion of the Indebtedness under such agreement or agreements or indenture or indentures or any successor or replacement agreement or agreements or indenture or indentures or adding Restricted Subsidiaries as additional borrowers or guarantors thereunder and whether by the same or any other agent, lender or group of lenders so long as, in all cases of the foregoing, the terms satisfy clauses (i)(y), (ii)(y), (iii) and (iv) of the conditions to "Refinancing Indebtedness ".

"Term Loan Credit Facility Loan Parties" means, collectively, Holdings , the Issuer and the other borrowers and guarantors from time to time party to the Term Loan Credit Facility .

"Term Loan Security Documents" means all security agreements, pledge agreements, collateral assignments, mortgages, deeds of trust, security deeds, deeds to secure debt, hypothecs, collateral agency agreements, debentures or other instruments, pledges, grants or transfers for security or agreements related thereto executed and delivered by the Issuer or any Guarantor creating or perfecting (or purporting to create or perfect) a Lien upon collateral (including, without limitation, financing statements under the UCC) in favor of the Term Loan Credit Facility Collateral Agent , for the benefit of any of the holders of Term Loan Debt in each case, as amended, modified, restated, supplemented or replaced, in whole or in part, from time to time, in accordance with its terms and the applicable Term Loan Documents subject to the terms of the Intercreditor Agreements , as applicable.

"Term Loan Debt" means:

(1) Indebtedness and other obligations incurred by the Term Loan Credit Facility Loan Parties under or in respect of the Term Loan Credit Facility and/or secured by the Term Loan Security Documents ; and

(2) guarantees by any Restricted Subsidiary in respect of any of the obligations described in clause (1).

"Term Loan Documents" means, collectively, the Term Loan Credit Facility, the Intercreditor Agreements and the credit agreement or other agreement governing other Term Loan Debt and the security documents related to the foregoing.

"Term Loan Obligations" means Term Loan Debt and all other Obligations in respect thereof.

"Third Party Claim" has the meaning set forth in Section 7.07.

"Total Debt" means, at any date of determination, the aggregate principal amount of all outstanding Indebtedness of the Issuer and the Restricted Subsidiaries determined on a consolidated basis, to the extent required to be recorded on a balance sheet in accordance with GAAP, consisting of Indebtedness for borrowed money, Capitalized Lease Obligations and debt obligations evidenced by promissory notes or similar instruments (other than letters of credit to the extent undrawn), minus the aggregate amount of unrestricted cash and Cash Equivalents held by the Issuer and its Restricted Subsidiaries as of the end of the most recent fiscal period in an amount not to exceed \$300.0 million.

"TIA" or "Trust Indenture Act" means the Trust Indenture Act of 1939, as amended.

"Total Net Leverage Ratio" means, as of the date of determination, the ratio of (a) the Total Debt of the Issuer and the Restricted Subsidiaries to (b) Consolidated EBITDA of the Issuer and the Restricted Subsidiaries for the Four-Quarter Period ending immediately prior to such date. In the event that the Issuer or any Restricted Subsidiary incurs, redeems, retires, defeases or extinguishes any Total Debt (other than Indebtedness under a revolving credit facility unless such Indebtedness has been permanently paid and not replaced) subsequent to the commencement of the period for which the Total Net Leverage Ratio is being calculated but prior to or simultaneously with the event for which the calculation of the Total Net Leverage Ratio is made, then the Total Net Leverage Ratio shall be calculated giving pro forma effect to such incurrence, redemption, retirement, defeasance or extinguishment of Total Debt as if the same had occurred at the beginning of the applicable Four-Quarter Period. Notwithstanding anything to the contrary set forth in the definition of "Consolidated EBITDA" (and all component definitions referenced in such definitions), whenever pro forma effect is to be given to acquisition, disposition or incurrence, redemption, retirement, defeasance or extinguishment of Total Debt, the pro forma calculations shall be determined in good faith by a responsible officer of the Issuer.

"Transfer" means to sell, assign, transfer, lease (other than pursuant to an operating lease entered into in the ordinary course of business), convey or otherwise dispose of, including by any Sale and Leaseback Transaction, consolidation, merger, liquidation, dissolution or otherwise, in one transaction or a series of transactions.

"Treasury Management Arrangement" means any agreement or other arrangement governing the provision of treasury or cash management services, including Deposit Accounts, overdraft, credit or debit card, funds transfer, automated clearinghouse, zero balance accounts, returned check concentration, controlled disbursement, lockbox, account reconciliation and reporting and trade finance services and other cash management services.

"Trustee" means the party named as such in this Indenture until a successor replaces it pursuant to this Indenture and thereafter means the successor.

"U.S. Dollar Equivalent" means with respect to any monetary amount in a currency other than U.S. dollars, at any time for determination thereof, the amount of U.S. dollars obtained by converting such foreign currency involved in such computation into U.S. dollars at the spot rate for the purchase of U.S. dollars with the applicable foreign currency as published in The Wall Street Journal in the "Exchange Rates" column under the heading "Currency Trading" on the date two Business Days prior to such determination.

"U.S. Government Obligations" means marketable direct obligations issued by, or unconditionally guaranteed as to full and timely payment by, the United States Government or issued by any agency or instrumentality thereof and backed by the full faith and credit of the United States of America that, in each case, mature within one year from the date of acquisition thereof and are not callable or redeemable at the option of the issuer thereof.

"U.S. Person" means a "U.S. person" as defined in Rule 902(k) under the Securities Act.

"UCC" means the Uniform Commercial Code (or any successor statute) as in effect from time to time in the relevant jurisdiction.

"Unrestricted Global Note" means a permanent Global Note, substantially in the form of Exhibit A hereto, with such appropriate insertions, omissions, substitutions and other variations as are required or not prohibited by this Indenture, bearing the Global Note Legend and that has the "Schedule of Exchange s of Interests in Global Note" attached thereto, and that is deposited with or on behalf of and registered in the name of the Depository, representing the Notes that do not bear the Private Placement Legend.

"Unrestricted Notes" means Unrestricted Global Notes and Unrestricted Physical Notes.

"Unrestricted Physical Note" means a Physical Note that does not bear and is not required to bear the Private Placement Legend .

"Unrestricted Subsidiary" means:

- (1) any Subsidiary of the Issuer that at the time of determination shall be designated an Unrestricted Subsidiary by the Board of Directors in the manner provided below; and
- (2) any Subsidiary of an Unrestricted Subsidiary .

The Board of Directors of the Issuer may designate any Subsidiary of the Issuer (including any newly acquired or newly formed Subsidiary) to be an Unrestricted Subsidiary unless such Subsidiary or any of its Subsidiaries owns any Capital Stock or Indebtedness of, or holds any Lien on any property of, the Issuer or any other Subsidiary of the Issuer that is not a Subsidiary of the Subsidiary to be so designated; provided, however, that either (A) the Subsidiary to be so designated has total assets of \$1,000 or less or (B) if such Subsidiary has assets greater than \$1,000, such designation would be permitted under Section 4.10.

The Board of Directors of the Issuer may designate any Unrestricted Subsidiary to be a Restricted Subsidiary ; provided, however, that immediately after giving effect to such designation (A) the Issuer could Incur \$1.00 of additional Indebtedness under Section 4.09(a) and (B) no Default shall have occurred and be continuing. Any such designation by the Board of Directors of the Issuer shall be evidenced to the Trustee by promptly filing with the Trustee a copy of the resolution of the Board of Directors of the Issuer giving effect to such designation and an Officer's Certificate certifying that such designation complied with the foregoing provisions.

"Voting Stock" means any class or classes of Capital Stock pursuant to which the holders thereof have power to vote in the election of directors, managers or trustees of any Person (irrespective of whether or not, at the time, stock of any other class or classes shall have, or might have, voting power by reason of the happening of any contingency).

"Weighted Average Life to Maturity" means, when applied to any Indebtedness or Disqualified Stock , as the case may be, at any date, the quotient obtained by dividing (1) the sum of the products of the number of years from the date of determination to the date of each successive scheduled principal payment of such Indebtedness or redemption or similar payment with respect to such Disqualified Stock multiplied by the amount of such payment, by (2) the sum of all such payments.

"Wholly Owned Subsidiary" of any Person means a Subsidiary of such Person all of the outstanding Capital Stock or other ownership interests of which (other than directors' qualifying shares) shall at the time be owned by such Person or by one or more Wholly Owned Subsidiaries of such Person or by such Person and one or more Wholly Owned Subsidiaries of such Person .

Section 1.02 [Reserved].

Section 1.03 Rules of Construction.

Unless the context otherwise requires:

- (1) a term has the meaning assigned to it herein, whether defined expressly or by reference;
 - (2) "or" is not exclusive;
 - (3) words in the singular include the plural, and in the plural include the singular;
 - (4) words used herein implying any gender shall apply to both genders;
 - (5) "herein," "hereof" and other words of similar import refer to this Indenture as a whole and not to any particular Article, Section or other subsection;
 - (6) unless otherwise specified herein, all accounting terms used herein shall be interpreted, all accounting determinations hereunder shall be made, and all financial statements required to be delivered hereunder shall be prepared in accordance with GAAP ;
 - (7) "\$" and "U.S. Dollars" each refer to United States dollars, or such other money of the United States of America that at the time of payment is legal tender for payment of public and private debts;
 - (8) "will" shall be interpreted to express a command;
 - (9) "including" means including without limitation; and
 - (10) so long as a Guarantor that is a Parent Entity of the Issuer does not hold any material assets other than, directly or indirectly, the Equity Interests of the Issuer (as determined in good faith by the Board of Directors or senior management of such Parent Entity), any calculations or measure that is determined with reference to the Issuer 's financial statements (including, without limitation, Consolidated EBITDA , Consolidated Interest Expense , Consolidated Net Income , Senior Secured Net Leverage Ratio , Total Net Leverage Ratio , Consolidated Fixed Charge Coverage Ratio , Consolidated Fixed Charges , Permitted Receivables Financing , Consolidated Total Assets and the Restricted Payment s Basket may be determined with reference to such Parent Entity 's financial statements instead.
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ARTICLE II

THE SECURITIES

Section 2.01 Amount of Notes.

The Trustee shall initially authenticate \$250,000,000 aggregate principal amount of Notes for original issue on the Issue Date upon an Issuer Order, together with an Officer's Certificate; *provided* that an Opinion of Counsel shall not be required in connection with such issuance, authentication and delivery of the Notes on the Issue Date. The Trustee shall authenticate additional Notes ("Additional Notes") thereafter in unlimited amount for original issue upon an Issuer Order (an "Authentication Order") in aggregate principal amount as specified in such Authentication Order. The Trustee shall also authenticate (i) replacement Notes as provided in Section 2.08, (ii) temporary Notes as provided in Section 2.11, (iii) Notes issued in connection with certain transfers and exchanges as provided in Sections 2.07, 2.16 and 2.17, (iv) Notes issued in connection with a partial redemption of the Notes as provided in Section 3.06 or a partial repurchase of a Note as provided in Sections 4.07 and 4.08 and (v) Notes exchanged as provided in Section 8.05, in each case, upon an Authentication Order in aggregate principal amount as specified in such order. Each such written order shall specify the principal amount of Notes to be authenticated and the date on which the Notes are to be authenticated. Unless the context requires otherwise, references to "Notes" for all purposes of this Indenture include any Additional Notes that are actually issued.

Section 2.02 Form and Dating; Legends.

The Notes and the Trustee's certificate of authentication with respect thereto shall be substantially in the form set forth in Exhibit A, each of which is incorporated in and forms a part of this Indenture. Each Note shall be dated the date of its authentication.

The Notes may have notations, legends or endorsements required by law, rule or usage to which the Issuer is subject. Without limiting the generality of the foregoing, Notes offered and sold to Qualified Institutional Buyers in reliance on Rule 144 A ("Rule 144 A Notes"), Notes offered and sold to Non-U.S. Persons in offshore transactions in reliance on Regulation S ("Regulation S Notes") and all other Restricted Global Notes shall bear the Private Placement Legend. All Global Notes shall bear the Global Note Legend. Regulation S Notes shall bear the Regulation S Legend. Notes issued with original issue discount shall bear the Original Issue Discount Legend.

The terms and provisions contained in the Notes shall constitute, and are expressly made, a part of this Indenture and, to the extent applicable, the Issuer, the Guarantors and the Trustee, by their execution and delivery of this Indenture, expressly agree to such terms and provisions and agree to be bound thereby. If there is a conflict between the terms of the Notes and this Indenture, the terms of this Indenture shall govern.

The Notes may be presented for registration of transfer and exchange at the offices of the Registrar.

Section 2.03 Execution and Authentication.

The Notes shall be executed on behalf of the Issuer by one Officer of the Issuer. The signature of such Officer on the Notes may be manual, facsimile or electronic (including ".pdf").

If an Officer whose signature is on a Note was an Officer at the time of such execution but no longer holds that office at the time the Trustee authenticates the Note, the Note shall be valid nevertheless.

No Note shall be entitled to any benefit under this Indenture or be valid or obligatory for any purpose unless there appears on such Note a certificate of authentication substantially in the form provided for herein executed by the Trustee by manual, facsimile or electronic (including ".pdf") signature, and such certificate upon any Note shall be conclusive evidence, and the only evidence, that such Note has been duly authenticated and delivered hereunder. Notwithstanding the foregoing, if any Note shall have been authenticated and delivered hereunder but never issued and sold by the Issuer, and the Issuer shall deliver such Note to the Trustee for cancellation as provided in Section 2.12, for all purposes of this Indenture such Note shall be deemed never to have been authenticated and delivered hereunder and shall never be entitled to the benefits of this Indenture.

The Trustee may appoint one or more authenticating agents reasonably acceptable to the Issuer to authenticate the Notes. Unless otherwise provided in the appointment, an authenticating agent may authenticate the Notes whenever the Trustee may do so. Each reference in this Indenture to authentication by the Trustee includes authentication by such agent. An authenticating agent has the same rights as an Agent to deal with the Issuer and Affiliates of the Issuer. Each Paying Agent is designated as an authenticating agent for purposes of this Indenture.

Notes shall be issuable only in registered form without coupons in denominations of \$2,000 and any integral multiple of \$1,000 in excess thereof.

Section 2.04 Registrar and Paying Agent.

The Issuer shall maintain (a) an office or agency where Notes may be presented for registration of transfer or for exchange (the "Registrar"), (b) an office or agency in the Borough of Manhattan, The City of New York, the State of New York or in the city in the United States in which the Trustee's Corporate Trust Office is located, where Notes may be presented for payment (the "Paying Agent") and (c) an office or agency where notices and demands to or upon the Issuer, if any, in respect of the Notes and this Indenture may be served. The Registrar shall keep a register of the Notes and of their transfer and exchange. The Registrar shall provide a copy of such register from time to time upon request of the Issuer. The Issuer may appoint one or more co-registrars and one or more additional Paying Agent s. The term "Registrar" includes any co-registrars. The term "Paying Agent s" means the Paying Agent and any additional Paying Agent s. The Issuer may change any Paying Agent or Registrar without notice. The Issuer or any Restricted Subsidiaries may act as Registrar or a Paying Agent.

The Issuer shall enter into an appropriate agency agreement with any Agent that is not a party to this Indenture. The agreement shall implement the provisions of this Indenture that relate to such Agent. The Issuer shall notify the Trustee of the name and address of any such Agent. If the Issuer fails to maintain a Registrar or any required co-registrar or Paying Agent, or fails to give the foregoing notice, the Trustee shall act as such and shall be entitled to appropriate compensation in accordance with Section 7.07.

The Issuer initially appoints the Trustee as Registrar, Paying Agent and Depository Custodian.

The Issuer initially appoints The Depository Trust Company to act as Depository with respect to the Global Notes. The Issuer may change the Depository at any time without notice to any Holder, but the Issuer will notify the Trustee of the name and address of any new Depository.

The Issuer shall be responsible for making calculations called for under the Notes, including but not limited to determination of redemption price, premium, if any, and any additional amounts or other amounts payable on the Notes. The Issuer will make the calculations in good faith and, absent manifest error, its calculations will be final and binding on the Holder s. The Issuer will provide a schedule of its calculations to the Trustee when reasonably requested by the Trustee, and the Trustee is entitled to rely conclusively on the accuracy of the Issuer's calculations without independent verification. The Trustee shall forward the Issuer's calculations referred to above in this paragraph to any Holder upon the written request of such Holder.

Section 2.05 Paying Agent To Hold Money in Trust.

The Paying Agent shall hold in trust for the benefit of the Noteholder s or the Trustee all money held by the Paying Agent for the payment of principal of or premium or interest on the Notes (whether such money has been paid to it by the Issuer , one or more of the Guarantor s or any other obligor on the Notes), and the Issuer and the Paying Agent shall notify the Trustee of any default by the Issuer (or any other obligor on the Notes) in making any such payment. Money held in trust by a Paying Agent need not be segregated except as required by law and in no event shall a Paying Agent be liable for any interest on any money received by it hereunder. The Issuer at any time may require a Paying Agent to pay all money held by it to the Trustee and account for any funds disbursed and the Trustee may at any time during the continuance of any Event of Default specified in Section 6.01(1) or (2), upon written request to a Paying Agent , require such Paying Agent to pay forthwith all money so held by it to the Trustee and to account for any funds disbursed. Upon making such payment, such Paying Agent shall have no further liability for the money delivered to the Trustee .

Section 2.06 Noteholder Lists.

The Trustee shall preserve in as current a form as is reasonably practicable the most recent list available to it of the names and addresses of the Noteholder s. If the Trustee is not the Registrar , the Issuer shall furnish to the Trustee at least two Business Day s before each Interest Payment Date , and at such other times as the Trustee may request in writing, a list in such form and as of such date as the Trustee may reasonably require of the names and addresses of the Noteholder s.

Section 2.07 Transfer and Exchange .

Subject to Sections 2.16 and 2.17, when Notes are presented to the Registrar with a request from the Holder of such Notes to register a transfer or to exchange them for an equal principal amount of Notes of other authorized denominations, the Registrar shall register the transfer as requested. Every Note presented or surrendered for registration of transfer or exchange shall be duly endorsed or be accompanied by a written instrument of transfer in form satisfactory to the Issuer and the Registrar , duly executed by the Holder thereof or his attorneys duly authorized in writing. To permit registrations of transfers and exchanges, the Issuer shall issue and execute and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate new Notes (and the Guarantor s shall execute the Guarantee s thereon) evidencing such transfer or exchange at the Registrar 's request. No service charge shall be made to the Noteholder for any registration of transfer or exchange. The Issuer or the Trustee may require from the Noteholder payment of a sum sufficient to cover any transfer taxes or other governmental charge that may be imposed in relation to a transfer or exchange, but this provision shall not apply to any exchange pursuant to Section 2.11, 3.06, 4.07, 4.08 or 8.05 (in which events the Issuer shall be responsible for the payment of such taxes). The Registrar shall not be required to exchange or register a transfer of any Note for a period of 15 days immediately preceding the mailing of notice of redemption of Notes to be redeemed or of any Note selected, called or being called for redemption except the unredeemed portion of any Note being redeemed in part.

Any Holder of a Global Note shall, by acceptance of such Global Note, agree that transfers of the beneficial interests in such Global Note may be effected only through a book entry system maintained by the Holder of such Global Note (or its agent), and that ownership of a beneficial interest in the Global Note shall be required to be reflected in a book entry. By its acceptance of any Note bearing the Private Placement Legend, each Holder of such Note acknowledges the restrictions on transfer of such Note set forth in this Indenture and in the Private Placement Legend and agrees that it will transfer such Note only as provided in this Indenture.

Section 2.08 Replacement Notes.

If a mutilated Note is surrendered to the Registrar or the Trustee, or if the Holder of a Note claims that the Note has been lost, destroyed or wrongfully taken, the Issuer shall issue and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate a replacement Note (and the Guarantor s shall execute the Guarantee s thereon) if the Holder of such Note furnishes to the Issuer and the Trustee evidence reasonably acceptable to them of the ownership and the destruction, loss or theft of such Note and if the requirements of Section 8-405 of the New York Uniform Commercial Code as in effect on the date of this Indenture are met. If required by the Trustee or the Issuer, an indemnity bond shall be posted, sufficient in the judgment of all to protect the Issuer, the Guarantor s, the Trustee, the Registrar and any Paying Agent from any loss that any of them may suffer if such Note is replaced. The Issuer may charge such Holder for the Issuer's reasonable out-of-pocket expenses in replacing such Note and the Trustee may charge the Issuer for the Trustee's reasonable out-of-pocket expenses (including, without limitation, attorneys' fees and disbursements) in replacing such Note and may require the payment of a sum sufficient to cover any tax, assessment, fee or other charge that may be imposed in relation thereto and any other expenses (including the reasonable out-of-pocket fees and expenses of the Trustee) connected therewith. Every replacement Note shall constitute a contractual obligation of the Issuer. The provisions of this Section 2.08 are exclusive and will preclude (to the extent lawful) all other rights and remedies with respect to the replacement or payment of lost, destroyed, mutilated or wrongfully taken Notes.

Section 2.09 Outstanding Notes.

The Notes outstanding at any time are all Notes that have been authenticated by the Trustee except for (a) those canceled by or on behalf of the Trustee, (b) those accepted by the Trustee for cancellation, (c) those reductions in the interest in a Global Note effected by the Trustee in accordance with the provisions hereof, (d) to the extent set forth in Sections 9.01, 9.02 and 9.03, on or after the date on which the conditions set forth in Section 9.01, 9.02 or 9.03 have been satisfied, those Notes theretofore authenticated by the Trustee hereunder and (e) those described in this Section 2.09 as not outstanding. Subject to Section 2.10, a Note does not cease to be outstanding because the Issuer or one of its Affiliate s holds the Note.

If a Note is replaced pursuant to Section 2.08, it ceases to be outstanding unless the Trustee receives proof satisfactory to the Trustee and the Issuer that the replaced Note is held by a bona fide purchaser in whose hands such Note is a legal, valid and binding obligation of the Issuer .

If a Paying Agent holds, in its capacity as such, on any Maturity Date , Redemption Date or purchase date, U.S. Dollars sufficient to pay all accrued and unpaid interest and principal with respect to the Notes payable on that date and is not prohibited from paying such money to the Holder s thereof pursuant to the terms of this Indenture , then on and after that date such Notes shall cease to be outstanding and interest on them shall cease to accrue.

Section 2.10 Treasury Notes .

In determining whether the Holder s of the required principal amount of Notes have concurred in any declaration of acceleration or notice of default or direction, waiver or consent or any amendment, modification or other change to this Indenture , Notes owned by the Issuer or any other Affiliate of the Issuer shall be disregarded as though they were not outstanding, except that for the purposes of determining whether the Trustee shall be protected in relying on any such direction, waiver or consent or any amendment, modification or other change to this Indenture , only Notes as to which a Responsible Officer of the Trustee has actually received an Officer 's Certificate stating that such Notes are so owned shall be so disregarded. Notes so owned which have been pledged in good faith shall not be disregarded if the pledgee established to the satisfaction of the Trustee the pledgee's right so to act with respect to the Notes and that the pledgee is not the Issuer , a Guarantor , any other obligor on the Notes or any of their respective Affiliate s.

Section 2.11 Temporary Notes .

Until definitive Notes are prepared and ready for delivery, the Issuer may prepare and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate temporary Notes . Temporary Notes shall be substantially in the form of definitive Notes but may have variations that the Issuer considers appropriate for temporary Notes . Without unreasonable delay, the Issuer shall prepare and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate definitive Notes in exchange for temporary Notes . Until such exchange, temporary Notes shall be entitled to the same rights, benefits and privileges as definitive Notes .

Section 2.12 Cancellation.

The Issuer at any time may deliver Notes to the Trustee for cancellation. The Registrar and the Paying Agent shall forward to the Trustee any Notes surrendered to them for registration of transfer, exchange or payment. The Trustee shall cancel all Notes surrendered for registration of transfer, exchange, payment, replacement or cancellation and shall dispose of such canceled Notes in its customary manner. The Issuer may not reissue or resell or issue new Notes to replace Notes that the Issuer has redeemed or paid, or that have been delivered to the Trustee for cancellation.

Section 2.13 Default ed Interest.

If the Issuer defaults on a payment of interest on the Notes , the Issuer shall pay the defaulted interest then borne by the Notes plus (to the extent permitted by law) any interest payable on the defaulted interest, in accordance with the terms hereof, to the Person s who are Holder s thereof on a subsequent special record date, which date shall be at least five Business Day s prior to the payment date. If such default continues for thirty (30) days, the Issuer shall fix such special record date and payment date in a manner satisfactory to the Trustee . At least 10 days before such special record date, the Issuer (or upon the written request of the Issuer , the Trustee , in the name and at the expense of the Issuer) shall mail to each affected Noteholder a notice that states the special record date, the payment date and the amount of defaulted interest, and interest payable on defaulted interest, if any, to be paid. The Issuer may make payment of any defaulted interest in any other lawful manner not inconsistent with the requirements (if applicable) of any securities exchange on which the Notes may be listed and, upon such notice as may be required by such exchange, if, after written notice given by the Issuer to the Trustee of the proposed payment pursuant to this sentence, such manner of payment shall be deemed practicable by the Trustee . If the Issuer elects for the Trustee to send such notice to the Holder s then the Issuer shall provide such notice to the Trustee at least five (5) days (or such shorter time as may be agreed by the Trustee in its discretion) before such notice is required to be mailed to the Holder s.

Notwithstanding the foregoing, any interest which is paid prior to the expiration of the 30-day period set forth in Section 6.01(1) shall be paid to Holder s as of the record date for the Interest Payment Date for which interest has not been paid.

Section 2.14 CUSIP and ISIN Numbers.

The Issuer in issuing the Notes may use "CUSIP " and "ISIN " numbers, and if so used, such CUSIP and ISIN numbers shall be included in notices as a convenience to Holder s; *provided* that any such notice may state that no representation is made as to the correctness or accuracy of the CUSIP or ISIN numbers printed in the notice or on the Notes , that reliance may be placed only on the other identification numbers printed on the Notes , and any such notice shall not be affected by any defect in or omission of such CUSIP or ISIN numbers. The Issuer shall promptly notify the Trustee , in writing, of any such CUSIP or ISIN number used by the Issuer in connection with the issuance of the

Notes and of any change in any such CUSIP or ISIN number. In the case of any Additional Notes that are not fungible with the Notes for U.S. federal income tax purposes, such Additional Notes will have a separate CUSIP number and ISIN number from the Notes .

Section 2.15 Deposit of Moneys.

Prior to noon, New York City time, on each Interest Payment Date and Maturity Date , the Issuer shall have deposited with the Paying Agent in immediately available funds U.S. Dollars sufficient to make cash payments, if any, due on such Interest Payment Date or Maturity Date , as the case may be, in a timely manner which permits such Paying Agent s to remit payment to the Holder s on such Interest Payment Date or Maturity Date , as the case may be. The principal and interest on Global Notes shall be payable to the Depository or its nominee, as the case may be, as the sole registered owner and the sole Holder of the Global Notes represented thereby. The principal and interest on Physical Notes shall be payable, either in person, by wire transfer or by mail, at the office of the Paying Agent . Final payment of principal on the Maturity Date will only be made by the Trustee upon surrender of the related Note to the Trustee at its Corporate Trust Office .

Section 2.16 Book-Entry Provisions for Global Notes .

(a) Rule 144 A Notes initially shall be represented by one or more Notes in registered, global form without interest coupons (collectively, the "Rule 144 A Global Note "). Regulation S Notes initially shall be represented by one or more Notes in registered, global form without interest coupons (collectively, the "Regulation S Global Note "). The term "Global Notes " means the Rule 144 A Global Note and the Regulation S Global Note . The Global Notes shall bear the Global Note Legend . The Global Notes initially shall (i) be registered in the name of the Depository or the nominee of such Depository , in each case, for credit to an account of an Agent Member, (ii) be delivered to the Trustee as custodian for such Depository and (iii) bear the Private Placement Legend .

Members of, or direct or indirect participants in, the Depository ("Agent Members ") shall have no rights under this Indenture with respect to any Global Note held on their behalf by the Depository or under the Global Notes . The Depository may be treated by the Issuer , the Trustee and any agent of the Issuer or the Trustee as the absolute owner of the Global Notes for all purposes whatsoever. Notwithstanding the foregoing, nothing herein shall prevent the Issuer , the Trustee or any agent of the Issuer or the Trustee from giving effect to any written certification, proxy or other authorization furnished by the Depository or impair, as between the Depository and its Agent Members , the operation of customary practices governing the exercise of the rights of a Holder of any Note. None of the Issuer , the Trustee , the Paying Agent nor the Registrar shall have any responsibility or liability for any acts or omissions of the Depository with respect to such Global Note, for the records of the Depository , including records in respect of the beneficial owners of any such Global Note, for any transactions between the Depository and any Agent Member or between or among the Depository , any such Agent Member and/or any Holder or beneficial owner of such Global Note, or for any transfers of beneficial interests in any such Global Note.

(b) Transfers of Global Notes shall be limited to transfer in whole, but not in part, to the Depository, its successors or their respective nominees. Interests of beneficial owners in the Global Notes may be transferred or exchanged for Physical Notes only in accordance with the applicable rules and procedures of the Depository and the provisions of Section 2.17. In addition, a Global Note shall be exchangeable for Physical Notes (i) if requested by a holder of such interests upon receipt by the Trustee of written instructions from the Depository or its nominee on behalf of any beneficial owner and in accordance with the rules and procedures of the Depository and provisions of this Section 2.16 or (ii) if the Depository notifies the Issuer that it is unwilling or unable to continue as depository for such Global Note and the Issuer thereupon fail to appoint a successor depository within 120 days or (iii) if the Depository has ceased to be a clearing agency registered under the Exchange Act or (iv) if there shall have occurred and be continuing an Event of Default with respect to such Global Note and the Depository has requested such exchange. In all cases, Physical Notes delivered in exchange for any Global Note or beneficial interests therein shall be registered in the names, and issued in any approved denominations, requested by or on behalf of the Depository in accordance with its customary procedures.

(c) In connection with the transfer of a Global Note as an entirety to beneficial owners pursuant to subsection (b) of this Section 2.16, such Global Note shall be deemed to be surrendered to the Trustee for cancellation, and the Issuer shall execute and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate and deliver, to each beneficial owner identified by the Depository in writing in exchange for its beneficial interest in such Global Note, an equal aggregate principal amount of Physical Notes of authorized denominations.

(d) Any Restricted Physical Note delivered in exchange for an interest in a Global Note pursuant to Section 2.17 shall, except as otherwise provided in Section 2.17, bear the Private Placement Legend.

(e) The Holder of any Global Note may grant proxies and otherwise authorize any Person, including Agent Members and Persons that may hold interests through Agent Members, to take any action which a Holder is entitled to take under this Indenture or the Notes.

Section 2.17 Transfer and Exchange of Notes.

(a) Transfer and Exchange of Global Notes. A Global Note may not be transferred as a whole except as set forth in Section 2.16(b). Global Notes will not be exchanged by the Issuer for Physical Notes except under the circumstances described in Section 2.16(b). Global Notes also may be exchanged or replaced, in whole or in part, as provided in Sections 2.08 and 2.11. Beneficial interests in a Global Note may be transferred and exchanged as provided in Section 2.17(b) or 2.17(f).

(b) Transfer and Exchange of Beneficial Interests in Global Notes. The transfer and exchange of beneficial interests in the Global Notes shall be effected through the Depository, in accordance with the provisions of this Indenture and the applicable rules and procedures of the Depository. Beneficial interests in Restricted Global Notes shall be subject to restrictions on transfer comparable to those set forth herein to the extent required by the Securities Act. Beneficial interests in Global Notes shall be transferred or exchanged only for beneficial interests in Global Notes. Transfers and exchanges of beneficial interests in the Global Notes also shall require compliance with either subparagraph (i) or (ii) below, as applicable, as well as one or more of the other following subparagraphs, as applicable:

(i) Transfer of Beneficial Interests in the Same Global Note. Beneficial interests in any Restricted Global Note may be transferred to Persons who take delivery thereof in the form of a beneficial interest in the same Restricted Global Note in accordance with the transfer restrictions set forth in the Private Placement Legend; provided, however, that prior to the 40th day after the later of the commencement of the offering of the Notes represented by a Regulation S Global Note and the issue date of such Notes (such period through and including such 40th day, the "Restricted Period"), transfers of beneficial interests in a Regulation S Global Note may not be made to a U.S. Person or for the account or benefit of a U.S. Person (other than an Initial Purchaser). A beneficial interest in an Unrestricted Global Note may be transferred to Persons who take delivery thereof in the form of a beneficial interest in an Unrestricted Global Note. No written orders or instructions shall be required to be delivered to the Registrar to effect the transfers described in this Section 2.17(b)(i).

(ii) All Other Transfers and Exchanges of Beneficial Interests in Global Notes. In connection with all transfers and exchanges of beneficial interests in any Global Note that is not subject to Section 2.17(b)(i), the transferor of such beneficial interest must deliver to the Registrar (1) a written order from an Agent Member given to the Depository in accordance with the applicable rules and procedures of the Depository directing the Depository to credit or cause to be credited a beneficial interest in another Global Note in an amount equal to the beneficial interest to be transferred or exchanged and (2) instructions given in accordance with the applicable rules and procedures of the Depository containing information regarding the Agent Member account to be credited with such increase. Upon satisfaction of all of the requirements for transfer or exchange of beneficial interests in Global Notes contained in this Indenture and the Notes, the Trustee shall adjust the principal amount of the relevant Global Note(s) pursuant to Section 2.17(f).

(iii) Transfer of Beneficial Interests to Another Restricted Global Note . A beneficial interest in a Restricted Global Note may be transferred to a Person who takes delivery thereof in the form of a beneficial interest in another Restricted Global Note if the transfer complies with the requirements of Section 2.17(b)(ii) above and the Registrar receives the following:

(A) if the transferee will take delivery in the form of a beneficial interest in a Rule 144 A Global Note , then the transferor must deliver a certificate in the form of Exhibit F, including the certifications in item (1) thereof; and

(B) if the transferee will take delivery in the form of a beneficial interest in a Regulation S Global Note , then the transferor must deliver a certificate in the form of Exhibit F, including the certifications in item (2) thereof.

(iv) Transfer and Exchange of Beneficial Interests in a Restricted Global Note for Beneficial Interests in an Unrestricted Global Note . A beneficial interest in a Restricted Global Note may be exchanged by any holder thereof for a beneficial interest in an Unrestricted Global Note or transferred to a Person who takes delivery thereof in the form of a beneficial interest in an Unrestricted Global Note if the exchange or transfer complies with the requirements of Section 2.17(b)(ii) above and the Registrar receives the following:

(A) if the holder of such beneficial interest in a Restricted Global Note proposes to exchange such beneficial interest for a beneficial interest in an Unrestricted Global Note , a certificate from such holder in the form of Exhibit G, including the certifications in item (1)(a) thereof; or

(B) if the holder of such beneficial interest in a Restricted Global Note proposes to transfer such beneficial interest to a Person who shall take delivery thereof in the form of a beneficial interest in an Unrestricted Global Note , a certificate from such holder in the form of Exhibit F, including the certifications in item (4) thereof,

and, in each such case, an Opinion of Counsel in form reasonably acceptable to the Registrar to the effect that such exchange or transfer is in compliance with the Securities Act and that the restrictions on transfer contained herein and in the Private Placement Legend are no longer required in order to maintain compliance with the Securities Act . If any such transfer or exchange is effected pursuant to this subparagraph (iv) at a time when an Unrestricted Global Note has not yet been issued, the Issuer shall issue and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate one or more Unrestricted Global Note s in an aggregate principal amount equal to the aggregate principal amount of beneficial interests transferred or exchanged pursuant to this subparagraph (iv).

(v) Transfer and Exchange of Beneficial Interests in an Unrestricted Global Note for Beneficial Interests in a Restricted Global Note. Beneficial interests in an Unrestricted Global Note cannot be exchanged for, or transferred to Person s who take delivery thereof in the form of, a beneficial interest in a Restricted Global Note .

(c) Transfer and Exchange of Beneficial Interests in Global Notes for Physical Notes. A beneficial interest in a Global Note may not be exchanged for a Physical Note except under the circumstances described in Section 2.16(b). A beneficial interest in a Global Note may not be transferred to a Person who takes delivery thereof in the form of a Physical Note except under the circumstances described in Section 2.16(b).

(d) Transfer and Exchange of Physical Notes for Beneficial Interests in Global Notes. Transfer s and exchanges of beneficial interests in the Global Notes also shall require compliance with either subparagraph (i), (ii) or (ii) below, as applicable:

(i) Restricted Physical Note s to Beneficial Interests in Restricted Global Note s. If any Holder of a Restricted Physical Note proposes to exchange such Restricted Physical Note for a beneficial interest in a Restricted Global Note or to transfer such Restricted Physical Note to a Person who takes delivery thereof in the form of a beneficial interest in a Restricted Global Note , then, upon receipt by the Registrar of the following documentation:

(A) if the Holder of such Restricted Physical Note proposes to exchange such Restricted Physical Note for a beneficial interest in a Restricted Global Note , a certificate from such Holder in the form of Exhibit G, including the certifications in item (2)(a) thereof;

(B) if such Restricted Physical Note is being transferred to a Qualified Institutional Buyer in accordance with Rule 144 A under the Securities Act , a certificate to the effect set forth in Exhibit F, including the certifications in item (1) thereof;

(C) if such Restricted Physical Note is being transferred to a Non-U.S. Person in an offshore transaction in accordance with Rule 903 or Rule 904 under the Securities Act , a certificate to the effect set forth in Exhibit F, including the certifications in item (2) thereof;

(D) if such Restricted Physical Note is being transferred pursuant to an exemption from the registration requirements of the Securities Act in accordance with Rule 144 under the Securities Act , a certificate to the effect set forth in Exhibit F, including the certifications in item (3) (a) thereof;

(E) [Reserved]; or

(F) if such Restricted Physical Note is being transferred to the Issuer or a Subsidiary thereof, a certificate to the effect set forth in Exhibit F, including the certifications in item (3)(b) thereof;

the Trustee shall cancel the Restricted Physical Note , and increase or cause to be increased the aggregate principal amount of the appropriate Restricted Global Note .

(ii) Restricted Physical Note s to Beneficial Interests in Unrestricted Global Note s. A Holder of a Restricted Physical Note may exchange such Restricted Physical Note for a beneficial interest in an Unrestricted Global Note or transfer such Restricted Physical Note to a Person who takes delivery thereof in the form of a beneficial interest in an Unrestricted Global Note only if the Registrar receives the following:

(A) if the Holder of such Restricted Physical Note proposes to exchange such Restricted Physical Note for a beneficial interest in an Unrestricted Global Note , a certificate from such Holder in the form of Exhibit G, including the certifications in item (1)(b) thereof; or

(B) if the Holder of such Restricted Physical Note s proposes to transfer such Restricted Physical Note to a Person who shall take delivery thereof in the form of a beneficial interest in an Unrestricted Global Note , a certificate from such Holder in the form of Exhibit F, including the certifications in item (4) thereof,

and, in each such case, an Opinion of Counsel in form reasonably acceptable to the Registrar to the effect that such exchange or transfer is in compliance with the Securities Act and that the restrictions on transfer contained herein and in the Private Placement Legend are no longer required in order to maintain compliance with the Securities Act . Upon satisfaction of the conditions of this subparagraph (ii), the Trustee shall cancel the Restricted Physical Note s and increase or cause to be increased the aggregate principal amount of the Unrestricted Global Note . If any such transfer or exchange is effected pursuant to this subparagraph (ii) at a time when an Unrestricted Global Note has not yet been issued, the Issuer shall issue and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate one or more Unrestricted Global Note s in an aggregate principal amount equal to the aggregate principal amount of Restricted Physical Note s transferred or exchanged pursuant to this subparagraph (ii).

(iii) Unrestricted Physical Note s to Beneficial Interests in Unrestricted Global Note s. A Holder of an Unrestricted Physical Note may exchange such Unrestricted Physical Note for a beneficial interest in an Unrestricted Global Note or transfer such Unrestricted Physical Note to a Person who takes delivery thereof in the form of a beneficial interest in an Unrestricted Global Note at any time. Upon receipt of a request for such an exchange or transfer, the Trustee shall cancel the applicable Unrestricted Physical Note and increase or cause to be increased the aggregate principal amount of one of the Unrestricted Global Note s. If any such transfer or exchange is effected pursuant to this subparagraph (iii) at a time when an Unrestricted Global Note has not yet been issued, the Issuer shall issue and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate one or more Unrestricted Global Note s in an aggregate principal amount equal to the aggregate principal amount of Unrestricted Physical Note s transferred or exchanged pursuant to this subparagraph (iii).

(iv) Unrestricted Physical Note s to Beneficial Interests in Restricted Global Note s. An Unrestricted Physical Note cannot be exchanged for, or transferred to a Person who takes delivery thereof in the form of, a beneficial interest in a Restricted Global Note .

(e) Transfer and Exchange of Physical Notes for Physical Notes. Upon request by a Holder of Physical Notes and such Holder 's compliance with the provisions of this Section 2.17(e), the Registrar shall register the transfer or exchange of Physical Notes . Prior to such registration of transfer or exchange, the requesting Holder shall present or surrender to the Registrar the Physical Notes duly endorsed or accompanied by a written instruction of transfer in form satisfactory to the Registrar duly executed by such Holder or by its attorney, duly authorized in writing. In addition, the requesting Holder shall provide any additional certifications, documents and information, as applicable, required pursuant to the following provisions of this Section 2.17(e).

(i) Restricted Physical Note s to Restricted Physical Note s. A Restricted Physical Note may be transferred to and registered in the name of a Person who takes delivery thereof in the form of a Restricted Physical Note if the Registrar receives the following:

(A) if the transfer will be made pursuant to Rule 144 A under the Securities Act , then the transferor must deliver a certificate in the form of Exhibit F, including the certifications in item (1) thereof;

(B) if the transfer will be made pursuant to Rule 903 or Rule 904 under the Securities Act , then the transferor must deliver a certificate in the form of Exhibit F, including the certifications in item (2) thereof;

(C) if the transfer will be made pursuant to an exemption from the registration requirements of the Securities Act in accordance with Rule 144 under the Securities Act, a certificate to the effect set forth in Exhibit F, including the certifications in item (3)(a) thereof;

(D) [Reserved]; and

(E) if such transfer will be made to the Issuer or a Subsidiary thereof, a certificate to the effect set forth in Exhibit F, including the certifications in item (3)(b) thereof.

(ii) Restricted Physical Note s to Unrestricted Physical Note s. Any Restricted Physical Note may be exchanged by the Holder thereof for an Unrestricted Physical Note or transferred to a Person who takes delivery thereof in the form of an Unrestricted Physical Note if the Registrar receives the following:

(1) if the Holder of such Restricted Physical Note proposes to exchange such Restricted Physical Note for an Unrestricted Physical Note, a certificate from such Holder in the form of Exhibit G, including the certifications in item (1)(c) thereof; or

(2) if the Holder of such Restricted Physical Note proposes to transfer such Notes to a Person who shall take delivery thereof in the form of an Unrestricted Physical Note, a certificate from such Holder in the form of Exhibit F, including the certifications in item (4) thereof,

and, in each such case, an Opinion of Counsel in form reasonably acceptable to the Issuer to the effect that such exchange or transfer is in compliance with the Securities Act and that the restrictions on transfer contained herein and in the Private Placement Legend are no longer required in order to maintain compliance with the Securities Act.

(iii) Unrestricted Physical Note s to Unrestricted Physical Note s. A Holder of an Unrestricted Physical Note may transfer such Unrestricted Physical Note s to a Person who takes delivery thereof in the form of an Unrestricted Physical Note at any time. Upon receipt of a request to register such a transfer, the Registrar shall register the Unrestricted Physical Note s pursuant to the instructions from the Holder thereof.

(iv) Unrestricted Physical Note s to Restricted Physical Note s. An Unrestricted Physical Note cannot be exchanged for, or transferred to a Person who takes delivery thereof in the form of, a Restricted Physical Note.

(f) Cancellation and/or Adjustment of Global Notes. At such time as all beneficial interests in a particular Global Note have been exchanged for Physical Notes or a particular Global

Note has been redeemed, repurchased or canceled in whole and not in part, each such Global Note shall be returned to or retained and canceled by the Trustee in accordance with Section 2.12. At any time prior to such cancellation, if any beneficial interest in a Global Note is exchanged for or transferred to a Person who will take delivery thereof in the form of a beneficial interest in another Global Note or for Physical Notes, the principal amount of Notes represented by such Global Note shall be reduced accordingly and an endorsement shall be made on such Global Note by the Trustee or by the Depository at the direction of the Trustee to reflect such reduction; and if the beneficial interest is being exchanged for or transferred to a Person who will take delivery thereof in the form of a beneficial interest in another Global Note, such other Global Note shall be increased accordingly and an endorsement shall be made on such Global Note by the Trustee or by the Depository at the direction of the Trustee to reflect such increase.

(g) Private Placement Legend. Upon the registration of transfer, exchange or replacement of Notes not bearing the Private Placement Legend, the Registrar shall deliver Notes that do not bear the Private Placement Legend. Upon the registration of transfer, exchange or replacement of Notes bearing the Private Placement Legend, the Registrar shall deliver only Notes that bear the Private Placement Legend unless (i) there is delivered to the Registrar an Opinion of Counsel reasonably satisfactory to the Issuer and the Trustee to the effect that neither such legend nor the related restrictions on transfer are required in order to maintain compliance with the provisions of the Securities Act or (ii) such Note has been sold pursuant to an effective registration statement under the Securities Act and the Registrar has received an Officer's Certificate from the Issuer to such effect.

(h) General. All Global Notes and Physical Notes issued upon any registration of transfer or exchange of Global Notes or Physical Notes shall be the valid obligations of the Issuer, evidencing the same debt, and entitled to the same benefits under this Indenture, as the Global Notes or Physical Notes surrendered upon such registration of transfer or exchange.

The Registrar shall retain for a period of two years copies of all letters, notices and other written communications received pursuant to Section 2.16 or this Section 2.17. The Issuer shall have the right to inspect and make copies of all such letters, notices or other written communications at any reasonable time upon the giving of reasonable notice to the Registrar.

None of the Issuer, the Trustee, Paying Agent nor any Agent of the Issuer shall have any responsibility or liability in any respect of the records relating to or payment made on account of beneficial interests in a Global Note, or for maintaining, supervising or reviewing any records relating to such beneficial ownership interests.

Neither the Trustee nor the Registrar shall have any obligation or duty to monitor, determine or inquire as to compliance with any restrictions on transfer imposed under this Indenture or under applicable law with respect to any transfer of any interest in any Note (including any transfers between or among Agent Members or beneficial owners of interests in any Global Note) other than to require delivery of such certificates and other documentation or evidence as are expressly required by, and to do so if and when expressly required by the terms of, this Indenture, and to examine the same to determine substantial compliance as to form with the express requirements hereof.

Section 2.18 Computation of Interest.

Interest on the Notes shall be computed on the basis of a 360-day year, comprising twelve 30-day months and, in the case of an incomplete month, the number of actual days elapsed.

Section 2.19 Additional Amounts .

All payments made by or on behalf of any of the Guarantor s under or with respect to the Notes and the Note Guarantee s will be made free and clear of and without withholding or deduction for, or on account of, any present or future taxes, duties, assessments or governmental charges of whatever nature imposed or levied (including any penalties and interest related thereto) ("Taxes ") unless the withholding or deduction of such Taxes is then required by law or by the official interpretation or administration thereof. If, with respect to a Guarantor , any withholding or deduction for, or on account of, any Taxes imposed or levied by or on behalf of (i) any jurisdiction (other than the United States) in which such Guarantor is then incorporated, organized, engaged in business or resident for tax purposes, or any political subdivision or governmental authority thereof or therein having power to tax or (ii) any jurisdiction (other than the United States) from or through which payment is made by or on behalf of such Guarantor (each, a "Tax Jurisdiction "), will at any time be required to be made from any payments made by or on behalf of such Guarantor with respect to the Notes or its Note Guarantee , including, without limitation, payments of principal, redemption price, purchase price, interest or premium, such Guarantor will pay such additional amounts (the "Additional Amounts ") as may be necessary in order that the net amounts received in respect of such payments by each Holder (including payments of Additional Amounts) after such withholding or deduction will equal the respective amounts that would have been received in respect of such payments in the absence of such withholding or deduction; *provided, however*, that no Additional Amounts will be payable with respect to:

(1) any Taxes that would not have been imposed but for the Holder or beneficial owner of the Notes being a citizen, resident or national of, incorporated in or carrying on a business in the relevant Tax Jurisdiction in which such Taxes are imposed, or having any other present or former connection with the relevant Tax Jurisdiction in which such Taxes are imposed other than by the mere acquisition or holding of any Note or the enforcement or receipt of payment under or in respect of any Note or any Note Guarantee ;

(2) any Taxes imposed or withheld as a result of the failure of the Holder or beneficial owner of the Notes to comply with any written request, made to the Holder or beneficial owner in writing at least 90 days before any such withholding or deduction would be made, by the Issuer or any of the Guarantors to provide timely or accurate information concerning the nationality, residence or identity of such Holder or beneficial owner or to make any valid or timely declaration or similar claim or satisfy any certification information or other reporting requirements (to the extent such Holder or beneficial owner is legally eligible to do so), which is required or imposed by a statute, treaty, regulation or administrative practice of the relevant Tax Jurisdiction as a precondition to exemption from all or part of such Taxes ;

(3) any Taxes that are imposed or withheld as a result of the presentation of any Note for payment (where Notes are in the form of definitive notes and presentation is required) more than 30 days after the relevant payment is first made available for payment to the Holder (except to the extent that the Holder would have been entitled to Additional Amounts had the Note been presented on the last day of such 30 day period);

(4) any estate, inheritance, gift, sales, use, transfer, personal property or similar Taxes ;

(5) any Taxes which are payable otherwise than by deduction or withholding from payments made under or with respect to any Guarantee ;

(6) any Taxes that were imposed with respect to any payment under or with respect to the Notes and the Note Guarantees to any Holder of a Note who is a fiduciary or partnership or Person other than the sole beneficial owner of such payment to the extent that a beneficiary or settlor with respect to such fiduciary or a partner of such partnership or a beneficial owner would be required to include such payment in its income under the laws of the relevant Tax Jurisdiction and would not have been entitled to receive payment of the Additional Amounts had the beneficiary, settlor, partner or beneficial owner been the Holder of such Note;

(7) any Taxes that are imposed or withheld pursuant to Sections 1471 through 1474 of the Code , as of the Issue Date (or any amended or successor version of such sections that is substantively comparable and not materially more onerous to comply with), any regulations promulgated thereunder, any official interpretations thereof, any intergovernmental agreement between a non-U.S. jurisdiction and the United States with respect to the foregoing or any law or regulation adopted pursuant to any such intergovernmental agreement, or any agreements entered into pursuant to Section 1471(b)(1) of the Code ; or

(8) any combination of items (1) through (7) above.

In addition to the foregoing, the Dutch Guarantor will pay and indemnify the Holder s for any present or future stamp, issue, registration, transfer, court or documentary taxes, or any other excise, property or similar taxes levied by The Netherlands on or in connection with the execution, delivery, registration or enforcement of the Note Guarantee provided by the Dutch Guarantor or with respect to any payment to a Holder of Notes thereunder (limited, solely in the case of taxes attributable to the receipt of any payments with respect thereto, to any such taxes that are not excluded under clauses (1) through (4) and (6) through (7) or any combination thereof).

If the Issuer or any Guarantor becomes aware that any Guarantor will be obligated to pay Additional Amounts with respect to any payment under or with respect to any Note Guarantee , the Issuer or the relevant Guarantor , as the case may be, will deliver to the Trustee on a date at least 30 days prior to the date of payment (unless the obligation to pay Additional Amounts arises after the 30th day prior to that payment date, in which case the Issuer or the relevant Guarantor shall notify the Trustee promptly thereafter) an Officer 's Certificate stating the fact that Additional Amounts will be payable and the amount estimated to be so payable. The Officer 's Certificate must also set forth any other information reasonably necessary to enable the Paying Agent to pay Additional Amounts on the relevant payment date. The Trustee shall be entitled to rely solely on such Officer 's Certificate as conclusive proof that such payments are necessary. The Issuer or the relevant Guarantor will provide the Trustee with documentation reasonably satisfactory to the Trustee evidencing the payment of Additional Amounts .

The relevant Guarantor will make all deductions and withholding of Taxes required by law and will remit the full amount deducted or withheld to the relevant Tax authority in accordance with applicable law. The relevant Guarantor will use its reasonable efforts to obtain Tax receipts from each relevant Tax authority evidencing the payment of any Taxes so deducted or withheld. Upon written request, the relevant Guarantor will furnish to the Holder s, within 60 days after the date the payment of any Taxes so deducted or withheld is made, certified copies of Tax receipts evidencing payment by the Guarantor , or if, notwithstanding such Guarantor 's efforts to obtain receipts, receipts are not obtained, other evidence of payments by such Guarantor .

Whenever this Indenture mentions the payment of amounts based on the principal amount, interest or any other amount payable under, or with respect to, any Note Guarantee , such mention shall be deemed to include the payment of Additional Amounts to the extent that, in such context, Additional Amounts are, were or would be payable in respect thereof.

The above obligations will survive any termination, defeasance or discharge of this Indenture , any transfer by a Holder or beneficial owner of its Notes , and will apply, *mutatis mutandis*, to any jurisdiction in which any successor Person to any Guarantor is then incorporated, organized, engaged in business or resident for tax purposes, or any political subdivision or governmental authority thereof or therein having power to tax or any jurisdiction from or through which payment is made by or on behalf of any Guarantor .

ARTICLE III.
REDEMPTIONSection 3.01 Election To Redeem; Notices to Trustee.

If the Issuer elects to redeem Notes pursuant to paragraph 5 of the Notes, at least 2 Business Days (or such shorter time period as the Trustee may agree) before notice of redemption is required to be sent or caused to be sent to Holders pursuant to Section 3.03 but not more than 65 days before the Redemption Date (except as set forth in the last paragraph of Section 3.03), the Issuer shall furnish to the Trustee an Officer's Certificate setting forth (a) the paragraph or subparagraph of such Note pursuant to which the redemption shall occur, (b) the principal amount of Notes to be redeemed, (c) the Redemption Date and (d) the redemption price(s) (or manner of calculation if not then known); *provided* that no Opinion of Counsel pursuant to Section 12.04 or otherwise shall be required in connection with the delivery of such notice of redemption or redemption.

Section 3.02 Selection by Trustee of Notes To Be Redeemed or Purchased.

If less than all of the Notes are to be redeemed or purchased at any time, selection of such Notes for redemption or purchase will be made by the Trustee in compliance with the requirements of the principal national securities exchange, if any, on which the Notes to be redeemed or purchased are listed or, if the Notes are not so listed, on a *pro rata* basis (or, in the case of Global Notes, the Notes will be selected for redemption or purchase based on the Depository's applicable procedures). Such Notes to be redeemed or purchased shall be selected, unless otherwise provided herein, not less than 10 nor more than 60 days prior to the Redemption Date or the purchase date from the outstanding Notes not previously called for redemption or purchase.

The Trustee shall promptly notify the Issuer in writing of the Notes selected for redemption or purchase and, in the case of any Note selected for partial redemption or purchase, the principal amount thereof to be redeemed or purchased. Notes and portions of Notes selected shall be in amounts of \$1,000 or whole multiples of \$1,000 in excess thereof; *provided* that no Notes with a principal amount of \$2,000 or less shall be redeemed or purchased in part, except that if all of the Notes of a Holder are to be redeemed or purchased, the entire outstanding amount of Notes of such series held by such Holder, even if not a multiple of \$1,000, shall be redeemed or purchased. For all purposes of this Indenture unless the context otherwise requires and except as provided in the preceding sentence, provisions of this Indenture that apply to Notes called for redemption or purchase also apply to portions of Notes called for redemption or purchase.

If any Note is to be redeemed or purchased in part only, the notice of redemption or offer to purchase that relates to such Note shall state the portion of the principal amount thereof to be redeemed or purchased. With respect to Physical Notes, a new Physical Note in principal amount equal to the unredeemed or unpurchased portion of the original Physical Note will be issued in the name of the Holder thereof upon cancellation of the original Note; *provided* that any new Notes will be only issued in denominations of \$2,000 and any integral multiple of \$1,000 in excess thereof. On and after the Redemption Date or purchase date, interest will cease to accrue on such Notes or portions thereof called for redemption or purchase. Redemption or purchase price shall only be paid upon presentation and surrender of any such Notes to be redeemed or purchased.

Section 3.03 Notice of Redemption.

At least 10 days but, except as set forth in the last paragraph of this Section 3.03, no more than 60 days, before a Redemption Date or purchase date, the Issuer shall send, or cause to be sent, a notice of redemption electronically or by first-class mail to each Holder to be redeemed at his or her last address as the same appears on the registry books maintained by the Registrar pursuant to Section 2.06 or otherwise in accordance with the procedures of the Depository, except that redemption notices may be delivered or mailed more than 60 days prior to a Redemption Date if the notice is issued in connection with Article IX. Notices of redemption may be conditional.

The notice shall identify the Notes to be redeemed (including the CUSIP and/or ISIN numbers thereof) and shall state:

1. the Redemption Date ;
 2. the redemption price and the amount of premium (or manner of calculation if not then known), if any, and accrued and unpaid interest to be paid;
 3. if any Note is being redeemed or purchased in part, the portion of the principal amount of such Note to be redeemed or purchased and that, with respect to Physical Notes, after the Redemption Date and upon surrender of such Note, a new Note or Notes in principal amount equal to the unredeemed or unpurchased portion of the original Note representing the same indebtedness to the extent not redeemed or repurchased will be issued in the name of the Holder of such Notes upon cancellation of the original Note; provided that the new Notes will be only issued in denominations of \$2,000 and any integral multiple of \$1,000 in excess thereof;
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4. the name and address of the Paying Agent ;
5. that Notes called for redemption must be surrendered to the Paying Agent to collect the redemption price;
6. that unless the Issuer defaults in making the redemption payment, interest on Notes called for redemption ceases to accrue on and after the Redemption Date ;
7. that paragraph or subparagraph of the Notes pursuant to which the Notes called for redemption are being redeemed;
8. the aggregate principal amount of Notes that are being redeemed;
9. any condition to such redemption; and
10. that no representation is made as to the correctness or accuracy of the CUSIP or ISIN numbers printed in the notice or on the Notes .

A notice of redemption need not set forth the exact redemption price but only the manner of calculation thereof.

At the Issuer 's written request made at least 2 Business Day s prior to the date on which notice is to be given (unless a shorter notice shall be agreed to by the Trustee), together with the notice of redemption to be given, the Trustee shall give the notice of redemption in the Issuer 's name and at the Issuer 's sole expense.

Notice of any redemption of, or any offer to purchase, the Notes may, at the Issuer 's discretion, be given subject to one or more conditions precedent. In addition, if such redemption or purchase is subject to satisfaction of one or more conditions precedent, such notice shall describe each such condition, and if applicable, shall state that, in the Issuer 's discretion, the Redemption Date or the purchase date may be delayed until such time (including more than 60 days after the date the notice of redemption or offer to purchase was mailed or delivered, including by electronic transmission) as any or all such conditions shall be satisfied, or such redemption or purchase may not occur and such notice may be rescinded in the event that any or all such conditions shall not have been satisfied by the Redemption Date or the purchase date or by the Redemption Date or the purchase date as so delayed, or such notice or offer may be rescinded at any time in the Issuer 's discretion if the Issuer reasonably believes that any or all of such conditions will not be satisfied. In addition, the Issuer may provide in such notice that payment of the redemption or purchase price and performance of the Issuer 's obligations with respect to such redemption or offer to purchase may be performed by another Person .

Section 3.04 Effect of Notice of Redemption or Purchase.

Once a notice of redemption described in Section 3.03 is sent (including electronically) and subject to the proviso to this sentence, Notes called for redemption or purchase become due and payable on the Redemption Date or purchase date, as applicable, and at the redemption price or purchase price, as applicable, including any premium, plus interest accrued and unpaid to, but excluding, the Redemption Date or purchase date; *provided, however*, that any redemption or purchase and notice or offer thereof pursuant to this Indenture may, in the Issuer's discretion, be subject to the satisfaction of one or more conditions precedent described in such notice and in which case if and/or to the extent such condition(s) precedent is/are not satisfied the Issuer shall have no obligation to redeem or purchase Notes on such Redemption Date or purchase date. The notice, if sent in a manner herein provided (including electronically), shall be conclusively presumed to have been given, whether or not the Holder receives such notice. In any case, failure to give such notice or any defect in the notice to the Holder of any Note designated for redemption or purchase in whole or in part shall not affect the validity of the proceedings for the redemption or purchase of any other Note or portions thereof. Upon surrender to the Paying Agent, such Notes shall be paid at the redemption price or the purchase price, as the case may be, including any premium, plus interest accrued and unpaid to, but excluding, the Redemption Date or purchase date and such Notes shall be cancelled by the Trustee; *provided* that if the Redemption Date or purchase date is after a regular record date and on or prior to the relevant Interest Payment Date, the accrued and unpaid interest shall be payable to the Holder registered on the relevant record date; and *provided, further*, that if a Redemption Date or purchase date is a Legal Holiday, payment shall be made on the next succeeding Business Day and no interest shall accrue for the period from such Redemption Date or purchase date to such succeeding Business Day. Subject to Section 3.05, on and after the Redemption Date or purchase date, as the case may be, interest shall cease to accrue on Notes or portions thereof called for redemption or purchase.

Section 3.05 Deposit of Redemption or Purchase Price.

On or prior to 1:00 p.m., New York City time (or such later time as the Trustee may agree), on each Redemption Date or purchase date, the Issuer shall deposit with the Paying Agent U.S. Dollars sufficient to pay the redemption price or purchase price of, including premium, if any, and accrued and unpaid interest, if any, on any and all Notes to be redeemed or purchased on that date (other than Notes or portions thereof called for redemption or purchase on that date which have been delivered by the Issuer to the Trustee for cancellation). The Trustee or the Paying Agent shall promptly return to the Issuer any money deposited with the Trustee or the Paying Agent by the Issuer in excess of the amounts necessary to pay the redemption price or purchase price of, including premium, if any, and accrued and unpaid interest, if any, on any and all Notes to be redeemed or purchased.

On and after any Redemption Date or purchase date, as the case may be, if money sufficient to pay the redemption price or purchase price of, including premium, if any, and accrued and unpaid interest, if any, on all Notes called for redemption or purchase shall have been made available in accordance with the immediately preceding paragraph, the Notes called for redemption or purchase will cease to accrue interest and the only right of the Holder s of such Notes will be to receive payment of the redemption price or purchase price of and, subject to the right of Holder s of record on the relevant record date to receive interest due on the relevant Interest Payment Date falling on or after the Redemption Date or purchase date, as the case may be, accrued and unpaid interest on such Notes to the Redemption Date or purchase date. If any Note surrendered for redemption or purchase shall not be so paid, interest will be paid, from the Redemption Date or purchase date, as the case may be, until such redemption or purchase payment is made, on the unpaid principal of the Note and (to the extent permitted by applicable law) any interest not paid on such unpaid principal, in each case, at the rate and in the manner provided in the Notes .

Section 3.06 Notes Redeemed or Purchased in Part.

Upon surrender of a Note that is redeemed or purchased in part, the Issuer shall execute and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate for the Holder thereof a new Note equal in principal amount to the unredeemed or unpurchased portion of the Note surrendered representing the same indebtedness to the extent not redeemed or purchased; *provided* that each new Note will be issued in a principal amount of \$2,000 or an integral multiple of \$1,000 in excess thereof. It is understood that, notwithstanding anything in this Indenture to the contrary, only an Officer's Certificate and not an Opinion of Counsel is required for the Trustee to authenticate such new Note.

Section 3.07 Mandatory Redemption; Open Market Purchases.

Subject to Sections 4.07 and 4.08, the Issuer shall not be required to make any mandatory redemption or sinking fund payments with respect to the Notes . The Issuer and its Affiliate s may acquire Notes at any time and from time to time by means other than a redemption, whether by tender offer, open market purchases, negotiated transactions or otherwise, in accordance with applicable securities laws, so long as such acquisition does not otherwise violate the terms of this Indenture .

ARTICLE IV
COVENANTSSection 4.01 Payment of Notes.

The Issuer shall pay the principal of and interest on the Notes on the dates and in the manner provided in the Notes and this Indenture ; *provided* that all payments of principal and interest with respect to the Notes represented by one or more Global Notes registered in the name of or held by the Depository or its nominee will be made in accordance with the Depository 's applicable procedures. An installment of principal or interest shall be considered paid on the date it is due if the Trustee or the Paying Agent s hold by noon, New York City time, on that date U.S. Dollars designated for and sufficient to pay such installment. If an Interest Payment Date is a Legal Holiday at a place of payment, payment may be made at that place on the next succeeding Business Day and no interest on such payment will accrue in respect of the delay.

The Issuer shall pay interest on overdue principal (including post-petition interest in a proceeding under any Bankruptcy Law), and overdue interest, to the extent lawful, at the rate specified in the Notes .

Section 4.02 Maintenance of Office or Agency.

(a) The Issuer shall maintain in the Borough of Manhattan, The City of New York, an office or agency (which may be an office of the Trustee or an Affiliate of the Trustee or Registrar) where Notes may be surrendered for registration of transfer or for exchange and where notices and demands to or upon the Issuer in respect of the Notes and this Indenture may be served. The designated office of the Trustee shall be such office or agency of the Issuer in the City of New York, unless the Issuer shall designate and maintain some other office or agency for one or more purposes. The Issuer shall give prompt written notice to the Trustee of any change in the location of such office or agency. If at any time the Issuer shall fail to maintain any such required office or agency or shall fail to furnish the Trustee with the address thereof, such presentations, surrenders, notices and demands may be made or served at the Corporate Trust Office of the Trustee , and the Issuer hereby appoints the Trustee as its agent to receive all such presentations, surrenders, notices and demands.

(b) The Issuer may also from time to time designate one or more other offices or agencies where the Notes may be presented or surrendered for any or all such purposes and may from time to time rescind such designations; *provided, however*, that no such designation or rescission shall in any manner relieve the Issuer of its obligation to maintain an office or agency in the Borough of Manhattan, The City of New York. The Issuer shall give prompt written notice to the Trustee of any such designation or rescission and of any change in the location of any such other office or agency.

(c) The Issuer hereby designates the Corporate Trust Office of the Trustee , or its Agent , in the Borough of Manhattan, The City of New York, as such office or agency of the Issuer in accordance with Section 2.04.

Section 4.03 Legal Existence.

Except as permitted by Article V, the Issuer shall do or cause to be done all things necessary to preserve and keep in full force and effect (i) its legal existence, and the corporate, partnership or other existence of each Wholly Owned Subsidiary that is a Domestic Subsidiary and the Dutch Guarantor , in accordance with the respective organizational documents (as the same may be amended from time to time) of the Issuer and each such Subsidiary and (ii) the material rights (charter and statutory) and franchises of the Issuer and such Subsidiaries ; *provided* that the Issuer shall not be required to preserve any such right, franchise, or the corporate, partnership or other existence of any of its Subsidiaries if the Board of Directors of the Issuer or such Subsidiary shall determine that the preservation thereof is no longer desirable in the conduct of the business of the Issuer and its Subsidiaries , taken as a whole. For the avoidance of doubt, the Issuer and its Subsidiaries shall be permitted to change their organizational form.

Section 4.04 Waiver of Stay, Extension or Usury Laws.

The Issuer and each of the Guarantor s covenant (to the extent that it may lawfully do so) that they shall not at any time insist upon, or plead (as a defense or otherwise) or in any manner whatsoever claim or take the benefit or advantage of, any stay or extension law or any usury law which would prohibit or forgive the Issuer and the Guarantor s from paying all or any portion of the principal of, premium, if any, and/or interest on the Notes as contemplated herein, wherever enacted, now or at any time hereafter in force, or which may affect the covenants or the performance of this Indenture ; and (to the extent that they may lawfully do so) the Issuer and the Guarantor s hereby expressly waive all benefit or advantage of any such law, and covenants that they will not hinder, delay or impede the execution of any power herein granted to the Trustee , but will suffer and permit the execution of every such power as though no such law had been enacted.

Section 4.05 Compliance Certificate.

(a) The Issuer shall deliver to the Trustee , within 120 days after the end of each Fiscal Year , an Officer 's Certificate stating that such Officer has conducted or supervised a review of the activities of the Issuer and its Subsidiaries and the Issuer 's and its Subsidiaries ' performance under this Indenture during such Fiscal Year , and further stating, as to such Officer signing such certificate, that, to the best of such Officer 's knowledge, based upon such review, the Issuer has fulfilled all obligations under this Indenture or, if there has been a Default under this Indenture that is continuing, a description of such Default of which such Officer has knowledge and what action the Issuer and its Subsidiaries are taking or propose to take with respect thereto.

(b) The Issuer shall deliver to the Trustee , within 30 Business Day s after an executive officer of the Issuer becomes aware of any Default or Event of Default , a statement specifying such Default or Event of Default .

Section 4.06 Taxes.

The Issuer shall, and shall cause each of its Subsidiaries to, pay prior to delinquency all material Taxes which, if unpaid, might by law become a lien upon the property of the Issuer or any of its Subsidiaries ; *provided, however*, that, neither the Issuer nor any of its Subsidiaries shall be required to pay or discharge or cause to be paid or discharged any such Taxes whose amount, applicability or validity is being contested in good faith by appropriate proceedings and adequate reserves with respect thereto are maintained in accordance with GAAP or where failure to effect such payment is not adverse in any material respect to the Holder s.

Section 4.07 Repurchase at the Option of Holder s upon Change of Control .

(a) Upon the occurrence of a Change of Control , each Holder shall have the right to require the Issuer to repurchase all or any part (equal to \$2,000 or an integral multiple of \$1,000 in excess thereof) of such Holder 's Notes pursuant to the offer described below (the "Change of Control Offer") at an offer price in cash (the "Change of Control Payment") equal to 101% of the aggregate principal amount thereof, plus accrued and unpaid interest, if any, thereon to but excluding the purchase date, subject to the right of Holder s of record on the relevant record date to receive interest due on the relevant Interest Payment Date falling on or prior to the Change of Control Payment Date .

(b) Within 30 days following any Change of Control or, at the Issuer 's option, prior to the consummation of such Change of Control , the Issuer will mail (or to the extent permitted or required by applicable Depository procedures or regulations with respect to global Notes , send electronically) a notice to each Holder and the Trustee . The notice shall describe the transaction or transactions that constitute the Change of Control and offer to repurchase Notes on the purchase date specified in such notice (which must be no earlier than 20 Business Day s nor later than 60 days from the date such notice is sent (unless delivered in advance of the occurrence of such Change of Control), other than as required by law) (the "Change of Control Payment Date") pursuant to the procedures required by this Indenture and described in such notice. Such notice shall state:

(1) that the Change of Control Offer is being made pursuant to this Section 4.07 and that all Notes validly tendered and not validly withdrawn pursuant to such Change of Control Offer will be accepted for payment;

- (2) the Change of Control Payment and the Change of Control Payment Date (which shall be no earlier than 20 Business Days nor later than 60 days from the date such notice is sent (unless delivered in advance of the occurrence of such Change of Control), other than as may be required by law); *provided* that the Change of Control Payment Date may be delayed, in the Issuer's discretion, until such time (including more than 60 days after the date such notice is sent) as any or all such conditions referred to in clause (8) below shall be satisfied;
- (3) that any Note not properly tendered will remain outstanding and continue to accrue interest;
- (4) that, unless the Issuer defaults in the payment of the Change of Control Payment, any Note accepted for payment pursuant to the Change of Control Offer shall cease to accrue interest on the Change of Control Payment Date;
- (5) that Holders electing to have a Note purchased pursuant to the Change of Control Offer will be required to surrender the Note, with the form entitled "Option of Holder to Elect Purchase" on the reverse of the Note completed, to the Paying Agent and Registrar for the Note at the address specified in the notice prior to the close of business on the third (3rd) Business Day prior to the Change of Control Payment Date;
- (6) that Holders will be entitled to withdraw their tendered Notes and their election to require the Issuer to purchase such Notes if the Paying Agent receives, not later than the expiration time of the Change of Control Offer, a telegram, telex, facsimile transmission or letter setting forth the name of the Holder, the principal amount of the Notes the Holder tendered for purchase and a statement that such Holder is withdrawing its tendered Notes and its election to have such Note purchased;
- (7) that if the Issuer is redeeming less than all of the Notes, Holders whose Notes are purchased only in part will be issued new Notes in a principal amount equal to the unpurchased portion of the Notes surrendered; *provided, however*, each new Note issued shall be in a principal amount of \$2,000 or an integral multiple of \$1,000 in excess thereof;
- (8) if such notice is sent prior to the occurrence of a Change of Control, stating that the Change of Control Offer is conditional on the occurrence of such Change of Control or such other conditions specified therein and shall describe each such condition, and, if applicable, shall state that, in the Issuer's discretion, the Change of Control Payment Date may be delayed until such time as any or all such conditions shall be satisfied, or that such purchase may not occur and such notice may be rescinded in the event that any or all such conditions shall not have been satisfied by the Change of Control Payment Date, or by the Change of Control Payment Date as so delayed; and
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(9) the other instructions, as determined by the Issuer, consistent with this Section 4.07 that a Holder must follow.

(c) On the Change of Control Payment Date, the Issuer shall, to the extent permitted by law:

(1) accept for payment all Notes or portions thereof (in minimum amounts of \$2,000 or an integral multiple of \$1,000 in excess thereof) properly tendered pursuant to the Change of Control Offer;

(2) deposit with the Paying Agent an amount equal to the Change of Control Payment in respect of all Notes or portions thereof so tendered; and

(3) deliver or cause to be delivered to the Trustee for cancellation all Notes so accepted together with an Officer's Certificate stating the aggregate principal amount of Notes (or portions thereof) being purchased by the Issuer.

The Paying Agent will promptly remit to each Holder so tendered the Change of Control Payment for such Notes, and the Issuer shall execute and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall promptly authenticate and deliver (or cause to be transferred by book entry) to each Holder a new Note equal in principal amount to any unpurchased portion of the Notes surrendered, if any; *provided* that each such new Note shall be in a principal amount of \$2,000 or an integral multiple of \$1,000 in excess thereof. The Issuer shall publicly announce the results of the Change of Control Offer on or as soon as practicable after the Change of Control Payment Date.

(d) If Holders of not less than 90% in aggregate principal amount of the then outstanding Notes validly tender and do not withdraw such Notes in a Change of Control Offer and the Issuer, or any other Person making a Change of Control Offer in lieu of the Issuer as described below, purchases all of the Notes validly tendered and not withdrawn by such Holders, the Issuer or such other Person will have the right, upon not less than 10 nor more than 30 days' prior notice, given not more than 30 days following such purchase pursuant to the Change of Control Offer described above, to redeem all Notes that remain outstanding following such purchase at a redemption price in cash equal to the applicable Change of Control Payment plus, to the extent not included in the Change of Control Payment, accrued and unpaid interest to but excluding the date of redemption.

(e) Upon the payment of the Change of Control Payment, the Trustee shall, subject to the provisions of Section 2.16, return the Notes purchased to the Issuer for cancellation. The Trustee may act as the Paying Agent for purposes of any Change of Control Offer.

(f) The Issuer will not be required to make a Change of Control Offer upon a Change of Control if (1) a third party approved in writing by the Issuer makes the Change of Control Offer in the manner, at the times and otherwise in compliance with the requirements set forth in this Section 4.07 with respect to a Change of Control Offer made by the Issuer and purchases all Notes validly tendered and not withdrawn under such Change of Control Offer or (2) notice of redemption has been given or will be given pursuant to this Indenture as described in paragraph 5 of the Notes or as set forth in Section 9.01 prior to the date the Issuer is required to send notice of the Change of Control Offer to the Holders, unless and until there is a default in payment of the applicable redemption price. Notwithstanding anything to the contrary contained herein, a Change of Control Offer may be made in advance of a Change of Control, conditioned upon the consummation of such Change of Control, or such other conditions specified therein, if a definitive agreement is in place for the Change of Control at the time the Change of Control Offer is made and such Change of Control Offer is otherwise made in compliance with the provisions of this Section 4.07. The Issuer's obligation to make a Change of Control Offer shall not continue after a discharge of the Issuer, satisfaction and discharge of this Indenture or defeasance from the Issuer's obligations with respect to the Notes.

(g) The Issuer shall comply with the requirements of Rule 14e-1 under the Exchange Act and any other securities laws and regulations thereunder to the extent such laws and regulations are applicable in connection with the repurchase of the Notes as a result of a Change of Control. To the extent that the provisions of any securities laws or regulations conflict with provisions of this Section 4.07, the Issuer shall comply with the applicable securities laws and regulations and shall not be deemed to have breached its obligations under this Section 4.07 by virtue thereof.

(h) Other than as specifically provided in this Section 4.07, any purchase pursuant to this Section 4.07 shall be made pursuant to the provisions of Sections 3.02, 3.05 and 3.06.

(i) The provisions of this Section 4.07 relating to the Issuer's obligation to make a Change of Control Offer with respect to the Notes upon a Change of Control may be waived or modified with the written consent of the Holders of a majority in principal amount of the Notes.

Section 4.08 Limitation on Asset Disposition.

(a) The Issuer shall not, and shall not permit any Restricted Subsidiary to, directly or indirectly, consummate any Asset Disposition unless:

(1) the Issuer or such Restricted Subsidiary receives consideration at least equal to the Fair Market Value (such Fair Market Value to be determined in good faith by the Issuer on the date of contractually agreeing to such Asset Disposition) of the equity and assets subject to such Asset Disposition ;

(2) except in the case of a Permitted Asset Swap , at least 75% of the consideration for such Asset Disposition received by the Issuer or such Restricted Subsidiary is in the form of cash or Cash Equivalents , Additional Assets or any combination thereof (collectively, the "Cash Consideration "); and

(3) within 540 days from the later of the date of such Asset Disposition or the receipt of the Net Available Cash from such Asset Disposition , an amount equal to 100% of the Net Available Cash from such Asset Disposition is applied by the Issuer , at its option (or such Restricted Subsidiary , as the case may be):

(A) to the extent the property that is subject to such Asset Disposition (i) constitutes ABL Collateral , to repay or prepay ABL Debt , (ii) does not constitute Collateral , to repay any Indebtedness of a Non-Guarantor Subsidiary (other than Indebtedness owed to Holdings , the Issuer or another Restricted Subsidiary of the Issuer) or (iii) repay Notes ;

(B) to the extent the Issuer elects (or is required by the terms of any applicable Indebtedness), to prepay, repay, redeem or purchase any Fixed Asset Debt of the Issuer or any Guarantor , and, if the assets or property disposed of in the Asset Disposition were not Collateral , Pari Passu Indebtedness of the Issuer , or any Guarantor (other than Indebtedness referred to in clause (A) above or owed to the Issuer or another Restricted Subsidiary); *provided* such prepayment, repayment, redemption or purchase permanently retires, or reduces the related loan commitment (if any) (other than commitments in respect of any asset-based Credit Facility to the extent the assets sold or otherwise disposed of in connection with such Asset Disposition constituted "borrowing base assets") for, such Fixed Asset Debt in an amount equal to the principal amount so prepaid, repaid, redeemed or purchased; *provided, further*, that the Issuer or such Restricted Subsidiary will either (i) reduce the aggregate principal amount of the Notes on an equal or ratable basis with any Fixed Asset Debt or Pari Passu Indebtedness repaid pursuant to this clause (B) by, at its option, (x) redeeming Notes as provided under paragraph 5 of the Notes and/or (y) purchasing Notes through open-market purchases or in privately negotiated transactions and/or (ii) make an offer (in accordance with the provisions set forth below for an Offer) to all Holder s to purchase the Notes on an equal or ratable basis with any Fixed Asset Debt or Pari Passu Indebtedness repaid pursuant to this clause (B) (which offer shall be deemed to be an Offer for purposes hereof);

(C) to the extent the Issuer elects, to invest in the business of the Issuer and its Subsidiaries , including acquiring Additional Assets or making any other capital expenditures; *provided* that (x) if such investment is in the form of the acquisition of Capital Stock of a Person , such acquisition is the acquisition of Capital Stock of a Restricted Subsidiary or such acquisition results in such Person becoming a Restricted Subsidiary and (y) to the extent the investment, assets or property are of the type that would constitute Collateral , such investment, assets or property are added as Collateral pursuant to the terms of this Indenture ; *provided further* that this requirement shall be deemed satisfied if the Issuer by the end of such 540-day period has entered into a binding agreement under which it is contractually committed to acquire Additional Assets , make any other capital expenditures or investments and such acquisition, capital expenditure or investment is consummated within the later of the end of such 540-day period and within 180 days from the date on which such binding agreement is entered into; or

(D) any combination of the foregoing.

(b) For the purposes of this Section 4.08, the following are deemed to be Cash Consideration :

(1) the greater of the principal amount and the carrying value of any liabilities (as shown on the Issuer 's or any Restricted Subsidiary 's most recent balance sheet or in the footnotes thereto, or if incurred, accrued or increased subsequent to the date of such balance sheet, such liabilities that would have been reflected on the balance sheet of the Issuer or such Restricted Subsidiary or in the footnotes thereto if such incurrence, accrual or increase had taken place on or prior to the date of such balance sheet, as determined in good faith by the Issuer) (other than contingent liabilities) that are assumed by the transferee of any such assets (or are otherwise extinguished in connection with the transactions relating to such Asset Disposition) pursuant to a written agreement which releases or indemnifies the Issuer or such Restricted Subsidiary from such liabilities;

(2) any securities, notes or other obligations or assets received by the Issuer or any Restricted Subsidiary from such transferee that are converted by the Issuer or such Restricted Subsidiary into cash or Cash Equivalents , or by their terms are required to be satisfied for cash or Cash Equivalents , in each case, within 180 days after such Asset Disposition , to the extent of the cash and Cash Equivalents received in that conversion; and

(3) any Designated Non-cash Consideration received by the Issuer or any of its Restricted Subsidiaries in such Asset Disposition having an aggregate Fair Market Value , taken together with all other Designated Non-cash Consideration received pursuant to this clause that has at that time not been converted into cash or Cash Equivalents , not to exceed 5.0% of Consolidated Total Assets at the time of contractually agreeing to such Asset Disposition (with the Fair Market Value of each item of Designated Non-cash Consideration

being measured at the time of contractually agreeing to the related Asset Disposition and without giving effect to subsequent changes in value).

(c) The amount of Net Available Cash not applied or invested as provided above will constitute "Excess Proceeds." When the aggregate amount of Excess Proceeds exceeds \$25.0 million, the Issuer shall make an offer to purchase Notes (an "Offer"), and, if required or permitted by the terms of such Indebtedness, other Fixed Asset Debt and/or other Pari Passu Indebtedness within twenty Business Days thereof, and shall purchase the aggregate principal amount (or accreted value, as applicable) of Notes tendered pursuant to an Offer, Fixed Asset Debt and/or other Pari Passu Indebtedness that requires the purchase, prepayment or redemption of such Indebtedness that is, in the case of the Notes only, equal to \$1,000 or an integral multiple thereof, that may be purchased out of the Excess Proceeds at a purchase price, in the case of the Notes only, of 100% of their principal amount without premium, plus accrued but unpaid interest to but excluding, the purchase date (or, in respect of such Fixed Asset Debt or other Pari Passu Indebtedness, such lesser price, if any, as may be provided for by the terms of such Fixed Asset Debt or Pari Passu Indebtedness) in accordance with the procedures (including prorating in the event of oversubscription) set forth in this Indenture and the terms of such other Fixed Asset Debt or Pari Passu Indebtedness. The Issuer may satisfy the foregoing obligation with respect to such Excess Proceeds from an Asset Disposition by making an Offer in advance of being required to do so by this Indenture (an "Advance Offer") with respect to all or part of the available Excess Proceeds (the "Advance Portion").

(d) If any Excess Proceeds remain after consummation of an Offer and the contemporaneous offer with respect to any other Fixed Asset Debt or Pari Passu Indebtedness contemplated above, the Issuer may use those Excess Proceeds for any purpose not otherwise prohibited by this Indenture. If the aggregate principal amount (or accreted value, as applicable) of Notes, Fixed Asset Debt and/or Pari Passu Indebtedness tendered pursuant to an Offer exceeds the amount of Excess Proceeds (or in the case of an Advance Offer, the Advance Portion), the Issuer shall allocate the Excess Proceeds between the Notes, such Fixed Asset Debt and/or such Pari Passu Indebtedness on a pro rata basis but with such adjustments as necessary so that no Notes, Fixed Asset Debt or Pari Passu Indebtedness, as the case may be, will be repurchased in an unauthorized denomination and will select the Notes to be purchased on a pro rata basis but in denominations of \$1,000 principal amount or integral multiples thereof. The remainder of the Excess Proceeds allocable to the other Fixed Asset Debt or Pari Passu Indebtedness will be repurchased as provided pursuant to the terms of such Indebtedness. Upon completion of such an Offer to purchase, Excess Proceeds will be deemed to be reset to zero (regardless of whether there are any remaining Excess Proceeds upon such completion) and in the case of an Advance Offer, the Advance Portion shall be excluded in subsequent calculations of Excess Proceeds.

(e) Pending application of an amount equal to the Net Available Cash pursuant to this Section 4.08, such Net Available Cash may be applied to temporarily reduce revolving credit Indebtedness (including under the ABL Credit Facility) or in any manner not prohibited by this Indenture .

(f) The Issuer shall comply, to the extent applicable, with the requirements of Rule 14e-1 under the Exchange Act and any other securities laws and regulations thereunder to the extent such laws and regulations are applicable in connection with the repurchase of Notes pursuant to an Offer . To the extent that the provisions of any securities laws or regulations conflict with the provisions of this Section 4.08, the Issuer shall comply with the applicable securities laws and regulations and shall not be deemed to have breached its obligations under this Section 4.08 by virtue of its compliance with such securities laws or regulations.

(g) Other than as specifically provided in this Section 4.08, any purchase pursuant to this Section 4.08 shall be made pursuant to the provisions of Sections 3.02, 3.05 and 3.06.

(h) The provision of this Section 4.08 relating to the Issuer 's obligation to make an offer to repurchase the Notes as a result of an Asset Disposition may be waived or modified with the written consent of the Holder s of a majority in principal amount of Notes .

Section 4.09 Limitation on Indebtedness , Disqualified Stock and Preferred Stock .

(a) The Issuer will not, and will not permit any Restricted Subsidiary to, Incur , directly or indirectly, any Indebtedness or issue any shares of Disqualified Stock and the Issuer will not permit any of its Restricted Subsidiaries to issue any shares of Preferred Stock ; *provided, however*, that the Issuer and its Restricted Subsidiaries will be entitled to Incur Indebtedness or issue shares of Disqualified Stock and any Restricted Subsidiary may issue shares of Preferred Stock if, on the date of such Incurrence and after giving effect thereto on a *pro forma* basis, the Consolidated Fixed Charge Coverage Ratio equals or exceeds 2:00 to 1.00; *provided, further*, that the aggregate amount of Indebtedness that may be Incurred and Disqualified Stock or Preferred Stock that may be issued pursuant to the foregoing by Restricted Subsidiaries that are not Guarantors shall not exceed the greater of (x) \$105.0 million and (y) 4.25% of Consolidated Total Assets at the time of Incurrence , at any one time outstanding.

(b) Notwithstanding Section 4.09(a), the Issuer and the Restricted Subsidiaries will be entitled to Incur any or all of the following Indebtedness :

(1) Indebtedness incurred by the Issuer or its Restricted Subsidiaries pursuant to Credit Facilities, the Guarantees thereof and the issuance and creation of letters of credit and bankers' acceptances thereunder (with letters of credit and bankers' acceptances being deemed to have a principal amount equal to the face amount hereof) up to an aggregate principal amount or liquidation preference, if applicable, at any one time outstanding, (a) with respect to any ABL Obligations or any other Indebtedness that is secured by Liens on the Fixed Asset Collateral with a priority that is junior to the Liens on the Fixed Asset Collateral securing the Notes (including any Indebtedness that is secured by Liens on the ABL Collateral with a priority that is senior to the Liens on the ABL Collateral securing the Notes), not to exceed the greater of (i) \$280.0 million and (ii) the Borrowing Base as of the date of such incurrence or issuance and/or (b) with respect to any Indebtedness incurred under the Term Loan Credit Facility not to exceed \$330.0 million ((A) any Indebtedness outstanding under the ABL Credit Facility on the Issue Date after the application of the net proceeds from the sale of the Notes and any Indebtedness Incurred under the ABL Credit Facility after the Issue Date will be treated as Incurred under clause (1)(a) and (B) any Indebtedness outstanding under the Term Loan Credit Facility on the Issue Date after the application of the net proceeds from the sale of the Notes and any Indebtedness Incurred under the Term Loan Credit Facility after the Issue Date that was Incurred pursuant to clause (1)(b) will be treated as Incurred under clause (1)(b), and in each case, cannot be reclassified pursuant to clause (1) or (2) of Section 4.09(d));

(2) Indebtedness owed to and held by the Issuer or a Restricted Subsidiary or shares of Preferred Stock or Disqualified Stock of a Restricted Subsidiary issued to the Issuer or another Restricted Subsidiary; *provided, however*, that (A) any subsequent issuance or transfer of any Capital Stock which results in any such Restricted Subsidiary ceasing to be a Restricted Subsidiary or any subsequent transfer of such Indebtedness or Preferred Stock (other than to the Issuer or a Restricted Subsidiary) shall be deemed, in each case, to constitute the Incurrence of such Indebtedness by the obligor thereon not permitted pursuant to this clause (2), (B) if the Issuer is the obligor on such Indebtedness and a Subsidiary Guarantor is not the obligee thereon, such Indebtedness is expressly subordinated to the prior payment in full in cash of all obligations with respect to the Notes and (C) if a Subsidiary Guarantor is the obligor on such Indebtedness and the Issuer or a Subsidiary Guarantor is not the obligee thereon, such Indebtedness is expressly subordinated to the prior payment in full in cash of all obligations of such Subsidiary Guarantor with respect to its Subsidiary Guarantee related to the Notes;

(3) the Notes and any Subsidiary Guarantee but excluding any Additional Notes;

(4) Indebtedness outstanding on the Issue Date (other than Indebtedness described in clauses (1), (2) or (3) of this Section 4.09(b));

(5) Indebtedness, Disqualified Stock or Preferred Stock of (i) the Issuer or any of its Restricted Subsidiaries Incurred or issued to finance an acquisition or (ii) Persons that are acquired by the Issuer or any of its Restricted Subsidiaries or merged into, amalgamated with or consolidated with the Issuer or a Restricted Subsidiary in accordance with the terms hereof (including designating an Unrestricted Subsidiary as a Restricted Subsidiary); *provided, however*, that after giving effect to such acquisition, merger, amalgamation or consolidation and the Incurrence of such Indebtedness, Disqualified Stock or Preferred Stock:

(A) the Issuer would be permitted to Incur at least \$1.00 of additional Indebtedness pursuant to the Consolidated Fixed Charge Coverage Ratio test set forth in Section 4.09(a); or

(B) the Consolidated Fixed Charge Coverage Ratio of the Issuer and its Restricted Subsidiaries is equal to or greater than immediately prior to such acquisition, merger, amalgamation or consolidation;

(6) the Incurrence or issuance by the Issuer or any of its Restricted Subsidiaries of Indebtedness or Disqualified Stock or Preferred Stock of a Restricted Subsidiary of the Issuer that serves to Refinance any Indebtedness, Disqualified Stock or Preferred Stock Incurred pursuant to Section 4.09(a) or clauses (3), (4) (other than the Existing Notes), (5), this clause (6) or (12) of this Section 4.09(b), or any Indebtedness, Disqualified Stock or Preferred Stock Incurred to so Refinance such Indebtedness, Disqualified Stock or Preferred Stock, including any additional Indebtedness, Disqualified Stock or Preferred Stock Incurred to pay accrued and unpaid interest and dividends and premiums (including tender premiums), defeasance costs and fees and expenses in connection with such Refinancing (subject to the following proviso, "Refinancing Indebtedness") on or prior to its respective maturity; *provided, however*, that such Refinancing Indebtedness:

(A) has a Weighted Average Life to Maturity at the time such Refinancing Indebtedness is Incurred that is (x) not less than the remaining Weighted Average Life to Maturity of the Indebtedness, Disqualified Stock or Preferred Stock being Refinanced or (y) at least 91 days after the Weighted Average Life to Maturity of the principal of the Notes;

(B) has a Stated Maturity which is (x) no earlier than the Stated Maturity of the Indebtedness being Refinanced or (y) at least 91 days after the Stated Maturity of the principal of the Notes;

(C) to the extent such Refinancing Indebtedness is secured, the Lien s securing such Refinancing Indebtedness have a Lien priority equal to or junior to the Lien s securing the Indebtedness being refinanced; and

(D) shall not include (x) Indebtedness , Disqualified Stock or Preferred Stock of the Issuer or a Guarantor that Refinance s Indebtedness of a Restricted Subsidiary of the Issuer that is not a Guarantor or (y) Indebtedness , Disqualified Stock or Preferred Stock of the Issuer or a Restricted Subsidiary that Refinance s Indebtedness of an Unrestricted Subsidiary ;

(7) Hedging Obligations that are Incur red in the ordinary course of business (and not for speculative purposes);

(8) Indebtedness Incur red by the Issuer or any of its Restricted Subsidiaries constituting reimbursement obligations with respect to letters of credit, bankers' acceptances, bank guarantees, warehouse receipts or similar facilities entered into, or relating to obligations or liabilities incurred, in the ordinary course of business, including without limitation letters of credit in respect of workers' compensation claims, performance, completion or surety bonds, health, disability or other employee benefits (whether current or former) or property, casualty or liability insurance or self-insurance, or other Indebtedness with respect to reimbursement-type obligations regarding workers' compensation claims, performance, completion or surety bonds, health, disability or other employee benefits or property, casualty or liability insurance or self insurance; *provided, however*, that upon the drawing of such letters of credit or the incurrence of such Indebtedness , such obligations are reimbursed within 30 days following such drawing or incurrence;

(9) Indebtedness arising from the honoring by a bank or other financial institution of a check, draft or similar instrument drawn against insufficient funds in the ordinary course of business;

(10) any Guarantee by the Issuer or a Restricted Subsidiary of Indebtedness or other obligations of the Issuer or any of its Restricted Subsidiaries so long as the Incur rence of such Indebtedness or other obligations by the Issuer or such Restricted Subsidiary is permitted by this Indenture ; *provided* that if such Indebtedness is by its express terms subordinated in right of payment to the Fixed Asset Obligations , any such Guarantee of such Guarantor with respect to such Indebtedness shall be subordinated in right of payment to such Guarantor 's Guarantee of the Notes substantially to the same extent as such Indebtedness is subordinated to the Fixed Asset Obligations ;

(11) Indebtedness (including, without limitation, Capitalized Lease Obligations and mortgage financings as purchase money obligations), Incur red by the Issuer or any of its Restricted Subsidiaries , Disqualified Stock issued by the Issuer or any of its Restricted Subsidiaries and Preferred Stock issued by any Restricted Subsidiaries of the Issuer to finance

all or any part of the purchase, lease or cost of design, construction, installation, replacement, repair or improvement of property (real or personal), plant or equipment or other fixed or capital assets used or useful in the business of the Issuer or its Restricted Subsidiaries or in a Similar Business (whether through the direct purchase of assets or the Capital Stock of any Person owning such assets) in an aggregate principal amount or liquidation preference, including all Indebtedness Incurred and Disqualified Stock or Preferred Stock issued to renew, refund, refinance, replace, defease or discharge any Indebtedness Incurred and Disqualified Stock or Preferred Stock issued pursuant to this clause (11), not to exceed at any one time outstanding the greater of (x) \$95.0 million and (y) 3.75% of Consolidated Total Assets at the time of Incurrence ;

(12) Indebtedness Incurred by Foreign Subsidiaries of the Issuer in an aggregate principal amount (or accreted value, as applicable), at any time outstanding, not to exceed the greater of (x) \$95.0 million and (y) 3.75% of Consolidated Total Assets ;

(13) Indebtedness Incurred in a Permitted Receivables Financing ;

(14) Indebtedness of the Issuer or any Restricted Subsidiary consisting of (x) the financing of insurance premiums or (y) take-or-pay obligations contained in supply arrangements, in each case, in the ordinary course of business, not to exceed \$5.0 million at any one time outstanding;

(15) obligations (including reimbursement obligations with respect to letters of credit and bank guarantees) in respect of performance, bid, appeal and surety bonds, bankers' acceptance facilities and completion guarantees, customs, VAT or other tax guarantees and similar obligations provided by the Issuer or any Restricted Subsidiary or obligations in respect of letters of credit, bank guarantees or similar instruments related thereto, in each case, in the ordinary course of business;

(16) Contribution Indebtedness ;

(17) the incurrence by the Issuer or any Restricted Subsidiary of Indebtedness consisting of the Guarantees of Indebtedness incurred by Permitted Joint Ventures; *provided*, that the aggregate principal amount of Indebtedness guaranteed pursuant to this clause (17) does not at any one time outstanding exceed the greater of (x) \$40.0 million and (y) 1.75% of Consolidated Total Assets ;

(18) Guarantee s incurred in the ordinary course of business in respect of obligations to suppliers, customers, franchisees, lessors and licensees that, in each case, are non-Affiliate s;

(19) Indebtedness consisting of Indebtedness issued by the Issuer or any Restricted Subsidiary to future, current or former officers, directors, employees, managers, service providers or consultants thereof or any direct or indirect parent thereof, their respective estates, spouses or former spouses, in each case, to finance the purchase, redemption, acquisition or retirement for value of Equity Interests of the Issuer or any direct or indirect parent company of the Issuer to the extent permitted under Section 4.10(b)(3);

(20) Indebtedness representing deferred compensation to employees of the Issuer (or any direct or indirect parent thereof) and of Restricted Subsidiaries incurred in the ordinary course of business; and

(21) Indebtedness or Disqualified Stock of the Issuer or any Restricted Subsidiary of the Issuer and Preferred Stock of any Restricted Subsidiary of the Issuer in an aggregate principal amount or liquidation preference that, when aggregated with the principal amount or liquidation preference of all other Indebtedness , Disqualified Stock and Preferred Stock then outstanding and Incurred pursuant to this clause (21), does not exceed at any one time outstanding the greater of (x) \$75.0 million and (y) 3.0% of Consolidated Total Assets .

(c) Notwithstanding the foregoing, neither the Issuer nor any Subsidiary Guarantor will incur any Indebtedness pursuant to the foregoing paragraph (b) if the proceeds thereof are used, directly or indirectly, to Refinance any Subordinated Obligation s of the Issuer or any Subsidiary Guarantor unless such Indebtedness shall be subordinated to the Notes or the Subsidiary Guarantee to at least the same extent as such Subordinated Obligation s.

(d) For purposes of determining compliance with this Section 4.09:

(1) other than as set forth in Section 4.09(b)(1), in the event that an item of Indebtedness , Disqualified Stock or Preferred Stock (or any portion thereof) meets the criteria of more than one of the types of Indebtedness , Disqualified Stock or Preferred Stock described in Section 4.09(a) and Section 4.09(b) above, the Issuer , in its sole discretion, will classify such item of Indebtedness , Disqualified Stock or Preferred Stock (or any portion thereof) at the time of Incurrence and will only be required to include the amount and type of such Indebtedness in one of the above paragraphs; and

(2) other than as set forth in Section 4.09(b)(1), the Issuer will be entitled at the time of Incurrence of Indebtedness , Disqualified Stock or Preferred Stock to divide and classify an item of Indebtedness in more than one of the types of Indebtedness described above, and with respect to any Indebtedness , Disqualified Stock or Preferred Stock Incurred pursuant to any specific clause under Section 4.09(b) above, the Issuer may, after such

Indebtedness, Disqualified Stock or Preferred Stock is Incurred, reclassify all or a portion of such Indebtedness, Disqualified Stock or Preferred Stock under a different clause of Section 4.09(b) or under Section 4.09(a) but only to the extent such Indebtedness could be so Incurred under such clause of Section 4.09(b) or Section 4.09(a).

(e) For purposes of determining compliance with any U.S. dollar-denominated restriction on the Incurrence of Indebtedness, the U.S. dollar-equivalent principal amount of Indebtedness denominated in a foreign currency shall be calculated based on the relevant currency exchange rate in effect on the date such Indebtedness was Incurred, in the case of term debt, or first committed or first Incurred (whichever yields the lower U.S. dollar-equivalent), in the case of revolving credit debt; provided that if such Indebtedness is Incurred to Refinance other Indebtedness denominated in a foreign currency, and such Refinancing would cause the applicable U.S. dollar-denominated restriction to be exceeded if calculated at the relevant currency exchange rate in effect on the date of such Refinancing, such U.S. dollar-denominated restriction shall be deemed not to have been exceeded so long as the principal amount of such Refinancing Indebtedness does not exceed (i) the principal amount of such Indebtedness being Refinanced plus (ii) the aggregate amount of fees, defeasance costs, underwriting discounts, accrued and unpaid interest, premiums and other costs and expenses incurred in connection with such Refinancing.

(f) Accrual of interest, the accretion of accreted value and the payment of interest or dividends in the form of additional Indebtedness, Disqualified Stock or Preferred Stock, as applicable, will not be deemed to be an incurrence of Indebtedness, Disqualified Stock or Preferred Stock for purposes of this Section 4.09.

(g) This Indenture will not treat (1) unsecured Indebtedness as subordinated or junior to Secured Debt merely because it is unsecured or (2) senior Indebtedness as subordinated or junior to any other senior Indebtedness merely because it has a junior priority with respect to the same collateral.

Section 4.10 Limitation on Restricted Payments.

(a) The Issuer will not, and will not permit any of its Restricted Subsidiaries to, directly or indirectly, make any Restricted Payment if at the time of such Restricted Payment:

- (1) a Default or Event of Default shall have occurred and be continuing or shall occur as a consequence thereof;
-

(2) after giving effect to such Restricted Payment (including, without limitation, the incurrence of any Indebtedness to finance such Restricted Payment), the Consolidated Fixed Charge Coverage Ratio would be less than or equal to 2:00 to 1:00; or

(3) the amount of such Restricted Payment, when added to the aggregate amount of all other Restricted Payments made since November 2, 2016 (including Restricted Payments made pursuant to clauses (1) and (7) of Section 4.10(b) but excluding all other Restricted Payments permitted by Section 4.10(b)), exceeds the sum (the "Restricted Payments Basket") of (without duplication):

(A) 50.0% of Consolidated Net Income of the Issuer and its Subsidiaries determined in accordance with GAAP for the period (taken as one accounting period) commencing on October 1, 2016 to and including the last day of the fiscal quarter ended immediately prior to the date of such calculation for which consolidated financial statements are available (or, if such Consolidated Net Income shall be a deficit, minus 100.0% of such aggregate deficit), plus

(B) 100.0% of the aggregate net cash proceeds and the Fair Market Value, as determined in good faith by the Issuer, of property and marketable securities received by the Issuer from the issuance and sale of Qualified Equity Interests of the Issuer or any Parent Entity (to the extent such net cash proceeds and Fair Market Value of property and marketable securities are actually contributed to the Issuer) since November 2, 2016 or from the issue or sale of convertible or exchangeable Disqualified Stock of the Issuer or any Parent Entity (to the extent such net cash proceeds and Fair Market Value of property and marketable securities are actually contributed to the Issuer) or convertible or exchangeable debt securities of the Issuer or any Parent Entity (to the extent such net cash proceeds and Fair Market Value of property and marketable securities are actually contributed to the Issuer), in each case, that have been converted into or exchanged for Qualified Equity Interests of the Issuer or any Parent Entity, other than (A) any such proceeds which are used to redeem Notes in accordance with the first paragraph under paragraph 5 of the Notes or (B) any such proceeds received from the sale of Excluded Equity, plus

(C) 100.0% of the aggregate amount of cash and the Fair Market Value, as determined in good faith by the Issuer, of property and marketable securities contributed to the capital of the Issuer, or that becomes part of the capital of the Issuer through consolidation or merger following November 2, 2016, plus

(D) 100% of the aggregate amount received by the Issuer or any Restricted Subsidiary in cash and the Fair Market Value of marketable securities or other property received by the Issuer or any Restricted Subsidiary in each case after November 2, 2016 from:

(i) the sale or other disposition (other than to the Parent , Holdings , the Issuer or a Restricted Subsidiary of the Issuer) of Restricted Investment s made by the Issuer and its Restricted Subsidiaries and from repurchases and redemptions of, or cash distributions or cash interest received in respect thereof, such Restricted Investment s from the Issuer and its Restricted Subsidiaries by any Person (other than the Parent , Holdings , the Issuer or any of its Subsidiaries) and from repayments of loans or advances, and releases of Guarantee s, which constituted Restricted Investment s made by the Issuer or its Restricted Subsidiaries ,

(ii) the sale (other than to the Parent , Holdings , the Issuer or a Restricted Subsidiary or an employee stock ownership plan or trust established by the Issuer or any Restricted Subsidiary (other than to the extent such employee stock ownership plan or trust has been funded by the Issuer or any Restricted Subsidiary or to the extent that such Investment constituted a Permitted Investment)) of the Capital Stock of an Unrestricted Subsidiary , or

(iii) any distribution or dividend from an Unrestricted Subsidiary (to the extent such distribution or dividend is not included in the calculation of Consolidated Net Income), plus

(E) in the event any Unrestricted Subsidiary of the Issuer has been redesignated as a Restricted Subsidiary or has been merged or consolidated with or into, or transfers or conveys its assets to, or is liquidated into, the Issuer or a Restricted Subsidiary of the Issuer , in each case, after November 2, 2016, the Fair Market Value of the Investment of the Issuer in such Unrestricted Subsidiary at the time of such redesignation, combination or transfer (or of the assets transferred or conveyed, as applicable) (other than, in each case to the extent that the designation of such Subsidiary as an Unrestricted Subsidiary constituted a Permitted Investment), *plus*

(F) the aggregate amount by which Indebtedness (other than any Subordinated Indebtedness) incurred by the Issuer or any Restricted Subsidiary since November 2, 2016 is reduced on the Issuer 's balance sheet upon the conversion or exchange (other than by a Restricted Subsidiary of the Issuer) into Qualified Equity Interests of the Issuer or any Parent Entity (less the amount of any cash, or the fair value of assets, distributed by the Issuer or any Restricted Subsidiary upon such conversion or exchange), *plus*

(G) in the event the Issuer or Restricted Subsidiary makes an Investment (other than a Permitted Investment) in a Person that, as a result of or in connection with such Investment , becomes a Restricted Subsidiary , an amount equal to the Fair Market Value of the existing Investment (other than a Permitted Investment) in such Person that was previously treated as a Restricted Payment made in reliance on Section 4.10(a)(3) or Section 4.10(b)(8).

(b) The foregoing provisions will not prohibit:

(1) the payment by the Issuer of any dividend or distribution or the consummation of any redemption within 60 days after the date of declaration thereof or the giving of the redemption notice, as the case may be, if on the date of declaration or notice, the dividend, distribution or redemption payment would have complied with the provisions of this Indenture ;

(2) the redemption of any Equity Interests of the Issuer in exchange for, or out of the proceeds of the substantially concurrent issuance and sale of, Qualified Equity Interests ;

(3) payments by the Issuer to repurchase, redeem, retire or otherwise acquire Equity Interests of the Issuer or any Parent Entity held by future, present or former officers, directors, employees, managers or consultants (or their transferees, estates or beneficiaries under their estates) of the Issuer or its Subsidiaries or any Parent Entity , upon their death, disability, retirement, severance or termination of employment or service or other repurchase event pursuant to any management, director and/or employee equity plan or stock option plan, stock appreciation rights plan or any other management, director or employee benefit plan or agreement or arrangement or equity subscription or equityholder agreement (including, for the avoidance of doubt, any principal and interest payable on any Indebtedness issued by the Issuer or any Parent Entity in connection with such repurchase, retirement or other acquisition); *provided* that the aggregate cash consideration paid for all such redemptions shall not exceed (A) \$7.5 million during any calendar year (with unused amounts being available to be used in the following calendar years up to a maximum of \$15.0 million in the aggregate in any calendar year) *plus* (B) the amount of any net cash proceeds received by the Issuer from the issuance and sale after the Issue Date of Qualified Equity Interests of the Issuer or any Parent Entity to future, present or former officers, directors, employees, managers or consultants (or their transferees, estates or beneficiaries under their estates) of the Issuer or the Subsidiaries or any Parent Entity that have not been applied to the payment of Restricted Payments pursuant to this clause (c), plus (C) the net cash proceeds of any "key-man" life insurance policies received after the Issue Date that have not been applied to the payment of Restricted Payments pursuant to this clause (c); *provided*, that cancellation of Indebtedness owing to the Issuer or its Subsidiaries or any Parent Entity from any future, current or former officer, director, employee, manager or consultant (or any permitted transferees thereof) of the Issuer or any of its Subsidiaries or any Parent Entity , in connection with a repurchase of Equity Interests of the Issuer or any Parent Entity, from such Person s will be deemed to constitute a Restricted Payment for purposes of this Section 4.10 or any other provisions of this Indenture ;

(4) repurchases, acquisitions or retirements for value of Equity Interests deemed to occur upon the exercise of stock options, warrants, rights to acquire Equity Interests or other convertible securities if the Equity Interests represents a portion of the exercise price thereof, or in connection with the withholding of a portion of the Equity Interests granted or awarded to a director, employee, manager or consultant (or their transferees, estates or beneficiaries under their estates) to pay for the taxes payable by such director, employee, manager or consultant upon such grant or award;

(5) Restricted Payments to allow the payment of cash in lieu of the issuance of fractional shares upon (i) the exercise of options or warrants or (ii) the conversion or exchange of Equity Interests of any Person (including in connection with a dividend, distribution, share split, reverse share split, merger, consolidation, amalgamation or similar transaction) and payments of cash to dissenting shareholders in connection with a merger, consolidation, amalgamation, transfer of assets;

(6) [Reserved];

(7) the declaration and payment of dividends on the Issuer's common stock (or the payment of dividends to any Parent Entity to fund a payment of dividends on such entity's common stock) of up to \$10.0 million per annum;

(8) Restricted Payments in an amount not to exceed \$25.0 million since the Issue Date ;

(9) Restricted Payments that are made in an amount equal to the amount of Excluded Contributions ;

(10) the payment or distribution of Receivables Fees ;

(11) the declaration and payment of dividends or distributions by the Issuer to, or the making of loans to, any Parent Entity in amounts required for any Parent Entity to pay or cause to be paid, in each case, without duplication,

(A) franchise, excise and similar taxes and other fees, taxes and expenses, in each case, required to maintain their corporate or other legal existence;

(B) for any taxable period for which the Issuer and/or any of its Restricted Subsidiaries are members of a consolidated, combined or unitary tax group for U.S. federal and/or applicable state, local, provincial, territorial or foreign income or similar tax purposes of which a Parent Entity is the common parent (a "Tax Group"), the portion of any U.S. federal, state, local, provincial, territorial or foreign income or similar taxes (as applicable) of such Tax Group for such taxable period that are attributable to the taxable income of the Issuer and/or its Subsidiaries ; *provided* that for each taxable period, (A) payments made pursuant to this subclause (2) shall

not exceed the amount of liability that the Issuer and/or its Subsidiaries (as applicable) would have incurred were such taxes determined as if such entity(ies) were a stand-alone taxpayer or a stand-alone group, which amount shall be reduced by any such tax directly paid by the Issuer or any of its Subsidiaries and (B) the amount of such payments made in respect of an Unrestricted Subsidiary will be permitted only to the extent that cash distributions were made by such Unrestricted Subsidiary to the Issuer or any Restricted Subsidiary for such purpose;

(C) customary salary, bonus, severance and other benefits payable to, and indemnities provided on behalf of, future, current or former officers, employees, directors, managers and consultants of any Parent Entity to the extent such salaries, bonuses, severance and other benefits and indemnities are attributable to the ownership or operation of the Issuer and its Subsidiaries, including the Issuer's or its Subsidiaries' proportionate share of such amount relating to such Parent Entity being a public company;

(D) general corporate, operating and other costs and expenses (including, without limitation, expenses related to the maintenance of corporate or other existence and auditing or other accounting or tax reporting matters) and listing fees and other costs and expenses attributable to being a public company, of any Parent Entity ;

(E) amounts required for any Parent Entity to pay interest and/or principal on Indebtedness, the proceeds of which have been contributed to the Issuer (other than as Disqualified Stock) and that has been guaranteed by, and is otherwise considered Indebtedness of, the Issuer or any Restricted Subsidiary ;

(F) fees and expenses related to any equity or debt offering, financing transaction, acquisitions, divestitures, investments or other non-ordinary course transaction (whether or not successful) of such Parent Entity ; *provided* that any such acquisition or investment was intended to be for the benefit of the Issuer and its Subsidiaries ; and

(G) any Restricted Payment permitted by Section 4.10(b)(3);

(12) other Restricted Payment s if, at the time of the making of such payments, and after giving effect thereto (including, without limitation, the incurrence of any Indebtedness to finance such payment), the Total Net Leverage Ratio would not exceed 2.00 to 1.00; or

(13) the declaration and payment of dividends or distributions to holders of any class or series of Designated Preferred Stock and the declaration and payment of dividends to Holdings or any other Parent Entity, the proceeds of which will be used to fund the payment of dividends to holders of any class or series of Designated Preferred Stock of Holdings or any other Parent Entity issued after the Issue Date; provided, however, that (A) for the Four-Quarter Period immediately preceding the date of issuance of such Designated Preferred Stock, after giving effect to such issuance (and the payment of dividends or distributions) on a pro forma basis, the Consolidated Fixed Charge Coverage Ratio of the Issuer and its Restricted Subsidiaries would have been at least 2.00 to 1.00 and (B) the aggregate amount of dividends declared and paid pursuant to this clause (m) does not exceed the net cash proceeds actually received by the Issuer from the sale (or the contribution of the net cash proceeds from the sale) of Designated Preferred Stock;

provided that (x) in the case of any Restricted Payment pursuant to clauses (8) and (12) of this Section 4.10(b), no Default or Event of Default shall have occurred and be continuing or occur as a consequence thereof, (y) no issuance and sale of Qualified Equity Interests that are used to make a payment pursuant to clauses (2) or (3)(B) of this Section 4.10(b) shall increase the Restricted Payments Basket and (z) in the case of any Restricted Payment pursuant to clause (12) of this Section 4.10(b), such Restricted Payment shall not be made pursuant to clause (12) of this Section 4.10(b) prior to the utilization of any amounts available for such Restricted Payment under the Restricted Payments Basket or under clauses (1) through (11) or clause (13) of this Section 4.10(b).

(c) For purposes of determining compliance with this Section 4.10, in the event that a proposed Restricted Payment (or a portion thereof) meets the criteria of more than one of the categories of Restricted Payments described in the preceding clauses (1) through (13) of Section 4.10(b) and/or is entitled to be made pursuant to Section 4.10(a), the Issuer will be entitled to divide or classify (or later divide, classify or reclassify in whole or in part in their sole discretion) such Restricted Payment (or a portion thereof) among such clauses (1) through (13) of Section 4.10(b) and/or Section 4.10(a), in a manner that otherwise complies with this Section 4.10.

(d) The amount of all Restricted Payments (other than cash) will be the Fair Market Value on the date of the Restricted Payment of the assets or securities proposed to be transferred or issued by the Issuer or any Restricted Subsidiary, as the case may be, pursuant to the Restricted Payment.

Section 4.11 Limitation on Restrictions on Distributions from Restricted Subsidiaries.

(a) The Issuer will not, and will not permit any Restricted Subsidiary that is not a Guarantor to, create or otherwise cause or permit to exist or become effective any consensual encumbrance or consensual restriction on the ability of any Restricted Subsidiary that is not a Guarantor (directly or indirectly) to (A) pay dividends or make any other distributions on its Capital Stock to the Issuer or a Restricted Subsidiary or pay any Indebtedness owed to the Issuer or any of its Restricted Subsidiaries (it being understood that the priority of any Preferred Stock in receiving dividends or liquidating distributions prior to dividends or liquidating distributions being paid on common stock shall not be deemed a restriction on the ability to make distributions on Capital Stock), (B) make any loans or advances to the Issuer (it being understood that the subordination of loans or advances made to the Issuer or any Restricted Subsidiary to other Indebtedness Incur red by the Issuer or any Restricted Subsidiary shall not be deemed a restriction on the ability to make loans or advances) or (C) sell, lease or transfer any of its property or assets to the Issuer or any of its Restricted Subsidiaries , except:

(1) with respect to clauses (a)(A), (a)(B) and (a)(C):

(A) (x) any encumbrance or restriction pursuant to an agreement in effect at or entered into on the Issue Date , including pursuant to the ABL Credit Facility and the related documentation and related Hedging Obligations and Cash Management Obligations , the Term Loan Credit Facility and the related documentation, the Existing Notes Indenture and the related documentation and (y) this Indenture , the Notes , the Guarantee s and the Notes Security Documents ;

(B) any encumbrance or restriction with respect to a Restricted Subsidiary or the property or assets acquired by the Issuer or any of its Restricted Subsidiaries existing on or prior to the date on which such Restricted Subsidiary was acquired by the Issuer (other than Indebtedness Incur red as consideration in, or to provide all or any portion of the funds or credit support utilized to consummate, the transaction or series of related transactions pursuant to which such Restricted Subsidiary became a Restricted Subsidiary or was acquired by the Issuer) and outstanding on such date and any amendments, modification, restatements, renewals, extensions, increases, supplements, refunding, replacements or refinancing thereof; provided that the encumbrances and restrictions in any such amendments, modifications, restatements, renewals, extensions, increases, supplements, refunding, replacements or refinancing are entered into in the ordinary course of business or not materially more restrictive, taken as a whole, than those contained in the ABL Credit Facility , the Term Loan Credit Facility , this Indenture , the Existing Notes Indenture , existing Indebtedness or such other agreements as in effect on the date of the acquisition;

(C) any encumbrance or restriction pursuant to an agreement effecting a Refinancing of Indebtedness Incurred pursuant to an agreement referred to in clause (a) or (b) of clause (1) of this Section 4.11 or this clause (c) or contained in any amendment, modification, restatement, renewal, extension, increase, supplement, refunding, or replacement of an agreement referred to in clause (a) or (b) of clause (1) of this Section 4.11 or this clause (c); *provided, however*, that the encumbrances and restrictions with respect to such Restricted Subsidiary contained in any such refinancing agreement or amendment, modification, restatement, renewal, extension, increase, supplement, refunding, or replacement are not materially more restrictive on the whole to the Holders than encumbrances and restrictions with respect to such Restricted Subsidiary contained in such predecessor agreements on the Issue Date ;

(D) existing under, by reason of or with respect to Refinancing Indebtedness ; provided, that the encumbrances and restrictions contained in the agreements governing such Refinancing Indebtedness are not materially more restrictive, taken as a whole, than those contained in the agreements governing the Indebtedness being refinanced;

(E) provisions restricting cash or other deposits or net worth imposed by customers under contracts entered into in the ordinary course of business;

(F) existing under, by reason of or with respect to customary provisions contained in leases or licenses of intellectual property and other agreements, in each case, entered into in the ordinary course of business;

(G) agreements entered into between a Foreign Restricted Subsidiary and another Foreign Restricted Subsidiary which second Foreign Restricted Subsidiary is not a Subsidiary of the first Foreign Restricted Subsidiary to the extent such agreements relate solely to such Foreign Subsidiaries and do not affect in any material respect the Issuer's or any Subsidiary Guarantor's ability to make principal and interest payments on the Notes , as determined in good faith by the Issuer ;

(H) any encumbrance or restriction with respect to a Restricted Subsidiary imposed pursuant to an agreement entered into for the sale or disposition of some or all of the Capital Stock or any property and assets of such Restricted Subsidiary pending the closing of such sale or disposition;

(I) with respect to any Foreign Subsidiary , any encumbrance or restriction contained in the terms of any Indebtedness permitted to be Incurred under this Indenture , or any agreement pursuant to which such Indebtedness was issued;

(J) restrictions or conditions governing any Indebtedness Incurred in connection with Permitted Receivables Financing if such restrictions or conditions apply only to the Receivables Assets that are the subject of the Permitted Receivables Financing , and

restrictions or conditions imposed on any Receivables Subsidiary in connection with any Permitted Receivables Financing ;

(K) provisions limiting the disposition or distribution of assets or property or transfer of Capital Stock in joint venture agreements, asset sale agreements, sale-leaseback agreements, stock sale agreements, limited liability company organizational documents, and other similar agreements entered into in the ordinary course of business, consistent with past practice or with the approval of the Board of Directors of the Issuer (or the Board of Directors of any Parent Entity), which limitation is applicable only to the assets, property or Capital Stock that are the subject of such agreements;

(L) restrictions on cash, Cash Equivalents or other deposits or net worth imposed by customers or lessors under contracts or leases entered into in the ordinary course of business;

(M) customary provisions in joint venture agreements, operating or similar agreements, asset sale agreements and stock sale agreements arising in connection with the entering into of such transactions;

(N) any restriction arising under applicable law, rule, regulation or administrative or court order;

(O) any encumbrance or restriction existing under or by reason of the ABL Credit Facility or the Term Loan Credit Facility ;

(P) any encumbrance or restriction existing under any other Indebtedness , Disqualified Stock or Preferred Stock of the Issuer or any Restricted Subsidiary that is incurred subsequent to the Issue Date pursuant to the provisions of Section 4.09; provided that either (A) the provisions relating to such encumbrance or restriction contained in such Indebtedness are no less favorable to the Issuer , taken as a whole, as determined by the Issuer in good faith, than the provisions contained in the ABL Credit Facility , the Term Loan Credit Facility or the Existing Notes Indenture , in each case, as in effect on the Issue Date or (B) any encumbrance or restriction contained in such indebtedness that does not (except upon a default or event of default thereunder) materially impair the Issuer 's ability, as determined by the Issuer in good faith, to make payments of interest and principal on the Notes when due;

(Q) any encumbrance or restriction with respect to a Subsidiary which was previously an Unrestricted Subsidiary pursuant to or by reason of an agreement that such Subsidiary is a party to or entered into before the date on which such Subsidiary became a Restricted Subsidiary ; provided that such agreement was not entered into in anticipation of an Unrestricted Subsidiary becoming a Restricted Subsidiary and any such encumbrance or restriction does not extend to any assets or

property of the Issuer or any other Restricted Subsidiary other than the assets and property of such Subsidiary ; and

(R) any encumbrance or restriction contained in security agreements or mortgages securing Indebtedness of a Restricted Subsidiary to the extent such encumbrance or restriction restricts the transfer of the property subject to such security agreements or mortgages;

(2) with respect to clause (a)(C) above:

(A) any encumbrance or restriction consisting of customary nonassignment provisions in leases governing leasehold interests to the extent such provisions restrict the transfer of the lease or the property leased thereunder;

(B) any encumbrance or restriction existing by virtue of any transfer of, agreement to transfer, option or right with respect to, or Lien on, any property or assets of the Issuer or any Restricted Subsidiary thereof not otherwise prohibited by this Indenture ;

(C) any encumbrance or restriction existing under, by reason of or with respect to (i) purchase money obligations for property acquired in the ordinary course of business or (ii) capital leases or operating leases that impose encumbrances or restrictions on the property so acquired or covered thereby;

(D) any encumbrance or restriction arising or agreed to in the ordinary course of business, not relating to any Indebtedness , and that do not, individually or in the aggregate, detract from the value of property or assets of the Issuer or any Restricted Subsidiary thereof in any manner material to the Issuer or any Restricted Subsidiary thereof;

(E) non-assignment provisions or subletting restrictions in contracts, leases and licenses entered into in the ordinary course of business;

(F) encumbrances on property that exist at the time the property was acquired by the Issuer or a Restricted Subsidiary , provided such encumbrances were not put in place in anticipation of such acquisition;

(G) customary provisions in asset sale agreements and stock sale agreements arising in connection with the entering into of such transactions; and

(3) any encumbrances or restrictions of the type referred to in clauses (a)(A), (a)(B) and (a)(C) above imposed by any amendments, modifications, restatements, renewals, increases, supplements, refundings, replacements or refinancings of the contracts, instruments or obligations referred to in Sections 4.11(a)(1) and 4.11(a)(2); *provided* that such amendments, modifications, restatements, renewals, increases, supplements, refundings, replacements or refinancings (other than with respect to the ABL Credit Facility or the Term Loan Credit Facility) are, in the good faith judgment of the Issuer , no more restrictive on the whole with respect to such dividend and other payment restrictions than those contained in the dividend or other payment restrictions prior to such amendment, modification, restatement, renewal, increase, supplement, refunding, replacement or refinancing.

Section 4.12 Limitation on Affiliate Transactions.

(a) The Issuer will not, and will not permit any Restricted Subsidiary to, enter into or permit to exist any transaction or series of related transactions (including the purchase, sale, lease or exchange of any property, employee compensation arrangements or the rendering of any service) with any Affiliate of the Parent (an "Affiliate Transaction") involving aggregate consideration in excess of \$10.0 million, either directly or indirectly, unless:

(1) the terms of the Affiliate Transaction are no less favorable to the Issuer or such Restricted Subsidiary , taken as a whole, than those that could be obtained at the time of the Affiliate Transaction in arm's-length dealings with a Person who is not an Affiliate ; and

(2) if such Affiliate Transaction involves an amount in excess of \$25.0 million, the terms of the Affiliate Transaction are set forth in writing and a majority of the non-employee directors of the Issuer disinterested with respect to such Affiliate Transaction have determined in good faith that the criteria set forth in clause (1) of this Section 4.12 are satisfied and have approved the relevant Affiliate Transaction as evidenced by a resolution of the Board of Directors of the Issuer .

(b) The provisions of Section 4.12(a) will not prohibit:

(1) any Permitted Investment or Restricted Payment permitted to be made pursuant to the covenant described under Section 4.10;

(2) any payments, awards or grants in cash, securities or otherwise pursuant to, or the funding of, employment arrangements, employee benefit plans, stock options and stock ownership plans in the ordinary course of business or consistent with past practice;

- (3) loans or advances to employees in the ordinary course of business in accordance with the past practices of the Issuer or its Restricted Subsidiaries ;
- (4) the payment of reasonable fees to, and indemnity provided on behalf of, directors, officers, employees and consultants of the Issuer and its Restricted Subsidiaries who are not employees of the Issuer or its Restricted Subsidiaries in the ordinary course of business;
- (5) any transaction with the Issuer , a Restricted Subsidiary or joint venture or similar entity which would constitute an Affiliate Transaction solely because the Issuer or a Restricted Subsidiary owns an Equity Interest in or otherwise controls such Restricted Subsidiary , joint venture or similar entity;
- (6) the issuance or sale of any Capital Stock (other than Disqualified Stock) of the Issuer and the granting and performance of registration rights;
- (7) pledges of Capital Stock of Unrestricted Subsidiaries for the benefit of lenders of Unrestricted Subsidiaries ;
- (8) any agreement as in effect on the Issue Date and described in the Offer ing Memorandum or any renewals or extensions of any such agreement (so long as such renewals or extensions, taken as a whole, are not less favorable to the Issuer or the Restricted Subsidiaries) and the transactions evidenced thereby; and
- (9) any transaction for which the Issuer has received a written opinion from an Advisory Firm the effect that such transaction is fair, from a financial standpoint, to the Issuer and its Restricted Subsidiaries or is not less favorable to the Issuer and its Restricted Subsidiaries than could reasonably be expected to be obtained at the time in an arm's length transaction with a Person who was not an Affiliate .

Section 4.13 Limitation on Lien s.

(a) The Issuer will not at any time create, incur, assume or guarantee, and will not cause or permit a Restricted Subsidiary that is a Guarantor to, directly or indirectly Incur any Lien securing Indebtedness of the Issuer or such Guarantor upon any of its property, assets or revenue, whether owned on the Issue Date or thereafter acquired (except Permitted Lien s). If the Issuer or a Guarantor creates any Lien upon any property or assets that are not at such time Collateral in order to secure any ABL Obligations or Fixed Asset Obligations (other than customary Lien s on cash collateral in connection with the ABL Credit Facility and other revolving facilities), it must concurrently grant a first-priority Lien upon such property or assets that would constitute Fixed Asset Collateral or a second-priority Lien upon such property or assets that would constitute ABL Collateral , respectively, in each case, as security for the Notes or the Note Guarantee , such that the property or assets subject to

such Lien will constitute Collateral under this Indenture and the Notes Security Documents , subject, in each case, to local law limitations and Permitted Lien s .

(b) The following shall constitute "Permitted Lien s ":

(1) Lien s on property or assets acquired, constructed, developed or improved after the Issue Date by the Issuer or a Restricted Subsidiary and created prior to or contemporaneously with, or within 180 days after, the acquisition of property which is a parcel of real property, a building, machinery or equipment, and extensions, renewals and replacements of any such Lien s so long as such Lien s are not extended to any other property of the Issuer or any of its Restricted Subsidiaries ;

(2) Lien s on property or assets at the time of acquisition which secure obligations assumed by the Issuer or a Restricted Subsidiary , or on the property, assets or on the Equity Interests or indebtedness of a Person at the time it becomes a Restricted Subsidiary or is merged into or consolidated with the Issuer or a Restricted Subsidiary , or on properties of a Person acquired by the Issuer or a Restricted Subsidiary as an entirety or substantially as an entirety; *provided* that the Lien s may not extend to any other property of the Issuer or Restricted Subsidiary other than proceeds and products of such property, shares or indebtedness and accessions thereto, and extensions, renewals and replacements of any such Lien s so long as such Lien s are not extended to any other property of the Issuer or any of its Restricted Subsidiaries ;

(3) Lien s arising from conditional sale, title retention, consignment or similar agreements or arrangements for the sale of goods entered into in the ordinary course of business;

(4) Lien s in favor of the Issuer or any Guarantor ;

(5) Lien s Incur red to secure obligations in respect of Indebtedness permitted to be Incur red pursuant to Section 4.09(b)(1), Section 4.09(b)(11) and Section 4.09(b)(12); *provided* that, (x) in the case of Section 4.09(b)(11), such Lien extends only to the assets and/or Capital Stock , the acquisition, lease, construction, repair, replacement or improvement of which is financed thereby and any income or profits thereof; and (y) in the case of Section 4.09(b)(12), such Lien does not extend to the property or assets (or income or profits therefrom) of any Restricted Subsidiary other than a Foreign Subsidiary ;

(6) Lien s existing on the Issue Date (other than Lien s to secure obligations in respect of the ABL Credit Facility and the Term Loan Credit Facility) and extensions, renewals and replacements of any such Lien s so long as such Lien s are not extended to any other property of the Issuer or any of its Restricted Subsidiaries ;

(7) any Lien arising by reason of deposits with, or the giving of any form of security to, any governmental agency or any body created or approved by law or governmental regulations, which is required by law or governmental regulation as a condition to the transaction of any business, or the exercise of any privilege, franchise or license;

(8) Lien s of carriers', warehousemen's, mechanics, suppliers' materialmen, repairmen and other Lien s imposed by law arising in the ordinary course of business (including construction of facilities) in respect of obligations that are not due, that are not yet delinquent for a period of more than 60 days or that are being contested in good faith;

(9) Lien s for taxes, assessments or governmental charges or claims (a) that are not yet delinquent for a period of more than 30 days, (b) not yet payable or subject to penalties for non-payment or (c) that are being contested in good faith;

(10) Lien s (including judgment Lien s) arising in connection with legal proceedings so long as such proceedings are being contested in good faith or, in the case of judgment Lien s, execution thereon is stayed or not giving rise to an Event of Default ;

(11) landlords' Lien s on fixtures on premises leased in the ordinary course of business;

(12) Lien s to secure the performance of statutory obligations, insurance, surety or appeal bonds, performance bonds, or other obligations of a like nature incurred in the ordinary course of business (including Lien s to secure letters of credit issued to assure payment of such obligations);

(13) Lien s on assets of the Issuer or any of its Restricted Subsidiaries securing Indebtedness consisting of Hedging Obligations or Treasury Management Arrangement s;

(14) minor survey exceptions, easements or reservations of, or rights of others for, licenses, rights-of-way, minor defects or irregularities in title, sewers, electric lines, telegraph and telephone lines and other similar purposes, or zoning or other restrictions as to the use of, charges or encumbrances in respect of, real property that do not materially impair the use of said properties in the operation of the business of the Issuer and its Restricted Subsidiaries ;

- (15) Lien s on insurance policies and proceeds thereof, or other deposits, to secure insurance premium financings;
 - (16) filing of UCC financing statements as a precautionary measure in connection with operating leases or consignments;
 - (17) bankers' Lien s and rights of setoff or Lien s that are contractual rights of set-off relating to purchase orders and other agreements entered into with customers of the Issuer or any of its Restricted Subsidiaries in the ordinary course of business;
 - (18) Lien s in cash, Cash Equivalents or other property arising in connection with the defeasance, discharge or redemption of Indebtedness ;
 - (19) Lien s on specific items of inventory or other goods (and the proceeds thereof) of the Issuer or a Restricted Subsidiary securing such Person 's obligations in respect of bankers' acceptances or trade-related letters of credit issued or created for the account of such Person to facilitate the purchase, shipment or storage of such inventory or other goods;
 - (20) grants of intellectual property licenses (including software and other technology licenses) in the ordinary course of business;
 - (21) Lien s incurred or pledges or deposits made in the ordinary course of business in connection with workers' compensation, unemployment and other insurance and other types of social security and employee health and disability benefits or similar obligations (including Lien s to secure letters of credit issued to assure payment of such obligations and also including pledges or deposits securing liability to insurance carriers under insurance or self-insurance arrangements) or to secure the performance of tenders, statutory obligations, surety and appeal bonds, bids, leases, government contracts, performance and return-of-money bonds and other similar obligations;
 - (22) deposits made in the ordinary course of business to secure liability to insurance carriers;
 - (23) Lien s to secure partial, progress, advance or other payments or any indebtedness incurred for the purpose of financing all or any part of the purchase price or the cost of construction, development, or substantial repair, alteration or improvement of the property subject to such Lien s if the commitment for the financing is obtained not later than 180 days after the later of the completion of or the placing into operation (exclusive of test and start-up periods) of such property;
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(24) Lien s in cash proceeds (or securities purchased therewith) from Indebtedness which are set aside at the time of such incurrence in order to secure an escrow arrangement pursuant to which such cash proceeds (or securities purchased therewith) are contemplated to ultimately be released to the Issuer or a Restricted Subsidiary or returned to the lenders of such Indebtedness ; provided that such Lien s are automatically released concurrently with the release of such cash proceeds (or securities purchased therewith) from such escrow arrangement;

(25) any interest or title of a lessor under any lease, whether or not characterized as capital or operating; provided that such Lien s do not extend to any property or assets which is not leased property subject to such lease;

(26) Lien s encumbering deposits made to secure obligations arising from statutory, regulatory, contractual or warranty requirements of the Issuer or a Restricted Subsidiary , including rights of offset and set-off;

(27) leases or subleases granted to others not interfering in any material respect with the business of the Issuer or a Restricted Subsidiary ;

(28) Lien s in favor of customs and revenue authorities arising as a matter of law to secure payment of custom duties in connection with importation of goods;

(29) Lien s encumbering initial deposits and margin deposits, and other Lien s incurred in the ordinary course of business and that are within the general parameters customary in the industry;

(30) any encumbrance or restriction (including put and call arrangements) with respect to Equity Interests of any joint venture or similar arrangement;

(31) Lien s solely on any cash earnest money deposits made by the Issuer or a Restricted Subsidiary in connection with any letter of intent or purchase agreement;

(32) Lien s in respect of cash-pooling arrangement outside of the United States covering assets of Restricted Subsidiaries ;

(33) Lien s on account receivables and Receivables Assets incurred in connection with a Permitted Receivables Financing ;

(34) Lien s on equipment of the Issuer or any Restricted Subsidiary of the Issuer granted in the ordinary course of business to Issuer 's or such Restricted Subsidiary 's client at which such equipment is located;

(35) Lien s (a) of a collection bank arising under Section 4-210 of the UCC or any comparable or successor provision on items in the course of collection, (b) attaching to pooling, commodity trading accounts or other commodity brokerage accounts incurred in the ordinary course of business or consistent with past practice and (c) in favor of a banking or other financial institution or electronic payment service providers arising as a matter of law or under general terms and conditions encumbering deposits (including the right of setoff) and that are within the general parameters customary in the banking or finance industry;

(36) Lien s in favor of the Trustee or Lien s securing the Notes and the Guarantee s issued on the Issue Date ;

(37) Lien s to secure any refinancing, refunding, extension, renewal, replacement, repaying, prepaying, purchasing, redeeming, defeasing or retiring (or successive refinancings, refundings, extensions, renewals or replacements) as a whole, or in part, of any Indebtedness secured by any Lien (other than clause (5)); *provided, however*, that (x) such new Lien shall be limited to all or part of the same property that secured the original Lien (plus improvements on such property), and (y) the Indebtedness secured by such Lien at such time is not increased to any amount greater than the sum of (A) the outstanding principal amount or, if greater, committed amount of the Indebtedness described under Section 4.09(b)(5) and Section 4.09(b)(13) at the time the original Lien became a Permitted Lien under this Indenture , and (B) an amount necessary to pay any fees and expenses, including premiums, related to such refinancing, refunding, extension, renewal or replacement;

(38) other Lien s securing Indebtedness Incurred, in an aggregate principal amount for the Issuer and its Restricted Subsidiaries not exceeding at the time such Lien is created or assumed the greater of (x) \$75.0 million and (y) 3.0% of Consolidated Total Assets ; or

(39) Lien s in respect of Junior Indebtedness of the Issuer or any Guarantor ; provided that the Senior Secured Net Leverage Ratio , on a pro forma basis after giving effect thereto, does not exceed 3.50 to 1.00;

provided that (i) any Lien s on the Collateral incurred pursuant to clause (38) or (39) of this Section 4.13(b), as applicable, above shall be (w) *pari passu* or junior to the Lien s on the Fixed Asset Collateral securing the Notes , (x) if such Lien s are *pari passu* with the Lien s on the Collateral securing the Notes , the representative of the obligations secured thereby executes a customary first lien intercreditor agreement that is substantially similar to the Pari Passu Intercreditor Agreement , (y) if such Lien s are secured on the Collateral on a junior basis to the Lien s on the Collateral securing the Notes , the representative of the obligations secured thereby enters into a customary junior lien intercreditor agreement that is substantially similar to the Relative Priority Intercreditor Agreement (except for the priority of Lien s), and (z) in the case of any Lien s on Collateral incurred pursuant to clause (38) of this Section 4.13(b) that is secured on a senior basis to the Lien s on the ABL Collateral securing the Notes , such Lien s shall be junior to the Lien s on the Fixed Asset Collateral securing the Notes and shall be subject to the Relative Priority Intercreditor Agreement or another intercreditor agreement that is substantially similar thereto and (ii) in the case of any Lien s described in clause (5) of this Section 4.13(b) that (x) secure Indebtedness incurred pursuant to Section 4.09(b)(1)(a), such

Lien s shall be junior to the Lien s on the Fixed Asset Collateral securing the Notes and shall be subject to the Relative Priority Intercreditor Agreement or another intercreditor agreement that is substantially similar thereto and (y) secure Indebtedness incurred pursuant to Section 4.09(b)(1)(b), the priority of such Lien s shall be no greater than the Lien s on the Collateral securing the Notes and, if secured by any assets constituting Collateral , shall be subject to the applicable intercreditor and designation requirements set forth in clause (i) of this proviso as if such Lien s were incurred under the clauses referenced thereunder.

(c) Additionally, such permitted Secured Debt includes any extension, renewal or refunding, in whole or in part, of any Secured Debt permitted at the time of the original incurrence thereof; *provided* that the Lien securing the extended, renewed or refunded Secured Debt is limited to all or part of the same property and assets that secured or, under the written agreements pursuant to which the original Lien arose, could secure the original Lien (plus improvements, additions and accessions to such property or proceeds, distributions or products thereof).

(d) Any Lien created for the benefit of the Holder s pursuant to this Section 4.13 shall provide by its terms that such Lien shall be unconditionally and automatically released and discharged upon (i) the release and discharge of the initial Lien that gave rise to the obligation to secure the Notes , (ii) in the case of any such Lien in favor of any Note Guarantee , the termination and discharge of such Note Guarantee in accordance with the terms of this Indenture or (iii) any sale, exchange or transfer (other than a transfer constituting a transfer of all or substantially all of the assets of the Issuer that is governed by the provisions of Article V) to any Person not an Affiliate of the Issuer of the property or assets secured by such Lien , or of all of the Capital Stock held by the Issuer or any of its Restricted Subsidiaries in, or all or substantially all of the assets of, any Restricted Subsidiary creating such Lien .

(e) For purposes of determining compliance with this Section 4.13, a Lien securing an item of Indebtedness need not be permitted solely by one category of Permitted Lien but may be permitted in part under any combination thereof and of any other available exemption, and if a Permitted Lien meets the criteria or more than one of the exceptions described in clauses (1) through (39) of Section 4.13(b), the Issuer may, in its sole discretion, classify or reclassify the Permitted Lien (or any portion thereof) in any manner that complies with this Section 4.13. In addition, in the event that a portion of Indebtedness secured by a Lien that is incurred after the Issue Date could be classified as secured in part pursuant to clause (39) of Section 4.13(b) (after giving effect to the Incurrence of such portion of Indebtedness), the Issuer , in its sole discretion, may classify such portion of such Indebtedness (and any Obligations in respect thereof) as having been secured pursuant to clause (39) of Section 4.13(b) above and thereafter the remainder of the Indebtedness as having been secured pursuant to one or more of the other clauses of Section 4.13(b) above; *provided, however*, that any Lien s Incurred to secure obligations in respect of the ABL Credit Facility and the Term Loan Credit Facility Incurred pursuant to Section 4.09(b)(1) shall be deemed secured under clause (5) of Section 4.13(b) and cannot be reclassified.

Section 4.14 Limitation on Activities of Parent and Holdings.

(a) Each of Parent and Holdings shall not conduct, transact or otherwise engage in any material business or operations; provided that the following shall be permitted in any event:

- (1) its ownership of the Capital Stock of Holdings , the Issuer and the Restricted Subsidiaries , as applicable;
 - (2) the performance of its obligations with respect to the Existing Notes Indenture , any documentation relating to any permitted Refinancing of the foregoing or documentation relating to the Indebtedness otherwise permitted by this Section 4.14 and the Guarantee s permitted by clause (5) of this Section 4.14(a);
 - (3) the consummation of the issuance of the Notes ;
 - (4) the performing of activities (including, without limitation, cash management activities) and the entry into documentation with respect thereto, in each case, permitted by this Indenture for Parent or Holdings , as applicable, to enter into and perform;
 - (5) the payment of dividends and distributions (and other activities in lieu thereof permitted by this Indenture), the making of contributions to the capital of its Subsidiaries and Guarantee s of Indebtedness permitted to be incurred hereunder by Parent , the Issuer or any of the Restricted Subsidiaries and the Guarantee s of other obligations not constituting Indebtedness ;
 - (6) the maintenance of its legal existence (including the ability to incur fees, costs and expenses relating to such maintenance and performance of activities relating to its officers, directors, managers and employees and those of its Subsidiaries);
 - (7) the performing of activities in preparation for and consummating any public offering of its common stock or any other issuance or sale of its Capital Stock (other than Disqualified Stock);
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(8) the participation in tax, accounting and other administrative matters, including compliance with applicable laws and legal, tax and accounting matters related thereto and activities relating to its officers, directors, managers and employees;

(9) the holding of any cash and Cash Equivalents (but not operating any property);

(10) the entry into and performance of its obligations with respect to contracts and other arrangements, including the providing of indemnification to officers, managers, directors and employees; and

(11) any activities incidental to the foregoing.

(b) Parent and Holdings shall not create, incur, assume or suffer to exist any Lien on any Capital Stock of Holdings, the Issuer or any Restricted Subsidiary, as applicable, (other than Lien s pursuant to any Notes Document, Term Loan Document or ABL Document, non-consensual Lien s arising solely by operation of law and Lien s pursuant to documentation relating to other secured Indebtedness permitted to be incurred and secured hereunder and any Permitted Lien s) and shall not incur any Indebtedness (other than Guarantee s permitted above and liabilities imposed by law, including tax liabilities).

Section 4.15 Additional Note Guarantee s.

(a) If, on or after the Issue Date :

(1) any of the Issuer 's Subsidiaries Incur s or guarantee any Indebtedness under the Term Loan Credit Facility ; or

(2) any of the Issuer 's Wholly Owned Subsidiaries that is a Domestic Subsidiary Incur s or guarantees any loans or capital markets Indebtedness in excess of \$50.0 million ("Certain Other Indebtedness"),

then such Subsidiary (other than a Subsidiary Guarantor) shall become a Guarantor and execute a supplemental indenture substantially in the form of Exhibit J to hereto within 20 Business Day s of such Incur rence or guarantee.

(b) Each Person that becomes a Guarantor after the Issue Date shall also become party to the applicable Notes Security Documents pursuant to the terms of this Indenture and shall as promptly as practicable, but in any event, within 90 days of the acquisition or formation of such entity, execute and deliver such security instruments, financing statements, mortgages, deeds of trust (in substantially the same form as those executed and delivered with respect to the Collateral on the Issue Date as may be necessary to vest in the Collateral Agent a perfected first-priority security interest (subject to Permitted Lien s and priority Lien s with respect to the ABL Collateral in favor of the ABL

Collateral Agent) in properties and assets that constitute Collateral , as security for such Guarantor 's Note Guarantee and as may be necessary to have such property or asset added to the Collateral as required under the Notes Security Documents and this Indenture , and thereupon all provision of this Indenture relating to the Collateral shall be deemed to relate to such properties and assets to the same extent and with the same force and effect.

Section 4.16 Reports to Holder s.

(a) Whether or not the Issuer is subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act , so long as any Notes are outstanding hereunder, the Issuer shall furnish to the Trustee and Holder s thereof the following:

(1) all quarterly and annual financial statements of the Issuer that would be required to be filed with the Commission on Forms 10-Q and 10-K, including a "Management's Discussion and Analysis of Financial Condition and Results of Operations" that describes the financial condition and results of operations of the Issuer and its consolidated Subsidiaries and, with respect to the annual information only, a report thereon by the Issuer 's certified independent accountants; and

(2) all current reports required to be filed with the Commission on Form 8-K under Items 1.01, 1.02, 1.03, 2.01, 2.02, 2.05, 2.06, 4.01, 4.02, 5.01 and 5.02 (other than with respect to information otherwise required or contemplated by Item 402 of Regulation S-K) as in effect on the Issue Date if the Issuer were required to file such reports; *provided, however*, that no such current report will be required to include as an exhibit, or to include a summary of the terms of, any employment or compensatory arrangement agreement, plan or understanding between the Issuer (or any of its Subsidiaries) and any director, manager or executive officer, of the Issuer (or any of its Subsidiaries);

in each case, within the time periods specified in the Commission 's rules and regulations (and, during any period in which the Issuer is not required to file reports with the Commission , within the time periods specified in the Commission 's rules and regulations applicable to a "non-accelerated filer"); *provided, however*, that (i) in no event shall such reports be required to comply with Rule 3-10 of Regulation S-X promulgated by the Commission or contain separate financial statements for the Issuer , the Guarantor s or other Subsidiaries the shares of which are pledged to secure the Notes or any Guarantee that would be required under (a) Section 3-09 of Regulation S-X, (b) Section 3-10 of Regulation S-X or (c) Section 3-16 of Regulation S-X, respectively, promulgated by the Commission .

(b) The Issuer shall make all such information available to the Trustee and the Holder s, in each case, by posting such information on its website, on Intralinks or any comparable password-protected online data system which will require a confidentiality acknowledgment. In addition, the Issuer shall, for so long as any Notes remain outstanding, furnish to the Holder s of such Notes and to securities analysts and prospective investors, upon their request, the information required to be delivered pursuant to Rule 144 A (d)(4) under the Securities Act so long as the Notes are not freely transferable under the Securities Act .

(c) Notwithstanding the foregoing, Issuer may satisfy its obligations in this Section 4.16 with respect to financial information relating to the Issuer by furnishing financial information relating to any Parent Entity ; *provided* that if such Parent Entity has any material assets other than its direct or indirect Equity Interests of the Issuer , the same is accompanied by selected financial metrics, which may be unaudited, that show the differences (in the Issuer 's sole discretion) between the information relating to such Parent Entity , on the one hand, and the information relating to the Issuer and its Subsidiaries on a stand-alone basis, on the other hand.

(d) The Issuer will be deemed to have furnished the reports referred to in clauses (1) and (2) of Section 4.16(a) if the Issuer or any Parent Entity has filed reports containing such information (or any such information of a Parent Entity in accordance with the immediately preceding paragraph) with the Commission . The terms of this Indenture shall not impose any duty on the Issuer under the Sarbanes-Oxley Act of 2002 and the related Commission rules that would not otherwise be applicable to it.

(e) At any time that any of the Issuer 's Subsidiaries are Unrestricted Subsidiaries , then the quarterly and annual financial information required by clauses (1) and (2) of Section 4.16(a) will include a reasonably detailed presentation, either on the face of the financial statements or in the footnotes thereto, or in "Management's Discussion and Analysis of Financial Condition and Results of Operations," of the financial condition and results of operations of the Issuer and its Restricted Subsidiaries separate from the financial condition and results of operations of the Unrestricted Subsidiaries of the Issuer .

(f) Delivery of such reports and information to the Trustee shall be for informational purposes only, and the Trustee 's receipt of them shall not constitute constructive notice of any information contained therein or determinable from information contained therein (including the Issuer 's compliance with any of its covenants under this Indenture as to which the Trustee is entitled to rely exclusively on an Officer 's Certificate).

(g) Notwithstanding anything herein to the contrary, the Issuer will not be deemed to have failed to comply with any of its obligations under this Section 4.16 for purposes of Section 6.01(4) until 180 days after the date any report hereunder is due.

Section 4.17 Suspension of Covenants.

(a) If on any date following the Issue Date (i) the Notes have Investment Grade Rating s from both Rating Agencies , and (ii) no Default has occurred and is continuing under this Indenture (the occurrence of the events described in the foregoing clauses (i) and (ii) being collectively referred to as a "Covenant Suspension Event"), then beginning on such date, the Issuer and its Restricted Subsidiaries will not be subject to Sections 4.08 (but only to the extent related to properties or assets of the Issuer , its Restricted Subsidiaries and Holdings that do not constitute Collateral), 4.09, 4.10, 4.11, 4.12, 4.15 and 5.01(a)(3) hereof (collectively, the "Suspended Covenants").

(b) Upon the occurrence of a Covenant Suspension Event (the date of such occurrence, the "Suspension Date"), the amount of Excess Proceeds from any Asset Disposition shall be reset at zero. In the event that the Issuer and its Restricted Subsidiaries are not subject to the Suspended Covenants for any period of time as a result of the foregoing, and on any subsequent date (the "Reversion Date") one or both of the Rating Agencies withdraw their Investment Grade Rating or downgrade the rating assigned to the Notes below an Investment Grade Rating , then the Issuer and its Restricted Subsidiaries will thereafter again be subject to the Suspended Covenants with respect to future events. The period of time between (and including) the Suspension Date and the Reversion Date (but excluding the Reversion Date) is referred to in this description as the "Suspension Period."

(c) In the event of any such reinstatement, no action taken or omitted to be taken by the Issuer or any of its Restricted Subsidiaries prior to such reinstatement will give rise to a Default or Event of Default with respect to Notes . On the Reversion Date , all Indebtedness Incur red during the Suspension Period will be classified to have been Incur red pursuant to Section 4.09(b)(4). With respect to Restricted Payment s made on or after the Reversion Date , the amount of Restricted Payment s made will be calculated as though Section 4.10 had been in effect prior to, but not during, the Suspension Period . In addition, for purposes of Section 4.12, all agreements and arrangements entered into by the Issuer or any Restricted Subsidiary with an Affiliate of Holdings during the Suspension Period prior to such Reversion Date will be deemed to have been entered pursuant to Section 4.12(b)(8), and for purposes of Section 4.11, all contracts entered into during the Suspension Period prior to such Reversion Date that contain any of the restrictions contemplated by such covenant will be deemed to have been entered pursuant to clause (1)(a) of the first paragraph of Section 4.11. During any Suspension Period , the Board of Directors may not designate any of the Issuer 's Subsidiaries as Unrestricted Subsidiaries pursuant to this Indenture .

(d) In addition, notwithstanding the foregoing, the continued existence after any reinstitution of the foregoing covenants of facts and circumstances or obligations arising from transactions that occurred during the Suspension Period shall not constitute a breach of any covenant set forth in this Indenture or cause a Default or an Event of Default thereunder. Following a Reversion Date , the Issuer and its Subsidiaries will be permitted, without causing a Default or Event of Default , to honor, comply with or otherwise perform any contractual commitments or obligations arising during the Suspension Period and to consummate the transactions thereby; *provided* that such

contractual commitments or obligations were entered into during the Suspension Period and not in contemplation of a reversion of the Suspended Covenants ; *provided further* that, to the extent any such commitment or obligation results in the making of a Restricted Payment , such Restricted Payment shall be made under the Restricted Payment s Basket or under the second paragraph of Section 4.10 and, if not permitted by any such provisions, such Restricted Payment shall be deemed permitted under the Restricted Payment s Basket and shall be deducted for purposes of calculating the amount pursuant to the Restricted Payment s Basket (which may not be less than zero).

(e) Upon the Reversion Date , the obligations to grant Note Guarantee s pursuant to Section 4.15 will be reinstated (and the Reversion Date will be deemed to be the date on which any Subsidiary was acquired or created during the Suspension Period).

(f) The Issuer , in an Officer 's Certificate , shall provide the Trustee notice of any Suspension Date or Reversion Date . The Trustee will have no obligation to (i) independently determine or verify if such events have occurred, (ii) make any determination regarding the impact of actions taken during the Suspension Period on the Issuer 's future compliance with their covenants or (iii) notify the Holder s of a Suspension Date or Reversion Date . The Trustee may deliver a copy of any such Officer 's Certificate to the Holder s upon request.

ARTICLE V SUCC ESSOR COMPANY

Section 5.01 Merger, Consolidation or Sale of Assets.

(a) (i) The Issuer shall not consolidate or merge with or into any other Person or Transfer all or substantially all of the properties or assets of the Issuer and its Restricted Subsidiaries , taken as a whole, and (ii) the Issuer shall not permit any of its Restricted Subsidiaries to, in a single transaction or a series of related transactions, Transfer all or substantially all of the properties or assets of the Issuer and its Restricted Subsidiaries , taken as a whole, in each case, to, another Person unless:

(1) the Issuer shall be the continuing corporation, or the successor shall be a corporation, limited liability company or partnership organized and existing under the laws of the United States or a state thereof, the District of Columbia, or any territory thereof (the "Successor Company "), and the Successor Company expressly assumes by a supplemental indenture or amendment of the relevant documents the Issuer 's obligations under the Notes and this Indenture ;

(2) after giving effect to the transaction, no Default shall have occurred or be continuing;

(3) immediately after giving pro forma effect to such transaction, (a) Issuer or the Successor Company would be able to Incur an additional \$1.00 of Indebtedness pursuant to the first proviso in Section 4.09(a), or (b) the Consolidated Fixed Charge Coverage Ratio for the Issuer or the Successor Company would not be less than immediately prior to such transaction;

(4) each Subsidiary Guarantor, if any, shall have by supplemental indenture confirmed that its Guarantee shall apply to each such Person's Obligation under this Indenture and the Notes;

(5) to the extent any property or assets of the Successor Company are property or assets of the type that would constitute Collateral under the Notes Security Documents, the Successor Company will take such action as may be reasonably necessary or required to cause such property and assets to be made subject to a Lien securing the Notes pursuant to this Indenture and the Notes Security Documents in the manner and to the extent required by this Indenture or any of the Notes Security Documents and shall take all reasonably necessary action so that such Lien is perfected, preserved and protected to the extent required by this Indenture and the Notes Security Documents;

(6) the Collateral owned by or sold, assigned, conveyed, leased, transferred or otherwise disposed of to the Successor Company shall (a) continue to constitute Collateral under this Indenture and the Notes Security Documents, (b) be subject to the Lien in favor of the Collateral Agent for the benefit of the Trustee and the Holders and (c) not be subject to any Lien other than Permitted Liens or other Liens as permitted under Section 4.13;

(7) the Successor Company shall become a party to the Notes Security Documents; and

(8) the Issuer shall have delivered to the Trustee an Officer's Certificate and an Opinion of Counsel, each stating that such consolidation, merger or transfer and such supplemental indenture (if any) comply with this Indenture.

(b) This Section 5.01 shall not apply to any Transfer of assets (i) between or among the Issuer and any one or more of its Restricted Subsidiaries that are Guarantors, (ii) between or among any one or more of the Issuer's Restricted Subsidiaries that are Guarantors or (iii) between or among any one or more of the Issuer's Restricted Subsidiaries that are not Guarantors. Clause (2) of Section 5.01(a) (and the requirement to deliver an Officer's Certificate and an Opinion of Counsel) shall not apply to (1) any merger or consolidation of the Issuer with or into, or Transfer of all of the properties or assets of the Issuer and its Restricted Subsidiaries, taken as a whole, to one of its Restricted Subsidiaries that is a Guarantor for any purpose or (2) any merger or consolidation of the

Issuer or a Restricted Subsidiary solely for the purpose of reincorporating the Issuer or a Restricted Subsidiary into another state of the United States, the District of Columbia or any territory of the United States.

Section 5.02 Successor Person Substituted.

Upon any consolidation, combination or merger of the Issuer , or any Transfer of all or substantially all of the assets of the Issuer and its Restricted Subsidiaries , taken as a whole, in accordance with the foregoing provisions of Section 5.01, in which the Issuer is not the continuing obligor under the Notes , the surviving entity formed by such consolidation or into which the Issuer is merged or to which such Transfer of all or substantially all of the assets of the Issuer and its Restricted Subsidiaries , taken as a whole, is made will succeed to, and be substituted for, and may exercise every right and power of the Issuer under this Indenture , the Notes and the Notes Security Documents with the same effect as if such surviving entity had been named therein as the Issuer and, the Issuer and all of the Guarantor s will be released from the obligation to pay the principal of and interest on such Notes or in respect of its related Note Guarantee , as the case may be, and all of the Issuer 's or such Guarantor 's other obligations and covenants under such Notes , this Indenture and its related Note Guarantee , if applicable.

ARTICLE VI
DEFAULTS AND REMEDIES

Section 6.01 Events of Default.

Each of the following constitutes an "Event of Default" with respect to the Notes :

- (1) default for 30 consecutive days in the payment when due of interest with respect to the Notes ;
 - (2) default in payment when due of principal or premium, if any, on the Notes on the Maturity Date , upon redemption or otherwise;
 - (3) failure by the Issuer or any Restricted Subsidiary after receipt of notice from the Trustee or Holder s of at least 25% in aggregate principal amount of the Notes then outstanding under this Indenture (with a copy to the Trustee) to comply with any of the provisions under Section 4.07;
 - (4) failure by the Issuer or any Restricted Subsidiary of the Issuer for 60 consecutive days after receipt of notice from the Trustee or the Holder s of at least 25% in aggregate principal amount of the Notes then outstanding under this Indenture (with a copy to the Trustee) to comply with any covenant or agreement contained in this Indenture (other than the covenants and agreements specified in clauses (1) through (3) of this Section 6.01);
 - (5) default under any mortgage, indenture or instrument under which there may be issued or by which there may be secured or evidenced any Indebtedness for money borrowed of the Issuer or any of its Restricted Subsidiaries or the payment of which is guaranteed by the Issuer or any of its Restricted Subsidiaries (other than Indebtedness owed to the Issuer or a Restricted Subsidiary), whether such Indebtedness or Guarantee now exists or is created after the Issue Date , which default (a) is caused by a failure to pay when due at final Stated Maturity (giving effect to any grace period related thereto) principal of such Indebtedness (a "Payment Default ") or (b) results in the acceleration of such Indebtedness prior to its Stated Maturity , and, in each case, the principal amount of any such Indebtedness , together with the principal amount of any such Indebtedness under which there has been a Payment Default or the maturity of which has been so accelerated, aggregates \$35.0 million or more; and, in each case, the Issuer has received notice specifying the default from the Trustee or Holder s of at least 25% in aggregate principal amount of Notes then outstanding (with a copy to the Trustee) and does not cure the default within 30 days;
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(6) failure by the Issuer or any Restricted Subsidiary that is a Significant Subsidiary or group of Subsidiaries of the Issuer that, together, would constitute a Significant Subsidiary to pay final and non-appealable judgments (net of any amounts covered by insurance and as to which such insurer has not denied responsibility or coverage in writing) aggregating \$35.0 million or more, which judgments are not paid, discharged, bonded, stayed or waived within 60 days after such judgment becomes final, and in the event such judgment is covered in full by insurance, an enforcement proceeding has been commenced by any creditor upon such judgment or decree which is not promptly stayed;

(7) (A) a court of competent jurisdiction enters an order or decree under any Bankruptcy Law that (i) is for relief against the Issuer or any Restricted Subsidiary that is a Significant Subsidiary or group of Restricted Subsidiaries of the Issuer that, taken together, would constitute a Significant Subsidiary in an involuntary case or proceeding in which the Issuer, a Guarantor or any Restricted Subsidiary that is a Significant Subsidiary or group of Restricted Subsidiaries of the Issuer that, taken together, would constitute a Significant Subsidiary is to be adjudicated bankrupt or insolvent, (ii) appoints a custodian, receiver, liquidator, assignee, trustee, sequestrator or other similar official of the Issuer, a Guarantor or any Restricted Subsidiary that is a Significant Subsidiary or group of Restricted Subsidiaries of the Issuer that, taken together, would constitute a Significant Subsidiary, or for all or substantially all of the property of the Issuer, a Guarantor or any Restricted Subsidiary that is a Significant Subsidiary or group of Subsidiaries of the Issuer that, taken together, would constitute a Significant Subsidiary, or (iii) orders the winding up or liquidation of the Issuer, a Guarantor or any Restricted Subsidiary that is a Significant Subsidiary or group of Restricted Subsidiaries of the Issuer that, taken together, would constitute a Significant Subsidiary, and in each of clauses (A)(i), (A)(ii) and (A)(iii), such order or decree remains unstayed and in effect for a period of 60 consecutive days; or (B) the Issuer, a Guarantor or any Restricted Subsidiary that is a Significant Subsidiary or group of Restricted Subsidiaries of the Issuer that, taken together, would constitute a Significant Subsidiary pursuant to or within the meaning of any Bankruptcy Law (i) commences a voluntary case to be adjudicated bankrupt or insolvent or consents to the entry of an order for relief against it in an involuntary case, (ii) consents to the appointment of or taking possession by a receiver, liquidator, assignee, custodian, trustee, sequestrator or similar official of the Issuer, such Guarantor or any such Restricted Subsidiary or group of Restricted Subsidiaries or for all or substantially all of its property, (iii) effects any general assignment for the benefit of its creditors or (iv) generally is not paying its debts as they become due;

(8) any Note Guarantee of any Guarantor that is a Significant Subsidiary (or any group of Subsidiaries that together would constitute a Significant Subsidiary) ceases to be in full force and effect in all material respects (other than in accordance with the terms of such Note Guarantee and this Indenture) or is declared null and void and unenforceable or found to be invalid or any such Guarantor denies its liability under its Note Guarantee (other than by reason of the satisfaction and discharge of this Indenture or the release of such Guarantor from

its Note Guarantee in accordance with the terms of this Indenture and such Note Guarantee); and

(9) other than by reason of the satisfaction in full of all obligations under this Indenture and discharge of this Indenture with respect to the Notes or the release of such Collateral with respect to the Notes in accordance with the terms of this Indenture and the Notes Security Documents ,

(a) in the case of any security interest with respect to a material portion of the Collateral , such security interest under the Notes Security Documents shall, at any time, cease to be a valid and perfected security interest or shall be declared invalid or unenforceable, default by the Issuer or any Guarantor in the performance of the Notes Security Documents that adversely affects in any material respect the enforceability, validity, perfection or priority of such Lien s on a material portion of the Collateral , or the determination in a judicial proceeding that the Notes Security Documents are unenforceable or invalid against the Issuer or any Guarantor party thereto for any reason with respect to a material portion of the Collateral , and any such default continues for 30 days after notice of such default shall have been given to the Issuer by the Trustee or the Holder s of at least 25% of the principal amount of the then outstanding Notes issued under this Indenture , except to the extent that any such default (A) results from the failure of the Collateral Agent to maintain possession of certificates, promissory notes or other instruments actually delivered to it representing securities pledged under the Notes Security Documents or (B) to the extent relating to Collateral consisting of real property, is covered by a title insurance policy with respect to such real property and such insurer has not denied or failed to acknowledge coverage; or

(b) the Issuer or any Guarantor shall assert in writing that any security interest under any Notes Security Document is invalid or unenforceable.

Section 6.02 Acceleration of Maturity; Rescission.

If any Event of Default under this Indenture occurs and is continuing, either the Trustee or the Holder s of at least 25% in aggregate principal amount of the Notes then outstanding, may declare the principal of, premium, if any, and accrued but unpaid interest, on all of the outstanding Notes to be due and payable by notice in writing to the Issuer and the Trustee , in the case of notice by Holder s, specifying the respective Event of Default and that it is a "notice of acceleration" and the same shall become immediately due and payable. Notwithstanding the foregoing, in the case of an Event of Default arising under Section 6.01(7) with respect to the Issuer , the principal of, premium, if any, and accrued but unpaid interest, on all of the outstanding Notes shall become due and payable without further action or notice.

If the Notes are accelerated or otherwise become due prior to the Maturity Date, in each case, as a result of an Event of Default (including, but not limited to, an Event of Default specified in Section 6.01(7) (including the acceleration of any claims by operation of law)), the amount that shall then be due and payable in respect of the Notes shall equal the amount which would be due on an optional redemption of the Notes, in each case, determined as of the date of such acceleration, as if the Notes had been optionally redeemed as of the date of such acceleration (i.e., principal plus the Make-Whole Premium if prior to June 1, 2022, and thereafter principal at the redemption price specified under paragraph 5 of the Notes as of such date) and, in each case, accrued and unpaid interest to, but excluding, the date of redemption of such Notes (or payment in the case of a bankruptcy or insolvency event). The amount in excess of par represented by such redemption price, the "Redemption Premium," and, together with any Make-Whole Premium, the "premium".

Without limiting the generality of the foregoing, it is understood and agreed that if the Notes are accelerated or otherwise become due prior to the Maturity Date, in each case, as a result of an Event of Default (including, but not limited to, an Event of Default specified in Section 6.01(7) (including the acceleration of any claims by operation of law)), the Make-Whole Premium or the Redemption Premium, as applicable, shall also be due and payable as though the Notes had been optionally redeemed on the date of such acceleration and shall constitute part of the Obligations with respect to the Notes in view of the impracticability and extreme difficulty of ascertaining actual damages and by mutual agreement of the parties as to a reasonable calculation of each Holder's lost profits as a result thereof. If the Make-Whole Premium or the Redemption Price Premium, as applicable, becomes due and payable, it shall be deemed to be principal of the Notes and interest shall accrue on the full principal amount of the Notes (including the Make-Whole Premium or the Redemption Price Premium, as applicable) from and after the applicable triggering event, including in connection with an Event of Default specified in Section 6.01(7). Any premium payable pursuant to this paragraph and the immediately preceding paragraph shall be presumed to be equal to the liquidated damages sustained by each Holder as the result of the early acceleration or redemption of the Notes and the Issuer and each Guarantor agrees that it is a reasonable estimate under the circumstances currently existing of such Holder's actual damages. The premium shall also be payable in the event the Notes and/or this Indenture are satisfied, released or discharged through foreclosure, whether by power of judicial proceeding, deed in lieu of foreclosure or by any other means and/or upon the satisfaction, release, payment, restructuring, reorganization, replacement, reinstatement or compromise of the Notes in any insolvency or liquidation proceeding. THE ISSUER AND EACH GUARANTOR EXPRESSLY WAIVES (TO THE FULLEST EXTENT THEY MAY LAWFULLY DO SO) THE PROVISIONS OF ANY PRESENT OR FUTURE STATUTE OR LAW, RULE OR REGULATION THAT PROHIBITS OR MAY PROHIBIT THE COLLECTION OF THE FOREGOING PREMIUM IN CONNECTION WITH ANY SUCH ACCELERATION. The Issuer and each Guarantor expressly agrees (to the fullest extent they may lawfully do so) that: (A) the premium is reasonable and is the product of an arm's length transaction between sophisticated business entities ably represented by counsel; (B) the premium shall be payable notwithstanding the then prevailing market rates at the time of any acceleration or such payment is made; (C) there has been a course of conduct between the Holders, on the one hand, and the Issuer and the Guarantors, on the other hand, giving specific consideration in this transaction for such agreement to pay the premium; and (D) the

Issuer and each Guarantor shall be estopped hereafter from claiming differently than as agreed to in this paragraph. The Issuer and each Guarantor expressly acknowledges that its agreement to pay the premium to the Holder s as herein described is a material inducement to the Holder s to purchase the Notes .

In the event of any Event of Default specified in Section 6.01(5), such Event of Default and all consequences thereof (excluding any resulting Payment Default , other than as a result of acceleration of the Notes) shall be annulled, waived and rescinded, automatically and without any action by the Trustee or the Holder s, if within 30 days after such Event of Default arose:

- (1) the Indebtedness or Guarantee that is the basis for such Event of Default has been discharged; or
 - (2) Holder s thereof have rescinded or waived the acceleration, notice or action (as the case may be) giving rise to such Event of Default ;
- or
- (3) the Payment Default that is the basis for such Event of Default has been cured.

In the event of a declaration of acceleration with respect to the Notes , the Holder s of a majority in aggregate principal amount of the then outstanding Notes may, by written notice to the Issuer and the Trustee , on behalf of all of the Holder s, rescind and annul such acceleration and its consequences, so long as such rescission and annulment would not conflict with any judgment of a court of competent jurisdiction if:

- (1) all Events of Default , other than nonpayment of principal, premium, if any, or interest that has become due solely because of the acceleration, have been cured or waived;
 - (2) to the extent the payment of such interest is lawful, interest on overdue installments of interest and overdue principal, which has become due otherwise than by such declaration of acceleration, has been paid; and
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(3) the Issuer has paid the Trustee its reasonable compensation and reimbursed the Trustee for its reasonable expenses, disbursements, indemnities and advances.

No such rescission shall affect any subsequent Default or impair any right consequent thereto.

Section 6.03 Other Remedies.

If an Event of Default occurs and is continuing, the Trustee may pursue any available remedy by proceeding at law or in equity to collect the payment of principal of, or premium, if any, and interest on the Notes or to enforce the performance of any provision of the Notes or this Indenture and may take any necessary action requested by the Holder s of a majority of the principal amount outstanding of the Notes to settle, compromise, adjust or otherwise conclude any proceedings to which it is a party.

The Trustee may maintain a proceeding even if it does not possess any of the Notes or does not produce any of them in the proceeding. A delay or omission by the Trustee or any Noteholder in exercising any right or remedy accruing upon an Event of Default shall not impair the right or remedy or constitute a waiver of or acquiescence in the Event of Default . Except as otherwise provided with respect to the replacement or payment of mutilated, destroyed, lost or stolen Notes in Section 2.08, no remedy herein conferred upon or reserved to the Trustee or to the Holder s is exclusive of any other remedy. All available remedies are cumulative to the extent permitted by law.

Section 6.04 Waiver of Existing Default s and Events of Default .

(a) Subject to Sections 2.10 and 6.08 and the terms of the Notes Security Documents , the Holder s of a majority in principal amount of the Notes then outstanding shall have the right to waive any past and existing Default or Event of Default and its consequences under this Indenture , *except* a Default in the payment of the principal of, or interest or premium, if any, on any Note held by a non-consenting Holder as specified in clauses (1) and (2) of Section 6.01 or in respect of a covenant or a provision which cannot be modified or amended without the consent of each Holder as provided for in Section 8.02 (which shall require the consent of all Holder s); *provided* that, subject to Section 6.02, the Holder s of a majority in aggregate principal amount of the then outstanding Notes may rescind an acceleration and its consequences, including any related payment default that resulted from such acceleration. In case of any such waiver, the Issuer , the Trustee and the Holder s shall be restored to their former positions and rights hereunder and under the Notes , respectively.

(b) Upon any such waiver, such Default shall cease to exist, and any Event of Default arising therefrom shall be deemed to have been cured for every purpose of this Indenture , but no such waiver shall extend to any subsequent or other Default or Event of Default or impair any right consequent thereto.

Section 6.05 Control by Majority.

Subject to Sections 2.10, 6.06 and 7.01 of this Indenture and the Intercreditor Agreements, the Holders of a majority in aggregate principal amount of the outstanding Notes have the right to direct the time, method and place of conducting any proceeding for exercising any remedy available to the Trustee or the Collateral Agent or exercising any trust or power conferred on the Trustee or the Collateral Agent by this Indenture or the Notes Security Documents. The Trustee or the Collateral Agent, however, may refuse to follow any direction that conflicts with law or this Indenture or the Notes Security Documents or that the Trustee or the Collateral Agent determines may be unduly prejudicial to the rights of another Holder not taking part in such direction, and the Trustee or the Collateral Agent shall have the right to decline to follow any such direction (it being understood that the Trustee or the Collateral Agent does not have an affirmative duty to ascertain whether or not any such directions are unduly prejudicial to such Holders) if the Trustee or the Collateral Agent, being advised by counsel, determines that the action so directed may not lawfully be taken or if the Trustee or the Collateral Agent in good faith shall, by a Responsible Officer, determine that the proceedings so directed may involve it in personal liability; *provided* that the Trustee or the Collateral Agent may take any other action deemed proper by the Trustee or the Collateral Agent which is not inconsistent with such direction. In the event the Trustee or the Collateral Agent takes any action or follows any direction pursuant to this Indenture or the Notes Security Documents, the Trustee or the Collateral Agent shall be entitled to indemnification reasonably satisfactory to it against any cost, liability or expense that might be caused by taking such action or following such direction.

Without such direction and indemnification as described above, neither the Trustee nor the Collateral Agent will be obligated to act upon directions purported to be delivered to it such Holders of a majority in aggregate principal amount of the outstanding Notes, to foreclose upon or otherwise enforce any Lien or to take any other action whatsoever with regard to any or all of the Notes Security Documents, the Liens created thereby or the Collateral.

Section 6.06 Limitation on Suits.

Subject to Section 6.08, no Holder shall have any right to institute any proceeding with respect to this Indenture, the Notes Security Documents or the Notes or for any remedy hereunder or thereunder, unless:

- (1) such Holder has previously given the Trustee or the Collateral Agent written notice of a continuing Event of Default;
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- (2) the Holder s of at least 25% in principal amount of the Notes then outstanding have made a written request to the Trustee or the Collateral Agent to pursue the remedy;
- (3) such Holder or Holder s have offered the Trustee or Collateral Agent security or indemnity satisfactory to the Trustee or the Collateral Agent against any costs, liability or expense;
- (4) the Trustee or the Collateral Agent has not complied with the request within 60 days after receipt of the request and the offer of security or indemnity against any cost, liability or expense that might be caused by complying with such request; and
- (5) during such 60-day period, the Holder s of a majority in aggregate principal amount of the outstanding Notes have not given the Trustee or the Collateral Agent a direction that is inconsistent with the request.

A Noteholder may not use any provision of this Indenture to disturb or prejudice the rights of another Noteholder or to obtain a preference or priority over another Noteholder .

Section 6.07 No Person al Liability of Directors, Officer s, Employees and Stockholders.

No past, present or future director, officer, employee, manager, member, partner, incorporator or stockholder of the Issuer or of any Restricted Subsidiary of the Issuer or any Parent Entity of the Issuer (other than the Issuer in respect of the Notes and each Guarantor in respect of its Guarantee), as such, shall have any liability for any obligations of the Issuer or the Guarantor s under the Notes , this Indenture , the Note Guarantee s, the Notes Security Documents , the Intercreditor Agreements or for any claim based on, in respect of, or by reason of, such obligations or their creation. Each Holder by accepting a Note waives and releases all such liability. The waiver may not be effective to waive liabilities under the federal securities laws.

Section 6.08 Rights of Holder s To Receive Payment.

Notwithstanding any other provision of this Indenture , the contractual right of any Holder to bring suit to enforce the payment, of principal, premium, if any, and interest, if any, on its Note on or after the respective due dates expressed or provided for in such Note shall not be amended without the consent of such Holder .

Section 6.09 Collection Suit by Trustee.

If an Event of Default specified in Section 6.01(1) or (2) occurs and is continuing, the Trustee may recover judgment in its own name and as trustee of an express trust against the Issuer or any Guarantor (or any other obligor on the Notes) for the whole amount of unpaid principal and accrued interest remaining unpaid, together with interest on overdue principal and, to the extent that payment of such interest is lawful, interest on overdue installments of interest, in each case, at the rate

set forth in the Notes , and such further amounts as shall be sufficient to cover the costs and expenses of collection, including the reasonable compensation, expenses, disbursements and advances of the Trustee , its agents and counsel.

Section 6.10 Trustee May File Proofs of Claim.

The Trustee may file such proofs of claim and other papers or documents as may be necessary or advisable in order to have the claims of the Trustee (including any claim for the reasonable compensation, expenses, disbursements and advances of the Trustee , its agents and counsel, and any other amounts due the Trustee under Section 7.07) and the Noteholder s allowed in any judicial proceedings relative to the Issuer or any Guarantor (or any other obligor upon the Notes), its creditors or its property and shall be entitled and empowered to collect and receive any monies or other property payable or deliverable on any such claims and to distribute the same after deduction of its charges and expenses to the extent that any such charges and expenses are not paid out of the estate in any such proceedings and any custodian in any such judicial proceeding is hereby authorized by each Noteholder to make such payments to the Trustee , and in the event that the Trustee shall consent to the making of such payments directly to the Noteholder s, to pay to the Trustee any amount due to it for the reasonable compensation, expenses, disbursements and advances of the Trustee , its agents and counsel, and any other amounts due the Trustee under Section 7.07.

Nothing herein contained shall be deemed to authorize the Trustee to authorize or consent to or accept or adopt on behalf of any Noteholder any plan or reorganization, arrangement, adjustment or composition affecting the Notes or the rights of any Noteholder thereof, or to authorize the Trustee to vote in respect of the claim of any Noteholder in any such proceedings.

Section 6.11 Priorities.

If the Trustee collects any money or property pursuant to this Article VI, subject to the terms of the Intercreditor Agreements , such money or property shall be paid out or distributed in the following order:

FIRST: to the Trustee , the Collateral Agent and any predecessor Trustee or Collateral Agent for amounts due under Section 7.07;

SECOND: to Noteholder s for amounts due and unpaid on the Notes for principal, premium, if any, and interest, ratably, without preference or priority of any kind, according to the amounts due and payable on the Notes for principal, premium, if any, and interest, respectively; and

THIRD: to the Issuer or, to the extent the Trustee collects any amount from any Guarantor , to such Guarantor or as a court of competent jurisdiction may direct in writing.

The Trustee may fix a record date and payment date for any payment to Noteholder s pursuant to this Section 6.11.

Section 6.12 Undertaking for Costs.

In any suit for the enforcement of any right or remedy under this Indenture or in any suit against the Trustee for any action taken or omitted by it as Trustee , a court in its discretion may require the filing by any party litigant in the suit of an undertaking to pay the costs of the suit, and the court in its discretion may assess reasonable costs, including reasonable attorneys' fees and expenses, against any party litigant in the suit, having due regard to the merits and good faith of the claims or defenses made by the party litigant. This Section 6.12 does not apply to a suit by the Trustee , a suit by a Noteholder pursuant to Section 6.08 or a suit by Noteholder s of more than 10% in principal amount of the Notes then outstanding.

ARTICLE VII
TRUSTEE AND COLLATERAL AGENT

Section 7.01 Duties of Trustee and Collateral Agent .

(a) Subject to the terms and protections of this Indenture and the Notes Security Documents for the benefit of the Trustee and the Collateral Agent , (including but not limited as to the provision of indemnity or security) if a Default or Event of Default actually known to a Responsible Officer of the Trustee has occurred and is continuing, subject to the protections of this Article VII (including, but not limited to, the provision of reasonable indemnity) the Trustee or the Collateral Agent shall exercise such of the rights and powers vested in it by this Indenture and use the same degree of care and skill in their exercise as a prudent person under the circumstances would exercise or use under the same circumstances in the conduct of his or her own affairs.

Except for an Event of Default pursuant to Section 6.01(1) or 6.01(2) (upon the occurrence of which the Trustee if then acting as Paying Agent will be deemed to have knowledge thereof), the Trustee shall not be deemed to have notice or be charged with knowledge of any Default or Event of Default unless a Responsible Officer of the Trustee has received written notice of any event which is in fact such a Default or Event of Default by the Issuer or by the Holder s of at least 25% of the aggregate principal amount of the Notes by written notice of such event sent to the

Trustee in accordance with Section 12.02 at the Corporate Trust Office of the Trustee , and such notice references the Notes and this Indenture .

(b) The Trustee , except during the continuance of a Default or Event of Default of which a Responsible Officer of the Trustee has actual knowledge and subject to clause (a) above, and, at all times, the Collateral Agent :

(1) need perform only those duties that are specifically set forth in this Indenture and the Notes Security Documents and no others, and no implied covenants or obligations shall be read into this Indenture or the Notes Security Documents against the Trustee and the Collateral Agent ; and

(2) in the absence of gross negligence or bad faith on its part, may conclusively rely, as to the truth of the statements and the correctness of the opinions expressed therein, upon certificates or opinions furnished to the Trustee and the Collateral Agent under this Indenture and/or the Notes Security Documents and conforming to the requirements of this Indenture and the Notes Security Documents but, in the case of any such certificates or opinions which by any provision hereof are specifically required to be furnished to the Trustee or the Collateral Agent , as applicable, the Trustee or the Collateral Agent , as applicable, shall be under a duty to examine the same to determine whether or not they conform on their face to the requirements of this Indenture and the Notes Security Documents as the case may be (but need not confirm or investigate the accuracy of mathematical calculations or other facts stated therein). Whenever in the administration of this Indenture the Trustee or the Collateral Agent shall deem it desirable that a matter be proved or established prior to taking, suffering or omitting any action hereunder, the Trustee or the Collateral Agent , as applicable (unless other evidence be herein specifically prescribed), may require and, in the absence of bad faith on its part, conclusively rely upon an Officer 's Certificate and/or an Opinion of Counsel (if this Indenture permits or provides for such Opinion of Counsel), subject to the requirement in the preceding sentence, if applicable.

(c) Neither the Trustee nor the Collateral Agent may be relieved from liability for its own negligent action, its own negligent failure to act, or its own willful misconduct, except that:

(1) This paragraph does not limit the effect of subsection (b) of this Section 7.01.

(2) Neither the Trustee nor the Collateral Agent shall be liable for any error of judgment made in good faith by a Responsible Officer , unless it is proved that the Trustee or the Collateral Agent was negligent in ascertaining the pertinent facts.

(3) Neither the Trustee nor the Collateral Agent shall be liable with respect to any action it takes or omits to take in good faith in accordance with a direction received by it from a majority in aggregate principal amount of the Notes outstanding pursuant to the terms of this Indenture .

(d) Whether or not therein expressly so provided, Section 7.01 and Section 7.02 shall govern every provision of this Indenture that in any way relates to the Trustee or the Collateral Agent , as applicable.

(e) The Trustee and the Collateral Agent will be under no obligation to exercise any of its rights and powers under this Indenture or the Notes Security Documents unless the Trustee has been offered security or indemnity reasonably satisfactory to it against any expenses, loss, liability or exposure. The Trustee 's fees, expenses and indemnities (including, but in no way limited to, the fees and disbursements of agents and attorneys) are included in the amounts guaranteed by the Note Guarantee s.

(f) Neither the Trustee nor the Collateral Agent shall be liable for interest on any money received by it except as the Trustee or the Collateral Agent , as applicable, may agree in writing with the Issuer or any Guarantor . Money held in trust by the Trustee or the Collateral Agent need not be segregated from other funds except to the extent required by the law.

(g) No provision of this Indenture or the Notes Security Documents shall require the Trustee or the Collateral Agent to expend or risk its own funds or otherwise incur any financial liability in the performance of any of its rights, powers or duties. Neither the Trustee nor the Collateral Agent shall be required to give any bond or surety in respect of the performance of its powers or duties hereunder.

(h) The Collateral Agent and the Trustee shall have no duty or obligation to (x) make any filings, including but not limited to any UCC -1 or UCC continuation filings, (y) ensure a perfected lien with the requisite priority is granted over the applicable Collateral , including any after acquired Collateral , or (z) ensure that any documentation delivered from time to time to grant, preserve, protect and perfect the validity and priority of the security interests and Lien s (including but not limited to any real estate documentation) is in customary and/or legally satisfactory form to accomplish the applicable documents' intended purpose.

(i) For the avoidance of doubt, the Collateral Agent and the Trustee shall have no obligation to enter into any such documentation to the extent the Collateral Agent or the Trustee shall determine, in its sole discretion, among other matters, such documentation (i) is prohibited by applicable law, (ii) will violate the terms of any intercreditor agreement to which the Collateral Agent

or the Trustee is party, (iii) to the extent relating to any foreign Collateral will have the result of requiring the Collateral Agent or the Trustee to register with, make filings and/or disclosures to any foreign governmental authority or otherwise result in additional burdens to the Collateral Agent vis a vis such foreign jurisdiction or (iv) such documentation imposes additional fees, costs, expenses or potential liabilities on the Collateral Agent or the Trustee without appropriate indemnification therefor being provided by the applicable Holder s.

Section 7.02 Rights of Trustee and Collateral Agent .

Subject to Section 7.01:

- (1) The Trustee and the Collateral Agent may conclusively rely on any document (whether in its original, facsimile or electronic (including .pdf) form) reasonably believed by it to be genuine and to have been signed or presented by the proper person. The Trustee and the Collateral Agent need not investigate any fact or matter stated in the document.
 - (2) Before the Trustee or the Collateral Agent acts or refrains from acting, it may require and shall be entitled to receive an Officer 's Certificate or an Opinion of Counsel , or both, which shall conform to the provisions of Section 12.05. The Trustee and the Collateral Agent shall be protected and shall not be liable for any action it takes or omits to take in good faith in reliance on such certificate or opinion.
 - (3) Each of the Trustee and the Collateral Agent may act through its attorneys and agents and shall not be responsible for the misconduct or negligence of any attorney or agent appointed by it with due care.
 - (4) Neither the Trustee nor the Collateral Agent shall be liable for any action it takes or omits to take in good faith which it reasonably believes to be authorized or within its rights or powers; *provided* that the Trustee 's or the Collateral Agent 's conduct does not constitute negligence or willful misconduct.
 - (5) Each of the Trustee and the Collateral Agent may consult with counsel of its selection, and the advice or opinion of such counsel as to matters of law shall be full and complete authorization and protection from liability in respect of any action taken, omitted or suffered by it hereunder in good faith and in accordance with the advice or opinion of such counsel.
 - (6) Notwithstanding any of the other provisions of this Indenture , the rights, privileges, protections, immunities and benefits given to the Trustee and/or the Collateral Agent , including, without limitation, its right to be compensated, reimbursed and indemnified, are extended to, and shall be enforceable by, the Trustee and the Collateral Agent in each of its capacities hereunder (including but not limited to as Registrar , Paying Agent and Depository Custodian), and each agent, custodian and other person employed to act hereunder.
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(7) The right of the Trustee or the Collateral Agent to perform any discretionary act enumerated in this Indenture or the Notes Security Documents shall not be construed as a duty, and the Trustee and the Collateral Agent shall not be answerable for other than its own negligence or willful misconduct in the performance of such act.

(8) The Trustee and the Collateral Agent may from time to time request that the Issuer deliver an Officer's Certificate setting forth the names of individuals and/or titles of officers authorized at such time to take specified actions pursuant to this Indenture and the Notes Security Documents, which Officer's Certificate may be signed by any persons authorized to sign an Officer's Certificate, including any person specified as so authorized in any such certificate previously delivered and not superseded.

(9) In no event shall the Trustee or the Collateral Agent be responsible or liable for special, indirect, punitive or consequential loss or damage of any kind whatsoever (including, but not limited to, loss of profit) irrespective of whether the Trustee or the Collateral Agent has been advised of the likelihood of such loss or damage and regardless of the form of action.

(10) The Trustee and the Collateral Agent will not be bound to make any investigation into the facts or matters stated in any resolution, certificate, statement, instrument, opinion, report, notice, request, direction, consent, order, bond, debenture, note, other evidence of indebtedness, or other paper or document, or inquire as to the performance by the Issuer or the Guarantors of any of their covenants in this Indenture or any of the Notes Security Documents but the Trustee or the Collateral Agent, in its discretion, may make such further inquiry or investigation into such facts or matters as it may see fit.

(11) Any request or direction of the Issuer mentioned herein shall be sufficiently evidenced by an Issuer Order or an Officer's Certificate, as applicable.

Section 7.03 Individual Rights of Trustee.

The Trustee in its individual or any other capacity may become the owner or pledgee of Notes and may make loans to, accept deposits from, perform services for or otherwise deal with either the Issuer or any Guarantor, or any Affiliate thereof, with the same rights it would have if it were not Trustee. However, in the event that the Trustee acquires any conflicting interest within the meaning of Section 310(b) of the TIA, it must eliminate such conflict within 90 days, apply to the Commission for permission to continue as Trustee or resign. Any Agent may do the same with like rights. The Trustee shall also be subject to Sections 7.10 and 7.11.

Section 7.04 Disclaimer.

The recitals contained herein and in the Notes , except for the Trustee 's certificate of authentication, shall be taken as the statements of the Issuer or the Guarantor s, as the case may be, and neither the Trustee nor the Collateral Agent assumes responsibility for their correctness. The Trustee and the Collateral Agent shall not be responsible for and makes no representation as to the validity or adequacy of this Indenture , the Notes , any Note Guarantee or the Notes Security Documents , they shall not be accountable for the Issuer 's or any Guarantor 's use of the proceeds from the sale of Notes , they will not be responsible for the use or application of any money received by any Paying Agent (other than itself as Paying Agent) or any money paid to the Issuer or any Guarantor pursuant to the terms of this Indenture and they shall not be responsible for any statement in the Notes , the Note Guarantee s, this Indenture or the Notes Security Documents other than the Trustee 's certificate of authentication. Neither the Trustee nor the Collateral Agent shall be responsible for any statement in the Offer ing Memorandum or any other document utilized by the Issuer in connection with the sale of the Notes , and shall not be responsible for any rating on the Notes or any action or omission of any Rating Agency.

Section 7.05 Notice of Default s.

If a Default or Event of Default occurs and is continuing (which shall not be cured or waived) and if it is known to the Trustee (pursuant to Section 7.01(a) hereof), the Trustee shall give to each Holder a notice of the Default or Event of Default within 90 days of having received such notice as provided in this Indenture . Except in the case of a Default or Event of Default relating to the payment of the principal, premium, if any, or interest on any Note (including payments pursuant to a redemption or repurchase of the Notes pursuant to the provisions of this Indenture), the Trustee may withhold the notice if and so long as the board of directors, the executive committee or a trust committee of directors or Responsible Officer s of the Trustee in good faith determines that withholding the notice is in the interests of Holder s.

Section 7.06 [Reserved].Section 7.07 Compensation and Indemnity.

The Issuer and the Guarantor s shall pay to the Trustee and the Collateral Agent from time to time compensation as agreed upon for its services hereunder (which compensation shall not be limited by any provision of law in regard to the compensation of a trustee of an express trust). The Issuer and the Guarantor s shall reimburse the Trustee and the Collateral Agent upon request for all reasonable disbursements, expenses and advances incurred or made by it in connection with the Trustee 's and the Collateral Agent 's duties under this Indenture , the Notes Guarantee s, the Notes Security Documents and/or any other related documents including the reasonable compensation, disbursements and expenses of the Trustee 's and the Collateral Agent 's agents and counsel.

The Issuer and the Guarantor s, jointly and severally, shall indemnify each of the Trustee and the Collateral Agent and its respective agents, employees, stockholders, attorneys, directors and officers and any predecessor Trustee or Collateral Agent for, and hold each of them harmless against, any and all loss, damage, claim, liability or expense, including without limitation taxes (other than taxes based on the income of any such Person) and reasonable attorneys' fees and expenses (collectively, "Losses") incurred by each of them in connection with the acceptance or administration of this Indenture , the Notes Guarantee s, the Notes Security Documents and/or any other related documents or the performance of their respective duties under this Indenture , the Notes , the Notes Guarantee s, the Notes Security Documents and/or any other related documents or the exercise of the respective rights and powers under this Indenture , the Notes , the Note Guarantee s, the Notes Security Documents and/or any other related documents, including the reasonable costs and expenses of enforcing this Indenture (including this Section 7.07), the Notes , the Note Guarantee s, the Notes Security Documents , or any related documents or otherwise arising under such documents and including the reasonable costs and expenses of defending itself against any claim (whether asserted by any Holder , the Issuer , any Guarantor or otherwise) or liability in connection with the exercise or performance of any of its rights, powers or duties hereunder (including, without limitation, settlement costs). The Trustee or the Collateral Agent , as applicable, shall notify the Issuer and the Guarantor s in writing promptly of any third party claim of which a Responsible Officer of the Trustee or the Collateral Agent , as applicable has actual knowledge asserted against the Trustee or the Collateral Agent , as applicable, for which it may seek indemnity (each, a "Third Party Claim"); *provided* that the failure by the Trustee or the Collateral Agent , as applicable to so notify the Issuer and the Guarantor s shall not relieve the Issuer and Guarantor s of their obligations hereunder except to the extent the Issuer and the Guarantor s are actually prejudiced thereby. Neither the Issuer nor any Guarantor need pay for any settlement or provide any indemnification for any other Losses associated therewith to the extent such settlement is made in connection with any Third Party Claim without its consent, which consent shall not be unreasonably withheld or delayed. The Trustee and the Collateral Agent shall have the right to its own counsel and the Issuer shall pay the reasonable fees and expenses of such counsel in connection with any Third Party Claim to the extent the Trustee or the Collateral Agent , as applicable, reasonably determines that a conflict of interest exists or is required in connection with the performance of its duties under this Indenture .

Notwithstanding the foregoing, the Issuer and the Guarantor s need not reimburse the Trustee or the Collateral Agent for any expense or indemnify it against any loss or liability to have been incurred by the Trustee or the Collateral Agent through its own negligence, bad faith or willful misconduct.

To secure the payment obligations of the Issuer and the Guarantor s in this Section 7.07, the Trustee shall have a lien prior to the Notes on all money or property held or collected by the Trustee except for such money or property held in trust to pay principal of and interest on particular Notes . Such lien shall survive the satisfaction and discharge of this Indenture .

The obligations of the Issuer and the Guarantor s under this Section 7.07 to compensate and indemnify the Trustee , the Collateral Agent , each predecessor Trustee and predecessor Collateral Agent and to pay or reimburse the Trustee , the Collateral Agent , each predecessor Trustee and each predecessor Collateral Agent for expenses, disbursements and advances shall be joint and several liabilities of the Issuer and each of the Guarantor s and shall survive the resignation or removal of the Trustee or the Collateral Agent and the satisfaction, discharge or other termination of this Indenture , including any termination or rejection hereof under any Bankruptcy Law .

When the Trustee or the Collateral Agent incurs expenses or renders services after an Event of Default specified in Section 6.01 (7) occurs, the expenses and the compensation for the services are intended to constitute expenses of administration under any applicable Bankruptcy Law .

For purposes of this Section 7.07, the term "Trustee " shall include any trustee appointed pursuant to this Article VII; *provided, however*, that the negligence, willful misconduct or bad faith of any Trustee hereunder shall not affect the rights of any other Trustee hereunder. The provisions of this Section 7.07 shall apply to Trustee in its capacity as Collateral Agent , Paying Agent , Registrar and any other Agent under this Indenture and/or the Notes Security Agreement s and shall survive the termination of this Indenture and the resignation or removal of the Trustee and/or the Collateral Agent in any capacity.

Section 7.08 Replacement of Trustee or Collateral Agent .

The Trustee or the Collateral Agent may resign at any time by so notifying the Issuer and the Guarantor s in writing. The Holder s of a majority in principal amount of the outstanding Notes may remove the Trustee or the Collateral Agent by notifying the Issuer and the removed Trustee or Collateral Agent , as applicable, in writing and may appoint a successor Trustee or successor Collateral Agent , as applicable, with the Issuer 's written consent, which consent shall not be unreasonably withheld. The Issuer may remove the Trustee or the Collateral Agent at its election if:

- (1) in the case of the Trustee , the Trustee fails to comply with Section 7.10;
- (2) the Trustee or the Collateral Agent , as applicable, is adjudged a bankrupt or an insolvent or an order for relief is entered with respect to the Trustee under any Bankruptcy Law ;
- (3) a receiver or other public officer takes charge of the Trustee or its property or the Collateral Agent or its property, as applicable; or
- (4) the Trustee or the Collateral Agent , as applicable, otherwise becomes incapable of acting.

If the Trustee or the Collateral Agent resigns or is removed or if a vacancy exists in the office of Trustee or the Collateral Agent for any reason, the Issuer shall promptly appoint a successor Trustee or a successor Collateral Agent , as applicable.

If a successor Trustee or successor Collateral Agent does not take office within 30 days after the retiring Trustee or retiring Collateral Agent , as applicable, resigns or is removed, the retiring Trustee or retiring Collateral Agent , as applicable, the Issuer or the Holder s of a majority in principal amount of the outstanding Notes may petition at the expense of the Issuer any court of competent jurisdiction for the appointment of a successor Trustee or successor Collateral Agent , as applicable.

If the Trustee fails to comply with Section 7.10, Noteholder s holding at least 10% in principal amount of the Notes may petition any court of competent jurisdiction for the removal of the Trustee and the appointment of a successor Trustee .

A successor Trustee or successor Collateral Agent shall deliver a written acceptance of its appointment to the retiring Trustee or retiring Collateral Agent , as applicable, and to the Issuer . Immediately following such delivery, the retiring Trustee or retiring Collateral Agent , as applicable, shall, subject to its rights under Section 7.07, transfer all property held by it as Trustee or Collateral Agent to the successor Trustee or successor Collateral Agent , as applicable, the resignation or removal of the retiring Trustee or the retiring Collateral Agent , as applicable, shall become effective, and the successor Trustee or the successor Collateral Agent , as applicable, shall have all the rights, powers and duties of the Trustee or the Collateral Agent , as applicable, under this Indenture . A successor Trustee or successor Collateral Agent , as applicable, shall mail notice of its succession to each Noteholder . Notwithstanding replacement of the Trustee or the Collateral Agent pursuant to this Section 7.08, the Issuer 's and the Guarantor s' obligations under Section 7.07 shall continue for the benefit of the retiring Trustee or retiring Collateral Agent .

Section 7.09 Successor by Consolidation, Merger, etc.

If the Trustee or the Collateral Agent consolidates with, merges or converts into, or transfers all or substantially all of its corporate trust assets to, another corporation, subject to Section 7.10, the successor corporation without any further act shall be the successor Trustee or successor Collateral Agent , as applicable; *provided* that such entity shall be otherwise qualified and eligible under this Article VII.

Section 7.10 Eligibility; Disqualification.

There will at all times be a Trustee hereunder that is a corporation or national banking association organized and doing business under the laws of the United States of America or of any state thereof that is authorized under such laws to exercise corporate trustee power, that is subject to supervision or examination by federal or state authorities and that has a combined capital and surplus of at least \$100.0 million as set forth in its most recent published annual report of condition.

Section 7.11 Preferential Collection of Claims Against Issuer .

The Trustee is subject to and shall comply with TIA § 311(a), excluding any creditor relationship listed in TIA § 311(b). A Trustee who has resigned or been removed shall be subject to TIA § 311(a) to the extent indicated therein.

Section 7.12 Paying Agent s .

The Issuer shall cause each Paying Agent other than the Trustee to execute and deliver to it and the Trustee an instrument in which such Paying Agent shall agree with the Trustee , subject to the provisions of this Section 7.12:

(A) that it will hold all sums held by it as agent for the payment of principal of, or premium, if any, or interest on, the Notes (whether such sums have been paid to it by the Issuer or by any obligor on the Notes) in trust for the benefit of Holder s or the Trustee ;

(B) that it will at any time during the continuance of any Event of Default , upon written request from the Trustee , deliver to the Trustee all sums so held in trust by it together with a full accounting thereof; and

(C) that it will give the Trustee written notice within three Business Day s of any failure of the Issuer (or by any obligor on the Notes) in the payment of any installment of the principal of, premium, if any, or interest on, the Notes when the same shall be due and payable.

ARTICLE VIII

AMENDMENT, SUPPLEMENT AND WAIVER

Section 8.01 Without Consent of Noteholder s.

Notwithstanding Section 8.02, the Issuer , the Guarantor s and the Trustee and the Collateral Agent may modify and amend or supplement this Indenture , the Notes , the Note Guarantee s or the Notes Security Documents without the consent of any Holder for any of the following purposes:

- (1) to cure any ambiguity, omission, defect or inconsistency;
 - (2) to provide for uncertificated Notes in addition to or in place of Physical Notes (*provided* that such Notes are in registered form for purposes of Section 163(f) of the Code);
 - (3) to provide for the assumption of the Issuer 's or any Guarantor 's obligations to the Holder s in the case of a merger or consolidation or sale of all or substantially all of the Issuer 's or such Guarantor 's assets;
 - (4) to make, complete or confirm any grant of Collateral permitted or required by this Indenture or any of the Notes Security Documents or provide for any release of Collateral pursuant to the terms of this Indenture or any of the Notes Security Documents ;
 - (5) to add any Guarantor or release any Guarantor from its Note Guarantee if such release is permitted by the terms of this Indenture ;
 - (6) to conform the text of this Indenture , the Notes , the Note Guarantee s or the Notes Security Documents to any provision of the "Description of the Notes " section of the Offer ing Memorandum to the extent that such provision in the "Description of the Notes " section of the Offer ing Memorandum was intended to be a verbatim recitation of a provision of this Indenture , the Notes , the Note Guarantee s or the Notes Security Documents ;
 - (7) to provide for the issuance of Additional Notes in accordance with the terms of this Indenture ;
 - (8) to make any change that would provide any additional rights or benefits to the Holder s or that does not adversely affect the rights under this Indenture of any Holder in any material respect;
 - (9) to comply with the rules of any applicable securities depositary;
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(10) to evidence and provide for the acceptance of appointment by a successor or separate Trustee or Collateral Agent with respect to the Notes ;

(11) to make any amendment to the provisions of this Indenture relating to the transfer and legending of Notes ; *provided, however*, that (a) compliance with this Indenture as so amended would not result in Notes being transferred in violation of the Securities Act or any other applicable securities law and (b) such amendment does not adversely affect the rights of Holder s to transfer Notes ;

(12) to enter into any intercreditor agreement pursuant to this Indenture having substantially similar terms with respect to the Holder s as those set forth in the Intercreditor Agreements , take as a whole, or any joinder thereto;

(13) in the case of any Notes Security Document, to include therein any legend required to be set forth therein pursuant to the Intercreditor Agreements or to modify any such legend as required by the Intercreditor Agreements ;

(14) to provide for the succession of any parties to the Notes Security Documents (and other amendments that are administrative or ministerial in nature) in connection with an amendment, renewal, extension, substitution, refinancing, restructuring, replacement, supplementing or other modification from time to time of the ABL Credit Facility , the Term Loan Credit Facility or any other agreement that is not prohibited by this Indenture ;

(15) secure additional extensions of credit and add additional secured creditors holding other Fixed Asset Debt so long as such Fixed Asset Debt is not prohibited by the provisions of this Indenture ; or

(16) to add Additional Assets as Collateral .

After an amendment or supplement under this Section 8.01 becomes effective, the Issuer shall send to the Holder s a notice briefly describing the amendment or supplement. Any failure of the Issuer to send such notice, or any defect therein, shall not, however, in any way impair or affect the validity of any such amendment or supplement.

Section 8.02 With Consent of Noteholder s.

(a) Except to the extent provided in Section 8.01 and subsections (b) and (c) of this Section 8.02, this Indenture , the Notes , any Note Guarantee or the Notes Security Documents may be amended or supplemented with the consent of the Holder s of at least a majority in aggregate principal amount of the then outstanding Notes voting as a single class (including, without limitation, consents obtained in connection with a purchase of, tender offer or exchange offer for, Notes), and any existing Default or Event of Default or compliance with any provision of this Indenture , the Notes , any Note Guarantee or the Notes Security Documents may be waived with the consent of the Holder s of a

majority in aggregate principal amount of the then outstanding Notes voting as a single class (including, without limitation, consents obtained in connection with a purchase of, tender offer or exchange offer for, Notes).

(b) Notwithstanding subsection (a) of this Section 8.02, without the consent of each Holder affected thereby, an amendment or waiver may not (with respect to any Note held by a non-consenting Holder):

- (1) reduce the principal amount of Notes issued under this Indenture whose Holder s must consent to an amendment, supplement or waiver;
 - (2) reduce the principal amount of or change the Maturity Date of any Notes , or alter the provisions with respect to the redemption of any such Notes other than the provisions of Sections 4.07 and 4.08 of this Indenture ;
 - (3) reduce the rate of or change the time for payment of interest on any such Notes ;
 - (4) waive a Default or Event of Default in the payment of principal of or premium, if any, or interest on any such Notes (except a rescission of acceleration of Notes by the Holder s of at least a majority in aggregate principal amount of the then outstanding Notes and a waiver of the Payment Default that resulted from such acceleration);
 - (5) make any such Note payable in currency other than that stated in such Note;
 - (6) modify any of the provisions in this Indenture regarding the waiver of past Default s;
 - (7) amend the contractual right expressly set forth in this Indenture or any Note of any Holder to institute suit for the enforcement of any payment of principal of, premium, if any, or interest on such Note on or after the Stated Maturity or Redemption Date of any such Note;
 - (8) release the Issuer or any Guarantor that is a Significant Subsidiary from any of its obligations under its Note Guarantee or this Indenture otherwise than in accordance with the terms of this Indenture ; or
 - (9) modify or change any provision of this Indenture affecting the ranking of the Notes or Note Guarantee s in a manner adverse to the Holder s.
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(c) In addition, without the consent of the Holder s of at least 66⅔% in aggregate principal amount of the Notes then outstanding (including, without limitation, consents obtained in connection with a purchase of, or tender offer or exchange offer for, the Notes), no amendment, supplement or waiver may (1) have the effect of releasing all or substantially all of the Collateral from the Lien s created pursuant to the Notes Security Documents (except as permitted by the terms of this Indenture or the Notes Security Documents) or changing or altering the priority of the security interests of the Holder s in the Collateral under the Intercreditor Agreements , (2) make any change in the Notes Security Documents or the provisions in this Indenture dealing with the application of proceeds of the Collateral that would adversely affect the Holder s in any material respect or (3) modify the Notes Security Documents or the provisions of this Indenture dealing with Collateral in any manner adverse to the Holder s in any material respect other than in accordance with the terms of this Indenture or the Notes Security Documents ; *provided* that (x) if any such amendment, supplement or waiver will only affect one series of Notes (or less than all series of the Notes) then outstanding under this Indenture , then only the consent of the Holder s of at least 66⅔% in aggregate principal amount of the Notes of such series then outstanding (including, without limitation, consents obtained in connection with a purchase of, or tender offer or exchange offer for, such series of the Notes) shall be required.

(d) It shall not be necessary for the consent of the Holder s under this Section 8.02 to approve the particular form of any proposed amendment or waiver, but it shall be sufficient if such consent approves the substance thereof.

(e) No amendment of, or supplement or waiver to, this Indenture , the Notes , any Note Guarantee or the Notes Security Documents shall be permitted to be effected if such amendment, supplement or waiver is in violation of or inconsistent with the terms of the Intercreditor Agreements . No amendment of, or supplement or waiver to the Intercreditor Agreements shall be permitted to be effected without the consent of the Collateral Agent , the ABL Collateral Agent and any other Fixed Asset Representative then party thereto, other than pursuant to the terms thereof.

(f) After an amendment, supplement or waiver under this Section 8.02 becomes effective, the Issuer shall send to the Holder s a notice briefly describing the amendment, supplement or waiver. Any failure of the Issuer to send such notice, or any defect therein, shall not, however, in any way impair or affect the validity of any such amendment, supplement or waiver.

Section 8.03 [Reserved].

Section 8.04 Revocation and Effect of Consents.

(a) Until an amendment, supplement, waiver or other action becomes effective, a consent to it by a Holder is a continuing consent, conclusive and binding upon such Holder and every subsequent Holder of the same Note or portion thereof, and of any Note issued upon the transfer thereof or in exchange therefor or in place thereof, even if notation of the consent is not made on any such Note.

(b) The Issuer may, but shall not be obligated to, fix a record date for the purpose of determining the Holder s entitled to consent to any amendment, supplement or waiver. If a record date is fixed, then, notwithstanding the preceding paragraph, those Person s who were Noteholder s at such record date (or their duly designated proxies), and only such Person s, shall be entitled to consent to such amendment, supplement, or waiver or to revoke any consent previously given, whether or not such Person s continue to be Noteholder s after such record date. No such consent shall be valid or effective for more than 120 days after such record date unless the consent of the requisite number of Noteholder s has been obtained.

(c) After an amendment, supplement, waiver or other action under Section 8.01 or Section 8.02 becomes effective, it shall bind every Noteholder , unless it makes a change described in any of clauses (1) through (9) of Section 8.02(b). In that case the amendment, supplement, waiver or other action shall bind each Noteholder who has consented to it and every subsequent Holder of the same Note or portion thereof, and of any Note issued upon the transfer thereof or in exchange therefor or in place thereof, even if notation of the consent is not made on any such Note.

Section 8.05 Notation on or Exchange of Notes .

If an amendment, supplement, or waiver changes the terms of a Note, the Trustee (in accordance with the specific written direction of the Issuer) shall request the Holder of the Note to deliver it to the Trustee . In such case, the Trustee shall place an appropriate notation on the Note about the changed terms and return it to the Noteholder . Alternatively, if the Issuer or the Trustee so determines, the Issuer in exchange for the Note shall issue, the Guarantor s shall endorse and, upon receipt of an Authentication Order in accordance with Section 2.01, the Trustee shall authenticate a new Note that reflects the changed terms. Failure to make the appropriate notation or issue a new Note shall not affect the validity and effect of such amendment, supplement or waiver.

Section 8.06 Trustee and Collateral Agent to Sign Amendments, etc.

The Trustee and, as applicable, the Collateral Agent , shall sign any amendment, supplement or waiver authorized pursuant to this Article VIII if the amendment, supplement or waiver does not adversely affect the rights, duties, liabilities or immunities of the Trustee and, as applicable, the Collateral Agent . If it does adversely affect the rights, duties, liabilities or immunities of the Trustee or the Collateral Agent , if applicable, the Trustee or the Collateral Agent , as applicable, may, but need not, sign such amendment, supplement or waiver. The Issuer or the Guarantor s may not sign an amendment, supplement or waiver until its Board of Directors approve it. Notwithstanding anything herein to the contrary, in signing an amendment, supplement or waiver, the Trustee and, as applicable, the Collateral Agent shall be entitled to receive and, subject to Section 7.01, shall be fully protected in relying upon an Officer 's Certificate and (other than in the case of an amendment or supplement for the purpose of adding a Guarantor under this Indenture in accordance with Section 8.01(5)) an Opinion of Counsel stating, in addition to the matters required by Section 12.04, that the execution of such amendment, supplement or waiver is authorized or permitted by this Indenture and that such amendment, supplement or waiver is a legal, valid and binding obligation of the Issuer and

the Guarantor's party thereto, enforceable against the Issuer and the Guarantor's party thereto in accordance with its terms (subject to customary exceptions). Guarantor's may, but shall not be required to, execute supplemental indentures that do not modify such Guarantor's Note Guarantee.

ARTICLE IX

DISCHARGE OF INDENTURE; DEFEASANCE

Section 9.01 Discharge of Indenture.

This Indenture and the Notes Security Documents will be discharged and will cease to be of further effect as to the Notes and Note Guarantee's, and the Trustee and the Collateral Agent, at the expense of the Issuer, shall execute proper instruments acknowledging satisfaction and discharge of this Indenture, the Notes Security Documents, the Notes and the Note Guarantee's, when either:

- (1) the Issuer delivers to the Trustee all outstanding Notes issued under this Indenture (other than (i) Notes which have been mutilated, destroyed, lost or stolen and which have been replaced or paid as provided in Section 2.08 and (ii) Notes for whose payment money has theretofore been deposited in trust or segregated and held in trust by the Issuer and thereafter repaid to the Issuer or discharged from such trust) for cancellation; or
 - (2) (a) all Notes outstanding under this Indenture not theretofore delivered to the Trustee for cancellation (I) have become due and payable, whether on the Maturity Date or as a result of the sending of a notice of redemption, or otherwise (II) will become due and payable within one year, or (III) are to be called for redemption within one year, under arrangements reasonably satisfactory to the Trustee for the giving of notice of redemption by the Trustee in the name, and at the expense, of the Issuer, and the Issuer or any Guarantor irrevocably deposits or cause to be deposited with the Trustee as funds in trust solely for the benefit of the Holder's, cash in U.S. Dollars, U.S. Government Obligations or a combination thereof in an amount sufficient to pay the principal of, premium, if any, and accrued and unpaid interest on the Notes outstanding under this Indenture not theretofore delivered to the Trustee for cancellation on the Maturity Date or on the applicable Redemption Date, as the case may be; (b) no Default or Event of Default (other than a Default or Event of Default resulting from the borrowing of funds to be applied to such deposit and the granting of Lien's in connection therewith) shall have occurred and be continuing on the date of such deposit or shall occur as a result of such deposit and such deposit shall not result in a breach or violation of, or constitute a default under, any material instrument to which the Issuer or any Guarantor is a party or by which the Issuer or any Guarantor is bound (other than that resulting from the borrowing of funds to be applied to such deposit and the granting of Lien's in connection therewith); (c) the Issuer or any Guarantor has paid or caused to be paid all sums payable by the Issuer or any Guarantor under this Indenture; and (d) the Issuer have delivered (I) irrevocable instructions to the Trustee to apply the deposited money toward the payment of the Notes on the Maturity Date or the applicable Redemption Date, as the case may be, and (II) an Officer's Certificate and an Opinion of Counsel, each stating that all conditions precedent
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herein provided relating to the satisfaction and discharge of this Indenture have been complied with.

The Trustee shall acknowledge satisfaction and discharge of this Indenture on demand of and at the expense of the Issuer .

Notwithstanding the satisfaction and discharge of this Indenture , the obligations of the Issuer and the Guarantor s, as applicable, under Sections 4.01, 4.02, 7.07 and, if money shall have been deposited with the Trustee pursuant to Section 9.01(2), 9.05 and the obligations of the Trustee under Sections 9.05, 9.07 and 9.08 shall survive such satisfaction and discharge.

Section 9.02 Legal Defeasance .

The Issuer may, at its option and at any time, elect to have all of its obligations and the obligations of the Guarantor s discharged with respect to all outstanding Notes on the date the conditions set forth in Section 9.04 are satisfied (hereinafter, "Legal Defeasance"). For this purpose, such Legal Defeasance means that the Issuer and the Guarantor s shall be deemed to have paid and discharged the entire Indebtedness represented by the outstanding Notes (including the Note Guarantee s), to have cured all then existing Events of Default and to have satisfied all of its other obligations under such Notes , the Note Guarantee s, this Indenture and the Notes Security Documents , and to have Lien s on the Collateral securing the Notes released (and the Trustee , on demand of and at the expense of the Issuer , shall, subject to Section 9.06, execute proper instruments acknowledging the same), except for the following provisions which shall survive until otherwise terminated or discharged hereunder:

(1) the rights of the Holder s of the outstanding Notes to receive solely from the trust described in Section 9.04 and as more fully set forth in Section 9.04, payments in respect of the principal amount of, premium, if any, and interest on such Notes when such payments are due;

(2) the Issuer's obligations with respect to such Notes under Sections 2.07, 2.08, 2.11, 4.02 and 9.05;

(3) the rights, powers, trusts, duties, and immunities of the Trustee hereunder (including claims of, or payments to, the Trustee under or pursuant to Section 7.07) and the Issuer's and the Guarantor's obligations in connection therewith; and

(4) this Section 9.02.

Concurrently with any Legal Defeasance, the Issuer may, at its further option, cause to be terminated, as of the date on which such Legal Defeasance occurs, all of the obligations under any or all of the Note Guarantee s, if any, then existing and obtain the release of the Note Guarantee s of any or all Guarantor s.

Subject to compliance with this Article IX (other than Section 9.01), the Issuer may exercise its option under this Section 9.02 with respect to the Notes notwithstanding the prior exercise of its option under Section 9.03 with respect to the Notes .

Section 9.03 Covenant Defeasance.

The Issuer may, at its option and at any time, elect to have all of its obligations and the obligations of the Guarantor s under Sections 4.03, 4.05, 4.06, 4.07, 4.08, 4.09, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 11.03, 11.04, 11.05 and 11.06 and clauses (2) through (7) of Section 5.01(a), released with respect to the Notes on the date the conditions set forth in Section 9.04 are satisfied (hereinafter, "Covenant Defeasance"), and the Notes shall thereafter be deemed not to be "outstanding" for the purposes of any direction, waiver, consent or declaration or act of Holder s (and the consequences of any thereof) in connection with such covenants, but shall continue to be deemed "outstanding" for all other purposes hereunder (it being understood that Notes shall not be deemed outstanding for accounting purposes). For this purpose, Covenant Defeasance means that, with respect to the Notes, the Issuer and its Restricted Subsidiaries may omit or fail to comply with and shall have no liability in respect of any term, condition or limitation set forth in any such covenant, whether directly or indirectly, by reason of any reference elsewhere herein to any such covenant or by reason of any reference in any such covenant to any other provision herein or in any other document and such omission to comply shall not constitute a Default or an Event of Default under Section 6.01, but, except as specified above, the remainder of this Indenture, the Notes and the Note Guarantee s shall be unaffected thereby. In addition, upon the Issuer's exercise of the option in this Section 9.03, subject to the satisfaction of the conditions set forth in Section 9.04, Sections 6.01(3), (4), (5), (6), (7) (solely with respect to a Restricted Subsidiary that is a Significant Subsidiary and any group of Restricted Subsidiaries that, taken together, would constitute a Significant Subsidiary), (8) and (9) shall not constitute Events of Default .

Notwithstanding any discharge or release of any obligations under this Indenture pursuant to Section 9.02 or this Section 9.03, the obligations of the Issuer and the Guarantor s, as applicable, under Sections 7.07, 9.05 and 9.06 and, the obligations of the Trustee under Sections 9.05, 9.07 and 9.08 shall survive such discharge or release.

Section 9.04 Conditions to Defeasance or Covenant Defeasance.

The following shall be the conditions to application of Section 9.02 or Section 9.03 to the outstanding Notes :

- (1) the Issuer must irrevocably deposit with the Trustee , in trust, for the benefit of the Holder s issued under this Indenture , cash in U.S. Dollars, U.S. Government Obligations or a combination thereof, in such amounts as will be sufficient, in the opinion of an Advisory Firm (such opinion shall be delivered to the Trustee , and upon which the Trustee shall have no liability in relying), to pay the principal, premium, if any, and interest on the Notes outstanding under this Indenture on the Maturity Date or on the applicable Redemption Date , as the case may be, and the Issuer must specify whether such Notes are being defeased to maturity or to a particular Redemption Date ;
 - (2) in the case of Legal Defeasance , the Issuer shall have delivered to the Trustee an Opinion of Counsel in the United States (upon which the Trustee shall have no liability in relying) confirming that (a) the Issuer has received from, or there has been published by, the Internal Revenue Service a ruling or (b) since the Issue Date , there has been a change in the applicable federal income tax law, in either case to the effect that, and based thereon such Opinion of Counsel shall confirm that, the beneficial owners of the Notes outstanding under this Indenture will not recognize income, gain or loss for federal income tax purposes as a result of such Legal Defeasance and will be subject to federal income tax on the same amounts, in the same manner and at the same times as would have been the case if such Legal Defeasance had not occurred;
 - (3) in the case of Covenant Defeasance , the Issuer shall have delivered to the Trustee an Opinion of Counsel in the United States (upon which the Trustee shall have no liability in relying) confirming that the beneficial owners of the Notes outstanding under this Indenture will not recognize income, gain or loss for federal income tax purposes as a result of such Covenant Defeasance and will be subject to federal income tax on the same amounts, in the same manner and at the same times as would have been the case if such Covenant Defeasance had not occurred;
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(4) no Default or Event of Default shall have occurred and be continuing on the date of such deposit (other than a Default or Event of Default resulting from the borrowing of funds to be applied to such deposit and the granting of Lien s in connection therewith) or insofar as Events of Default from bankruptcy or insolvency events are concerned, at any time in the period ending on the 91st day after the date of deposit;

(5) such Legal Defeasance or Covenant Defeasance will not result in a breach or violation of, or constitute a default under any material agreement or instrument (other than this Indenture) to which the Issuer or any of the Guarantor s is a party or by which the Issuer or any of the Guarantor s is bound (other than that resulting from the borrowing of funds to be applied to such deposit and the granting of Lien s in connection therewith);

(6) the Issuer must deliver to the Trustee an Officer 's Certificate (upon which the Trustee shall have no liability in relying) stating that the deposit was not made by the Issuer with the intent of preferring the Holder s of Notes issued under this Indenture over the other creditors of the Issuer with the intent of defeating, hindering, delaying or defrauding creditors of the Issuer or others; and

(7) the Issuer must deliver to the Trustee an Officer 's Certificate and an Opinion of Counsel upon which the Trustee shall have the right to rely, each stating that all conditions precedent provided for relating to the Legal Defeasance or the Covenant Defeasance have been complied with.

Section 9.05 Deposited Money and U.S. Government Obligations To Be Held in Trust.

Subject to Section 9.08, all money and U.S. Government Obligations (including the proceeds thereof) deposited with the Trustee pursuant to Section 9.01 or Section 9.04, as the case may be, in respect of the outstanding Notes shall be held in trust and applied by the Trustee , in accordance with the provisions of such Notes and this Indenture , to the payment, either directly or through any Paying Agent s (including the Issuer or a Guarantor acting as Paying Agent), to the Holder s of such Notes , of all sums due and to become due thereon in respect of principal, premium, if any, and accrued interest, but such money need not be segregated from other funds except to the extent required by law.

The Issuer and the Guarantor s shall (on a joint and several basis) pay and indemnify the Trustee against any tax, fee or other charge imposed on or assessed against the U.S. Government Obligations deposited pursuant to Section 9.01 or Section 9.04, as the case may be, or the principal, premium, if any, and interest received in respect thereof other than any such tax, fee or other charge which by law is for the account of the Holder s of the outstanding Notes .

Anything in this Article IX to the contrary notwithstanding, the Trustee shall deliver or pay to the Issuer from time to time upon a request of the Issuer any money or U.S. Government Obligations held by it as provided in Section 9.01 or Section 9.04, as the case may be, which, in the opinion of an Advisory Firm expressed in a written certification thereof delivered to the Trustee, are in excess of the amount thereof which would then be required to be deposited to effect an equivalent Legal Defeasance or Covenant Defeasance or satisfaction and discharge of this Indenture.

Section 9.06 Reinstatement.

If the Trustee or any Paying Agent is unable to apply any money or U.S. Government Obligations in accordance with Section 9.01, 9.02 or 9.03, as the case may be, by reason of any order or judgment of any court or governmental authority enjoining, restraining or otherwise prohibiting such application, then the Issuer's and each Guarantor's obligations under this Indenture, the Notes and the Note Guarantee s shall be revived and reinstated as though no deposit had occurred pursuant to this Article IX until such time as the Trustee or such Paying Agent is permitted to apply all such money or U.S. Government Obligations in accordance with Section 9.01, 9.02 or 9.03, as the case may be; *provided* that if the Issuer or the Guarantor s have made any payment of principal of, premium, if any, or accrued interest on any Notes because of the reinstatement of their obligations, the Issuer or the Guarantor s, as the case may be, shall be subrogated to the rights of the Holder s of such Notes to receive such payment from the money or U.S. Government Obligations held by the Trustee or any Paying Agent.

Section 9.07 Moneys Held by Paying Agent.

In connection with the satisfaction and discharge of this Indenture, all moneys and U.S. Government Obligations then held by any Paying Agent under the provisions of this Indenture shall, upon written demand of the Issuer, be paid or delivered to the Trustee, or if sufficient moneys and U.S. Government Obligations have been deposited pursuant to Section 9.04, to the Issuer upon a request of the Issuer (or, if such moneys and U.S. Government Obligations had been deposited by the Guarantor s, to such Guarantor s), and thereupon such Paying Agent shall be released from all further liability with respect to such moneys.

Section 9.08 Moneys Held by Trustee.

Subject to applicable escheat laws, any moneys and U.S. Government Obligations deposited with the Trustee or any Paying Agent or then held by the Issuer or the Guarantor s in trust for the payment of the principal of, or premium, if any, or interest on any Note that are not applied but remain unclaimed by the Holder of such Note for two years after the date upon which the principal of, or premium, if any, or interest on such Note shall have respectively become due and payable shall be repaid or returned to the Issuer (or, if appropriate, the Guarantor s) upon a request of the Issuer, or if such moneys and U.S. Government Obligations are then held by the Issuer or the Guarantor s in trust, such moneys and U.S. Government Obligations shall be released from such trust; and the Holder of such Note entitled to receive such payment shall thereafter, as an unsecured general creditor, look only

to the Issuer and the Guarantor s for the payment thereof, and all liability of the Trustee or such Paying Agent with respect to such trust moneys and U.S. Government Obligations shall thereupon cease.

ARTICLE X

GUARANTEE OF SECURITIES

Section 10.01 Guarantee.

Subject to this Article X, the Guarantor s, by execution of this Indenture , jointly and severally, guarantee to each Holder , the Collateral Agent and to the Trustee (i) the due and punctual payment of the principal of, premium, if any, and interest on each Note, when and as the same shall become due and payable, whether on the Maturity Date , by acceleration or otherwise, the due and punctual payment of interest on the overdue principal of and interest on the Notes , to the extent lawful, and the due and punctual payment of all other obligations and due and punctual performance of all obligations of the Issuer to the Holder s, the Collateral Agent or the Trustee all in accordance with the terms of such Note and this Indenture and the Notes Security Documents together with all other Obligations and (ii) in the case of any extension of time of payment or renewal of any Notes or any of such other obligations, that the same will be promptly paid in full when due or performed in accordance with the terms of the extension or renewal, at stated maturity, by acceleration or otherwise, in each case, to the limitation set forth in Section 10.06. Each Guarantor , by execution of this Indenture , agrees that, subject only to the applicable provisions, if any, of Section 10.06, its obligations hereunder shall be absolute and unconditional, irrespective of the validity, regularity or enforceability of any such Note or this Indenture , any failure to enforce the provisions of any such Note or this Indenture , any waiver or consent with respect thereto by the Holder of such Note, or any other circumstances which may otherwise constitute a legal or equitable discharge of a surety or such Guarantor . Each Guarantor further agrees that its Note Guarantee herein constitutes a Guarantee of payment when due (and not a Guarantee of collection).

Each Guarantor hereby waives (to the extent permitted by law) diligence, presentment, demand for payment, filing of claims with a court in the event of insolvency or bankruptcy of the Issuer , any right to require a proceeding first against the Issuer , protest or notice with respect to any such Note or the Indebtedness evidenced thereby and all demands whatsoever, and covenants that this Guarantee will not be discharged as to any such Note except by payment in full of the principal thereof and interest thereon. Each Guarantor hereby agrees that, as between such Guarantor , on the one hand, and the Holder s and the Trustee , on the other hand, (i) the maturity of the obligations guaranteed hereby may be accelerated as provided in Article VI for the purposes of this Guarantee , notwithstanding any stay, injunction or other prohibition preventing such acceleration in respect of the obligations guaranteed hereby, and (ii) in the event of any declaration of acceleration of such obligations as provided in Article VI, such obligations (whether or not due and payable) shall forthwith become due and payable by each Guarantor for the purpose of this Guarantee .

The Guarantor s shall have the right to seek contribution from any non-paying Guarantor so long as the exercise of such right does not impair the rights of the Trustee or any Holder under the Note Guarantee s. Each Guarantor that makes a payment under its Note Guarantee shall be

entitled upon payment in full of all guaranteed obligations under this Indenture to a contribution from each other Guarantor in an amount equal to such other Guarantor's *pro rata* portion of such payment based on the respective net assets of all the Guarantors at the time of such payment determined in accordance with GAAP.

Section 10.02 Execution and Delivery of Note Guarantee.

To evidence the Note Guarantee set forth in Section 10.01, each Guarantor hereby agrees this Indenture (or supplemental indenture in the form of Exhibit J hereto) shall be executed by either manual, facsimile or electronic (including ".pdf") signature of an Officer of such Guarantor.

Each of the Guarantors hereby agrees that its Note Guarantee set forth in Section 10.01 shall be in full force and effect notwithstanding the absence of the endorsement of any notation of such Guarantee on the Notes.

If an Officer of a Guarantor whose signature is on this Indenture (or a supplemental indenture in the form of Exhibit J hereto) no longer holds that office at the time the Trustee authenticates the Note, such Guarantor's Guarantee of such Note shall be valid nevertheless.

The delivery of any Note by the Trustee, after the authentication thereof hereunder, shall constitute due delivery of any Note Guarantee set forth in this Indenture on behalf of the Guarantor.

Section 10.03 Release of Guarantors.

(a) A Note Guarantee of a Subsidiary Guarantor will be unconditionally and automatically released and discharged upon any of the following:

(1) any Transfer (including, without limitation, by way of consolidation, merger, dividend, distribution or otherwise) by such Subsidiary Guarantor to any Person that is not a Guarantor or the Issuer of all or substantially all of the properties and assets of such Subsidiary Guarantor, so long as such Transfer is made in accordance with the applicable provisions of this Indenture and such Subsidiary Guarantor is also released from its Guarantee and all pledges and security interests granted in connection with the Term Loan Credit Facility and Certain Other Indebtedness;

(2) the designation by the Issuer of such Subsidiary Guarantor as an Unrestricted Subsidiary in accordance with the applicable provisions of this Indenture ;

(3) any Transfer directly or indirectly (including, without limitation, by way of consolidation, merger, dividend, distribution or otherwise) to any Person that is not a Guarantor or the Issuer of Equity Interests of such Subsidiary Guarantor or any issuance by such Subsidiary Guarantor of its Equity Interests , such that such Subsidiary Guarantor ceases to be a Subsidiary of the Issuer , so long as such Transfer is made in accordance with the applicable provisions of this Indenture and such Subsidiary Guarantor is also released from its Guarantee and all pledges and security interests granted in connection with the Term Loan Credit Facility and Certain Other Indebtedness ;

(4) the merger or consolidation of any Subsidiary Guarantor with and into the Issuer or another Subsidiary Guarantor that is the surviving Person in such merger or consolidation, or, subject to compliance with Article V, upon the liquidation of a Subsidiary Guarantor ;

(5) the release or discharge of the Guarantee by, or direct obligation of, such Subsidiary Guarantor in respect of the Term Loan Credit Facility , Certain Other Indebtedness or any other Indebtedness that gave rise to such Subsidiary Guarantor 's obligation to provide such Note Guarantee , except in each case, a release or discharge by, or as a result of, payment under such Obligation or Guarantee , but only if the Lien s on Collateral of such Subsidiary Guarantor are also substantially concurrently released pursuant to the terms of any other ABL Obligations and Fixed Asset Obligations ;

(6) upon payment in full of the principal of, accrual and unpaid interest and premium (if any) on the Notes ; or

(7) upon Legal Defeasance , Covenant Defeasance or satisfaction and discharge of this Indenture in accordance with Article IX.

(b) A Note Guarantee of a Subsidiary Guarantor also will be automatically released upon the applicable Subsidiary ceasing to be a Subsidiary as a result of any foreclosure of any pledge or security interest securing either the Term Loan Credit Facility or the Notes or other exercise of remedies in respect thereof in accordance with the Intercreditor Agreements .

(c) The Note Guarantee s of Holdings will be released (i) if the Issuer exercises its Legal Defeasance option or Covenant Defeasance option as described under Article IX, (ii) if the Issuer 's Obligations under this Indenture are discharged (including pursuant to a satisfaction and discharge of this Indenture as described in Article IX; through redemption or repurchase of all the Notes ; through repayment in full of the Notes ; or otherwise) in accordance with the terms of this Indenture or (iii) if there is a release or discharge of such Guarantee by, or direct obligation of, Holdings of the obligations under the Term Loan Credit Facility or Certain Other Indebtedness , except a discharge or release by or as a result of payment in connection with the enforcement of remedies under such Guarantee or direct obligation.

(d) No such release or discharge of a Note Guarantee of a Guarantor shall be effective against the Trustee or the Holder s to which such Note Guarantee relates until the Issuer shall have delivered to the Trustee an Officer 's Certificate , upon which the Trustee shall have the right to rely, stating that all conditions precedent provided for in this Indenture relating to such transactions have been complied with. At the request of the Issuer , and upon being provided an Officer 's Certificate , the Trustee shall execute and deliver an instrument evidencing such release.

(e) If the Note Guarantee of any Guarantor is deemed to be released or is automatically released, the Issuer shall deliver to the Trustee an Officer 's Certificate stating the identity of the released Guarantor , the basis for release in reasonable detail, and that such release complies with this Indenture . At the request of the Issuer , and upon delivery to the Trustee of an Officer 's Certificate and an Opinion of Counsel that a Guarantor has been released and that execution by the Trustee of an appropriate instrument evidencing the release of such Guarantor from its Guarantee complies with this Indenture , the Trustee shall execute any documents reasonably requested by either the Issuer or a Guarantor in order to evidence the release of such Guarantor from its obligations under its Guarantee endorsed on the Notes and under this Article X (it being understood that the failure to obtain any such instrument shall not impair any automatic release pursuant to this Section 10.03).

Section 10.04 Waiver of Subrogation.

Each Guarantor hereby irrevocably waives any claim or other rights which it may now or hereafter acquire against the Issuer that arise from the existence, payment, performance or enforcement of such Guarantor 's obligations under its Note Guarantee and this Indenture , including, without limitation, any right of subrogation, reimbursement, exoneration, indemnification, and any right to participate in any claim or remedy of any Holder against the Issuer , whether or not such claim, remedy or right arises in equity, or under contract, statute or common law, including, without limitation, the right to take or receive from the Issuer , directly or indirectly, in cash or other property or by set-off or in any other manner, payment or Note on account of such claim or other rights. If any amount shall be paid to any Guarantor in violation of the preceding sentence and the Notes shall not have been paid in full, such amount shall have been deemed to have been paid to such Guarantor for the benefit of, and held in trust for the benefit of, the Holder s, and shall forthwith be paid to the Trustee for the benefit of such Holder s to be credited and applied upon the Notes , whether matured or unmatured, in accordance with the terms of this Indenture . Each Guarantor acknowledges that it will

receive direct and indirect benefits from the financing arrangements contemplated by this Indenture and that the waiver set forth in this Section 10.04 is knowingly made in contemplation of such benefits.

Section 10.05 [Reserved].

Section 10.06 Limitation on Guarantor 's Liability.

Each Guarantor , and by its acceptance hereof, each Holder and the Trustee , hereby confirm that it is the intention of all such parties that the Guarantee of a Guarantor does not constitute a fraudulent transfer or conveyance for purposes of the Bankruptcy Law , the Uniform Fraudulent Conveyance Act, the Uniform Fraudulent Transfer Act or any similar U.S. Federal or state or other applicable law. To effectuate the foregoing intention, the Trustee , each Holder and each Guarantor hereby irrevocably agree that the obligations of a Guarantor under its Note Guarantee shall be limited to the maximum amount as will, after giving effect to all other contingent and fixed liabilities of such Guarantor , result in the obligations of such Guarantor not constituting such a fraudulent transfer or conveyance.

ARTICLE XI.

COLLATERAL AND SECURITY

Section 11.01 Collateral.

(a) The due and punctual payment of the principal of, premium, if any, and interest on the Notes , when and as the same shall become due and payable, whether on the Maturity Date , by acceleration or otherwise, the due and punctual payment of interest on the overdue principal of and interest on the Notes , to the extent lawful, and the due and punctual performance of all Obligations of the Issuer and the Guarantor s to the Holder s, the Trustee and/or the Collateral Agent , in accordance with the terms of the Notes , this Indenture , the Note Guarantee s and the Notes Security Documents , shall be secured, according to the terms hereunder or thereunder, by a Lien on the Collateral on an equal and ratable basis with any other Fixed Asset Obligations , subject to Permitted Lien s and the terms of the Intercreditor Agreements , as provided in this Indenture and the Notes Security Documents , and will be secured by all of the Collateral pledged pursuant to the Notes Security Documents hereafter delivered as required or permitted by this Indenture and the Notes Security Documents , and subject to the terms thereof. The Issuer , for the benefit of the Holder s, hereby appoints U.S. Bank National Association as the initial Collateral Agent , and the Collateral Agent is hereby authorized and directed to execute and deliver the Notes Security Documents . Each Holder by its acceptance of any Notes and the Note Guarantee s thereof, irrevocably consents and agrees to such appointment.

(b) Each Holder, by its acceptance of any Notes and the Note Guarantee s, consents and agrees to the terms of the Notes Security Documents (including, without limitation, the provisions providing for foreclosure and release of Collateral and the automatic amendments, supplements, consents, waivers and other modifications thereto without the consent of the Holder s) as the same may be in effect or may be amended from time to time in accordance with their terms and this Indenture and authorizes and directs the Collateral Agent and the Trustee, as applicable, to enter into the Notes Security Documents on the Issue Date, and, at any time after the Issue Date, if applicable, any intercreditor agreement in respect of Junior Indebtedness (any such agreement, in customary market form (as reasonably determined by the Issuer as set forth in an Officer's Certificate delivered to the Trustee and the Collateral Agent) that neither contravenes nor is prohibited by this Indenture and other Indebtedness secured by any Collateral or the Interc Creditor Agreements and otherwise in form and substance reasonably acceptable to the Notes Collateral Agent), and any joinders to the foregoing, to which it is a party, at any time after the Issue Date, if applicable, to perform its obligations and exercise its rights thereunder in accordance therewith.

(c) The Trustee and each Holder, by accepting the Notes and the Note Guarantee s, acknowledges that, as more fully set forth in the Notes Security Documents, the Collateral as hereafter constituted shall be held for the benefit of all the Holder s and the Trustee and the Collateral Agent, and that the Lien of this Indenture and the Notes Security Documents in respect of the Trustee, the Collateral Agent and the Holder s is subject to and qualified and limited in all respects by the Notes Security Documents and actions that may be taken thereunder.

Section 11.02 Maintenance of Collateral.

The Issuer and the Guarantor s (other than the Dutch Guarantor) shall maintain and preserve the Collateral; *provided* that the Issuer and the Guarantor s may dispose of Collateral to the extent not otherwise prohibited by this Indenture. Except as would not, individually or in the aggregate, reasonably be expected to have a material adverse effect on (a) the ability of the Issuer and the Guarantor s (other than the Dutch Guarantor) (taken as a whole) to perform their respective obligations hereunder or under the Notes Security Documents or (b) on the rights and remedies of the Holder s under this Indenture or the Notes Security Documents, the Issuer and the Guarantor s (other than the Dutch Guarantor) shall pay all real estate and other taxes (except such as are being contested in good faith by appropriate negotiations or proceedings), and use commercially reasonable efforts to maintain in full force and effect insurance in amounts (after giving effect to self-insurance), and that insures against such losses and risks, as are reasonable for the type and size of the business conducted by the Issuer and the Guarantor s (other than the Dutch Guarantor).

Section 11.03 Further Assurances.

(a) On or following the Issue Date and subject to the limitations and exceptions set forth in the Notes Security Documents and this Indenture (including with respect to Excluded Assets), the Issuer and the Guarantor s (other than the Dutch Guarantor) shall execute, deliver and file, as appropriate any and all further documents, financing statements (including continuation statements and amendments to financing statements), agreements and instruments, and take all further actions that may be required under applicable law, in order to grant, preserve, protect and perfect the validity and priority of the security interests and Lien s created or intended to be created by the Notes Security Documents in the Collateral subject to the exceptions set forth in this Indenture and Notes Security Documents ; *provided* that for so long as there any other outstanding Fixed Asset Obligations , no actions shall be required to be taken with respect to the perfection of the security interest in the Collateral to the extent such actions are not required to be taken, and have not been taken, with respect to the Fixed Asset Documents for such other Fixed Asset Obligations . In addition, to the extent required under this Indenture or any of the Notes Security Documents , from time to time, the Issuer and the Guarantor s (other than the Dutch Guarantor) will reasonably promptly secure the obligations under this Indenture and Notes Security Documents by pledging or creating, or causing to be pledged or created, perfected security interests and Lien s with respect to the Collateral to the extent required by this Indenture and/or the Notes Security Documents ; *provided* that for so long as there any outstanding Fixed Asset Obligations , no actions shall be required to be taken with respect to the pledging of Collateral or creation of security interests in the Collateral to the extent such actions are not required to be taken, and have not been taken, with respect to the Fixed Asset Documents for such other Fixed Asset Obligations .

(b) Neither the Collateral Agent nor the Trustee undertakes any responsibility whatsoever to determine whether any of the foregoing covenants have been satisfied, and neither shall have any liability whatsoever arising out of the failure of the Issuer or any of the Guarantor s to satisfy such requirements.

Section 11.04 After-Acquired Collateral.

From and after the Issue Date , and subject to the limitations and exceptions set forth in the Notes Security Documents and this Indenture (including with respect to Excluded Assets), upon the acquisition by any of the Issuer or the Guarantor s (other than the Dutch Guarantor) of any assets, including, but not limited to, any Material Real Property , that qualifies as Collateral , that, in any such case, form part of the Collateral , the Issuer or such Guarantor (other than the Dutch Guarantor) shall execute and deliver and file, as applicable (i) with regard to real property that qualifies as Collateral , the items described under Section 11.05 within 90 days of the date of acquisition of the applicable asset (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health) and (ii) with regard to any other after-acquired property that qualifies as Collateral , the Issuer or such Guarantor

(other than the Dutch Guarantor) shall execute, file and deliver, to the extent required by this Indenture and/or the Notes Security Documents , any information, documentation, financing statements or other certificates and opinions of counsel as may be necessary to vest in the Collateral Agent a perfected security interest, with the priority required by this Indenture and the Notes Security Documents , subject only to Permitted Lien s and the perfection exceptions (as provided in the Notes Security Documents), in such after-acquired property and to have such after-acquired property added to the Collateral , and thereupon all provisions of this Indenture and the Notes Security Documents relating to the Collateral shall be deemed to relate to such after-acquired property to the same extent and with the same force and effect.

Neither the Collateral Agent nor the Trustee undertakes any responsibility whatsoever to determine whether any of the foregoing covenants have been satisfied, and neither shall have any liability whatsoever arising out of the failure of the Issuer or any of the Guarantor s to satisfy such requirements.

Section 11.05 Real Estate Mortgage s and Filings.

With respect to any fee interest in any Premises owned by the Issuer or a Guarantor (other than the Dutch Guarantor) on the Issue Date or acquired by the Issuer or a Guarantor (other than the Dutch Guarantor) after the Issue Date that forms a part of the Collateral (but specifically excluding Excluded Assets), the Issuer shall, subject to the terms of the Intercreditor Agreements :

(1) within 90 days of the Issue Date (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health) or within 90 days of the date of acquisition (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health), deliver, or cause to be delivered, Mortgage s (and other documentation and instruments referred to in clause (5) of this Section 11.05) (with respect to Material Real Properties only), pledge supplements, security agreement supplements and other security agreements, as specified by and in form and substance reasonably satisfactory to the Collateral Agent (consistent with the Notes Security Documents), securing payment of all the Obligations of the Issuer or applicable Guarantor (other than the Dutch Guarantor), as the case may be, under this Indenture and constituting Lien s on all such properties;

(2) within 90 days of the Issue Date (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health) or within 90 days of the date of acquisition (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health), take, and cause such Guarantor (other than the Dutch Guarantor) to take, whatever action (including, without limitation, the delivery of Mortgage s (with respect to Material Real Properties only), the filing of UCC financing statements, the giving of notices and delivery of stock and membership interest certificates) may be necessary or advisable in the reasonable opinion of the Collateral Agent to vest in the Collateral Agent to grant a valid and subsisting Lien s on the properties purported to be subject to the Mortgage s, pledge supplements and security agreements delivered pursuant to this Indenture and/or Notes Security Documents , in each case, to the extent required under this Indenture and/or Notes Security Documents and subject to the perfection exceptions (as provided in the Notes Security Documents), enforceable against all third parties in accordance with their terms;

(3) within 90 days after the request of the Trustee or the Collateral Agent (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health), deliver to such party, a signed copy of one or more opinions, addressed to such party, of counsel for the Issuer reasonably acceptable to such party as is customary, covering the enforceability and other customary matters related to the Mortgage s and opinions of counsel in the jurisdiction of organization of the owner of the applicable Premises covering the due authorization, execution, delivery and other customary matters related to the Mortgage s;

(4) within 90 days of the Issue Date (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health) or within 90 days of the date of acquisition (as such date may be adjusted to the extent any such actions are not or cannot be completed within such timeframe as a result of the occurrence of the COVID-19 pandemic (including without limitation, as a result of any notary services being unavailable) after the use of commercially reasonable efforts to do so or without undue burden or expense or risk to human health), deliver to such party with respect to each Material Real Property owned in fee by a Guarantor (other than the Dutch Guarantor) that is the subject of such request, title reports in scope, form and substance reasonably satisfactory to such party, fully paid American Land Title Association Lender's Extended Coverage title insurance policies or the equivalent or other form available in the applicable jurisdiction in form and substance, with

endorsements and in amounts, reasonably acceptable to the Collateral Agent (not to exceed the value of the Material Real Properties covered thereby) and surveys that are in the possession of the Issuer or Guarantor (other than the Dutch Guarantor), as applicable; and

(5) at any time and from time to time, promptly execute and deliver any and all further instruments and documents and take all such other action as the Collateral Agent in its reasonable judgment may deem necessary in obtaining the full benefits of, or in perfecting and preserving the Lien s of, such guarantees, Mortgage s, pledge supplements and security agreements.

Neither the Collateral Agent nor the Trustee undertakes any responsibility whatsoever to determine whether any of the foregoing covenants have been satisfied, and neither shall have any liability whatsoever arising out of the failure of the Issuer or any of the Guarantor s to satisfy such post-closing requirements.

Section 11.06 Negative Pledge.

The Issuer and each Guarantor (other than the Dutch Guarantor) will not, and the Issuer will not permit any of its Restricted Subsidiaries to, further pledge the Collateral as security or otherwise, subject to Permitted Lien s . The Issuer , however, subject to compliance by the Issuer with the Section 4.09 and Section 4.13, has the ability under this Indenture to issue Additional Notes , which may be secured by the Collateral .

Section 11.07 Release of Lien s on the Collateral .

(a) The Issuer and the Guarantor s are entitled to the releases of property and other assets included in the Collateral from the Lien s securing the Notes and the related Note Guarantee s, as applicable, under any one or more of the following circumstances:

(1) in whole, upon payment in full of the principal of, together with accrued and unpaid interest and premium, if any, on, such series of Notes and all other related Obligations under this Indenture , the Note Guarantee s and the Notes Security Documents that are due and payable at or prior to the time such principal, together with accrued and unpaid interest and premium, if any, are paid;

(2) in whole, upon satisfaction and discharge of this Indenture in accordance with Article IX;

(3) in whole, upon a legal defeasance or covenant defeasance with respect to such series as set forth under Article IX;

(4) in whole or in part, as to any asset constituting Collateral, in accordance with, and as expressly provided for under, the Notes Security Documents and this Indenture;

(5) with the consent of Holders of at least $66\frac{2}{3}\%$ in aggregate principal amount of such series of Notes, including, without limitation, consents obtained in connection with a tender offer or exchange offer for, or purchase of, such series of Notes as provided under Section 8.02;

(6) as to the property and assets of a Subsidiary Guarantor that is released from its Note Guarantee in accordance with Section 10.03;

(7) in part, as to any property or assets constituting Collateral, to enable the Issuer and/or Guarantors to consummate the disposition of such property or other assets to a Person that is not the Issuer or a Guarantor to the extent not prohibited by Section 4.08;

(8) in connection with any enforcement action taken by the Controlling Fixed Asset Collateral Agent or the Fixed Asset Collateral Agents (as defined in the Relative Priority Intercreditor Agreement), in each case, in accordance with the terms of the Pari Passu Intercreditor Agreement or the Relative Priority Intercreditor Agreement, respectively; and

(9) as described under Article VIII hereof.

(b) [Reserved]

(c) If required by this Indenture, upon delivery by the Issuer or such Guarantor to the Trustee of a form of release accompanied by an Officer's Certificate that such release is permitted under the terms of the Indenture and the Notes Security Documents, as applicable, the Trustee and the Collateral Agent shall execute, deliver or acknowledge (at the Issuer's expense) such instruments or releases to evidence the release of any Collateral permitted to be released pursuant to this Indenture or the Notes Security Documents and shall do or cause to be done (at the Issuer's expense) all acts reasonably requested of them to release such Lien as soon as is reasonably practicable. Neither the Trustee nor the Collateral Agent shall be liable for any such release undertaken in reliance upon any such Officer's Certificate, and notwithstanding any term hereof or in any Notes Security Document to the contrary, the Trustee and the Collateral Agent shall not be under any obligation to release any such Lien and security interest, or execute and deliver any such instrument of release, satisfaction or termination, unless and until it receives such Officer's Certificate.

Section 11.08 Authorization of Actions to be Taken by the Trustee or the Collateral Agent under the Notes Security Documents.

(a) Subject to the provisions of Article VII of this Indenture and the provisions of the Notes Security Documents, each of the Trustee or the Collateral Agent may (but shall in no event be required to), in its sole discretion and without the consent of the Holder s, on behalf of the Holder s, take all actions it deems necessary or appropriate in order to (i) enforce any of its rights or any of the rights of the Holder s under the Notes Security Documents and (ii) collect and receive any and all amounts payable in respect of the Collateral in respect of the obligations of the Issuer and the Guarantor s (other than the Dutch Guarantor) hereunder and thereunder. Subject to the provisions of the Notes Security Documents, the Trustee or the Collateral Agent shall have the power, but not the obligation, to institute and to maintain such suits and proceedings as it may deem expedient to prevent any impairment of the Collateral by any acts that may be unlawful or in violation of the Notes Security Documents or this Indenture, and such suits and proceedings as the Trustee or the Collateral Agent may deem expedient to preserve or protect its interest and the interests of the Holder s in the Collateral.

(b) None of the Collateral Agent, Trustee, Paying Agent, Registrar, such other agent nor any of their respective officers, directors, employees, attorneys or agents will be responsible or liable for the existence, genuineness, value or protection of any Collateral (except the custody of Collateral in its possession using the same care it provides for its own possessory collateral and the accounting for monies actually received), for the legality, enforceability, effectiveness or sufficiency of the Notes Security Documents, or for the creation, perfection, priority, sufficiency or protection of any Lien s or any defect or deficiency. In addition, none of the foregoing will have any duties or responsibilities or obligations other than those expressly assumed by it in this Indenture and the Notes Security Documents and will not be required to take any action that is contrary to applicable law or any provision of this Indenture or any of the Notes Security Documents.

Section 11.09 Information Regarding Collateral.

(a) The Issuer will furnish to the Collateral Agent, with respect to the Issuer or any Guarantor (other than the Dutch Guarantor), prompt written notice following any change in such Person 's (1) legal name, (2) jurisdiction of organization or formation or (3) identity or corporate structure, in each case, within 30 days of such change (or such later date as the Term Loan Credit Facility Collateral Agent may have agreed to under the Term Loan Credit Facility). Promptly upon the occurrence of any of the foregoing, the Issuer and the Guarantor s (other than the Dutch Guarantor) will make all filings under the UCC and any other applicable laws that are required by this Indenture and/or the Notes Security Documents in order for the Collateral to be perfected subject to the Lien of the Collateral Agent under this Indenture and/or the Notes Security Documents in the manner and to the extent required by this Indenture or any of the Notes Security Documents, and shall take all necessary action so that such Lien is perfected with the same priority as immediately prior to such change to the extent required by this Indenture and/or the Notes Security Documents.

(b) The Issuer shall deliver to the Trustee and the Collateral Agent an Officer's Certificate attaching supplemental schedules required under the Notes Security Documents to the extent required under and at the same time as similar supplemental schedules are delivered to the Term Loan Credit Facility Collateral Agent.

Section 11.10 Notes Security Documents.

The provisions in this Indenture relating to Collateral are subject to the provisions of the Notes Security Documents. The Issuer, the Guarantors (other than the Dutch Guarantor), the Trustee and the Collateral Agent acknowledge and agree to be bound by the provisions of the Notes Security Documents.

Section 11.11 Collateral Agent.

Notwithstanding anything else to the contrary herein, whenever reference is made in this Indenture or the Notes Security Documents to any discretionary action by, consent, designation, specification, requirement or approval of, notice, request or other communication from, or other direction given or action to be undertaken or to be (or not to be) suffered or omitted by the Collateral Agent or to any election, decision, opinion, acceptance, use of judgment, expression of satisfaction, reasonable satisfaction or other exercise of discretion, rights or remedies to be made (or not to be made) by the Collateral Agent, it is understood that in all cases the Collateral Agent shall be fully justified in failing or refusing to take any such action under this Indenture or the Notes Security Documents if it shall not have received such written instruction, advice or concurrence of the Holders of a majority of an aggregate principal amount of the applicable series of Notes.

ARTICLE XII.

MISCELLANEOUS

Section 12.01 Currency Indemnity.

The U.S. Dollar is the sole currency (the "Required Currency") of account and payment for all sums payable by the Issuer or any Guarantor under or in connection with the Notes, this Indenture and the Guarantees, including damages. Any amount with respect to the Notes, this Indenture or the Guarantees received or recovered in a currency other than the Required Currency, whether as a result of, or the enforcement of, a judgment or order of a court of any jurisdiction, in the winding-up or dissolution of the Issuer or any Guarantor or otherwise by any Holder or by the Trustee, Collateral Agent or Paying Agent, in respect of any sum expressed to be due to it from the Issuer or any Guarantor will only constitute a discharge to the Issuer or such Guarantor to the extent of the Required Currency amount which the recipient is able to purchase with the amount so received or recovered in that other currency on the date of that receipt or recovery (or, if it is not practicable to make that purchase on that date, on the first date on which it is practicable to do so).

If that Required Currency amount is less than the Required Currency amount expressed to be due to the recipient or the Trustee , Collateral Agent or Paying Agent under the Notes , the Issuer and each Guarantor will indemnify such recipient and/or the Trustee , Collateral Agent or Paying Agent against any loss sustained by it as a result. In any event, the Issuer and each Guarantor will indemnify the recipient against the cost of making any such purchase. For the purposes of this currency indemnity provision, it will be prima facie evidence of the matter stated therein, for the Holder of a Note or the Trustee , Collateral Agent or Paying Agent to certify in a manner satisfactory to the Issuer (indicating the sources of information used) the loss it incurred in making any such purchase. These indemnities constitute a separate and independent obligation from the Issuer 's and each Guarantor 's other obligations, will give rise to a separate and independent cause of action, will apply irrespective of any waiver granted by any Holder of a Note or the Trustee , Collateral Agent or Paying Agent (other than a waiver of the indemnities set out herein) and will continue in full force and effect despite any other judgment, order, claim or proof for a liquidated amount in respect of any sum due under any Note or to the Trustee or Collateral Agent . For the purposes of determining the amount in a currency other than the Required Currency , such amount shall be determined using the relevant currency exchange rate then in effect.

Section 12.02 Notices.

Except for notice or communications to Holder s, any notice or communication shall be given if in writing and delivered in person or mailed by first class mail (registered or certified, return receipt requested), fax or overnight air courier guaranteeing next day delivery, addressed as follows, or given electronically:

If to the Issuer or any Guarantor :

Cooper-Standard Automotive Inc.
40300 Traditions Drive
Northville, Michigan 48168
Attention: Chief Legal Officer
Email: Joanna.Totsky@CooperStandard.com

With copies to:

Simpson Thacher & Bartlett LLP
425 Lexington Avenue
New York, NY 10017
Facsimile: (212) 455-2502
Attention: Kenneth B. Wallach
E-mail: kwallach@stblaw.com

If to the Trustee or the Collateral Agent :

U.S. Bank National Association
535 Griswold Street, Suite 550
Detroit, Michigan 48226
Attention: Global Corporate Trust Services
Fax: 313-963-9428
E-mail: james.kowalski@usbank.com

The Issuer , the Guarantor s, the Trustee or the Collateral Agent by written notice to the others may designate additional or different addresses for subsequent notices or communications.

All notices and communications (other than those sent to Holder s) shall be deemed to have been duly given at the time delivered by hand, if personally delivered; five (5) calendar days after mailing if sent by first class mail, postage prepaid (except that a notice of change of address shall not be deemed to have been given until actually received by the addressee); when receipt acknowledged, if faxed; on the first date on which the publication is made, if given by publication; the next Business Day after timely delivery to the courier, if sent by overnight air courier guaranteeing next day delivery; and at the time sent, if given electronically. Notice otherwise given in accordance with the procedures of the Depository will be deemed given on the date sent to the Depository .

Each of the Trustee and the Collateral Agent shall accept and act upon instructions, directions, reports, notices and other communications or information pursuant to this Indenture sent by unsecured electronic transmissions (including email and .pdf attachments); *provided* that (i) neither the Trustee nor the Collateral Agent shall have any duty or obligation to verify or confirm that the Person sending instructions, directions, reports, notices or other communications or information by electronic transmission is, in fact, a Person authorized to give such instructions, directions, reports, notices or other communications or information on behalf of the party purporting to send such electronic transmission; and neither the Trustee nor the Collateral Agent shall have any liability for any losses, liabilities, costs or expenses incurred or sustained by any party as a result of such reliance upon or compliance with such instructions, directions, reports, notices or other communications or information and (ii) each other party agrees to assume all risks arising out of the use of electronic methods to submit instructions, directions, reports, notices or other communications or information to the Trustee and the Collateral Agent , including the risk of the Trustee or the Collateral Agent acting on unauthorized instructions, notices, reports or other communications or information, and the risk of interception and misuse by third parties.

Any notice or communication to a Holder shall be mailed by first class mail, certified or registered, return receipt requested, or by overnight air courier guaranteeing next day delivery to its address shown on the register kept by the Registrar . Any notice or communication shall also be so mailed to any Person to the extent required by the rules of any applicable securities depository. Failure to mail a notice or communication to a Holder or any defect in it shall not affect its sufficiency with respect to other Holder s. Where this Indenture or any Note provides for notice of any event (including any notice of redemption or repurchase) to a Holder of a Global Note (whether by mail or otherwise), such notice shall be sufficiently given if given to the Depository (or its designee) pursuant to the standing instructions from the Depository or its designee, including by electronic mail in accordance with applicable Depository procedures.

If a notice or communication to a Holder is mailed in the manner provided above, it shall be deemed duly given, whether or not the addressee receives it.

In case by reason of the suspension of regular mail service, or by reason of any other cause, it shall be impossible to mail any notice as required by this Indenture , then such method of notification as shall be made with the approval of the Trustee shall constitute a sufficient mailing of such notice.

Notwithstanding anything herein to the contrary, any notice to the Trustee shall be deemed given when actually received.

Section 12.03 Communications by Holder s with Other Holder s.

Holder s may communicate pursuant to TIA § 312(b) with other Holder s with respect to their rights under this Indenture or the Notes . The Issuer , the Guarantor s, the Trustee , the Registrar , each Agent and anyone else shall have the protection of TIA § 312(c).

Section 12.04 Certificate and Opinion as to Conditions Precedent.

Upon any request or application by the Issuer or any Guarantor to the Trustee or the Collateral Agent to take any action under this Indenture and/or the Notes Security Documents , as applicable, such Issuer or such Guarantor , as the case may be, shall furnish to the Trustee or the Collateral Agent , as applicable (except in the case of any such application or request as to which the furnishing of such document is specifically required by any provision of this Indenture relating to such particular application or request, no additional certificate or opinion need be furnished):

(1) an Officer's Certificate (which shall include the statements set forth in Section 12.05 below) stating that, in the opinion of the signers, all conditions precedent and covenants, if any, provided for in this Indenture relating to the proposed action have been complied with; and

(2) an Opinion of Counsel (which shall include the statements set forth in Section 12.05 below) stating that, in the opinion of such counsel, all such conditions precedent and covenants have been complied with.

Section 12.05 Statements Required in Certificate and Opinion.

Each certificate and opinion with respect to compliance by or on behalf of the Issuer or any Guarantor with a condition or covenant provided for in this Indenture (other than a certificate provided pursuant to Section 4.05) and/or the Notes Security Documents, as applicable shall include:

(1) a statement that the Person making such certificate or opinion has read such covenant or condition;

(2) a brief statement as to the nature and scope of the examination or investigation upon which the statements or opinions contained in such certificate or opinion are based;

(3) a statement that, in the opinion of such Person, it or he has made such examination or investigation as is necessary to enable it or him to express an informed opinion as to whether or not such covenant or condition has been complied with (and, in the case of an Opinion of Counsel, may be limited to reliance on an Officer's Certificate as to matters of fact); and

(4) a statement as to whether or not, in the opinion of such Person, such covenant or condition has been complied with.

Section 12.06 Rules by Trustee and Agent s.

The Trustee may make reasonable rules for action by or meetings of Noteholder s. The Registrar and Paying Agent may make reasonable rules for their functions.

Section 12.07 Business Day s; Legal Holiday s.

A "Business Day" is a day that is not a Legal Holiday. A "Legal Holiday" is a Saturday, a Sunday or other day on which commercial banks in The City of New York, the State of New York or at the place of payment in respect of the Notes are not required to be open. If a payment date is a Legal Holiday at a place of payment, payment may be made at that place on the next succeeding day that is not a Legal Holiday, and no interest shall accrue for the intervening period.

Section 12.08 Governing Law; Submission to Jurisdiction.

This Indenture, the Notes and the Note Guarantee s shall be governed by and construed in accordance with the laws of the State of New York. **Each of the parties hereto hereby irrevocably submits to the jurisdiction of any New York State court sitting in the Borough of Manhattan in the City of New York or any federal court sitting in the Borough of Manhattan in the City of New York in respect of any suit, action or proceeding arising out of or relating to this Indenture, any Note Guarantee and the Notes, and irrevocably accepts for itself and in respect of its property, generally and unconditionally, jurisdiction of the aforesaid courts.**

Section 12.09 No Adverse Interpretation of Other Agreements.

This Indenture may not be used to interpret another indenture, loan, security or debt agreement of Holdings, the Issuer or any Subsidiary thereof. No such indenture, loan, security or debt agreement may be used to interpret this Indenture.

Section 12.10 Successors.

All agreements of the Issuer and the Guarantor s in this Indenture and the Notes shall bind their respective successors. All agreements of the Trustee, any additional trustee and any Agent s in this Indenture shall bind its successor.

Section 12.11 Multiple Counterparts.

The parties may sign multiple counterparts of this Indenture. Each signed counterpart shall be deemed an original, but all of them together represent one and the same agreement. The exchange of copies of this Indenture and of signature pages by facsimile or PDF transmission shall constitute effective execution and delivery of this Indenture as to the parties hereto and may be used in lieu of the original Indenture for all purposes. Signatures of the parties hereto transmitted by facsimile or PDF shall be deemed to be their original signatures for all purposes. The words "execution," "signed," "signature," "delivery," and words of like import in or relating to this Indenture or any document to be signed in connection with this Indenture shall be deemed to include electronic signatures and/or DocuSign, deliveries or the keeping of records in electronic form, each of which shall be of the same legal effect, validity or enforceability as a manually executed signature, physical delivery thereof or the use of a paper-based recordkeeping system, as the case may be, and the parties hereto consent to conduct the transactions contemplated hereunder by electronic means.

Section 12.12 Table of Contents, Headings, etc.

The table of contents, cross-reference sheet and headings of the Articles and Sections of this Indenture have been inserted for convenience of reference only, are not to be considered a part hereof, and shall in no way modify or restrict any of the terms or provisions hereof.

Section 12.13 Separability.

Each provision of this Indenture shall be considered separable and if for any reason any provision which is not essential to the effectuation of the basic purpose of this Indenture or the Notes shall be invalid, illegal or unenforceable, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

Section 12.14 Waiver of Jury Trial.

THE ISSUER, THE GUARANTORS, THE TRUSTEE AND THE COLLATERAL AGENT, AND EACH HOLDER OF A NOTE BY ITS ACCEPTANCE THEREOF, IRREVOCABLY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY AND ALL RIGHT TO TRIAL BY JURY IN ANY LEGAL PROCEEDING ARISING OUT OF OR RELATING TO THIS INDENTURE, THE NOTES, THE NOTE GUARANTEES OR ANY TRANSACTION CONTEMPLATED HEREBY.

Section 12.15 Force Majeure.

In no event shall the Trustee or the Collateral Agent be responsible or liable for any failure or delay in the performance of its obligations hereunder arising out of or caused by, directly or indirectly, forces beyond its control, including, without limitation, strikes, work stoppages, accidents, acts of war or terrorism, civil or military disturbances, nuclear or natural catastrophes or acts of God, and interruptions, loss or malfunctions of utilities, communications or computer (software and hardware) services; it being understood that the Trustee or the Collateral Agent shall use reasonable efforts which are consistent with accepted practices in the banking industry to resume performance as soon as practicable under the circumstances

Section 12.16 Trust Indenture Act.

The Issuer and the Guarantors shall not be required to qualify this Indenture under the Trust Indenture Act. Whenever this Indenture refers to a provision of the Trust Indenture Act, the provision is incorporated by reference in and made a part of this Indenture.

The following Trust Indenture Act term used in this Indenture has the following meaning:

"obligor" on the Notes of any series and the Note Guarantee s means the Issuer and the Guarantor s, respectively, and any successor obligor upon the Notes of such series and the Note Guarantee s, respectively.

All other terms used in this Indenture that are defined by the Trust Indenture Act , defined by Trust Indenture Act reference to another statute or defined by the Commission rule under the Trust Indenture Act have the meanings so assigned to them.

Section 12.17 U.S.A. Patriot Act.

The Issuer and the Guarantor s acknowledge that in accordance with Section 326 of the U.S.A. PATRIOT Act, the Trustee , like all financial institutions and in order to help fight the funding of terrorism and money laundering, is required to obtain, verify, and record information that identifies each person or legal entity that establishes a relationship or opens an account with the Trustee . The parties to this Indenture agree that they will provide the Trustee with such information as it may request in order for the Trustee to satisfy the requirements of the U.S.A. PATRIOT Act.

[Signature Pages Follow]

IN WITNESS WHEREOF, the parties have caused this Indenture to be duly executed all as of the date and year first written above.

COOPER-STANDARD AUTOMOTIVE INC.,
as Issuer

By: /s/ Jonathan P. Banas
Name: Jonathan P. Banas
Title: Executive Vice President and Chief Financial Officer

GUARANTORS:

CSA SERVICES INC.
COOPER-STANDARD FHS LLC
COOPER-STANDARD CANADA HOLDINGS LLC
CS INTERMEDIATE HOLDCO 1 LLC

By: /s/ Jonathan P. Banas
Name: Jonathan P. Banas
Title: President

COOPER-STANDARD AUTOMOTIVE NC L.L.C.
COOPER-STANDARD AUTOMOTIVE OH, LLC
COOPER-STANDARD AUTOMOTIVE FLUID
SYSTEMS MEXICO HOLDING LLC
NISCO HOLDING COMPANY

By: /s/ Jonathan P. Banas
Name: Jonathan P. Banas
Title: Vice President

COOPER-STANDARD LATIN AMERICA B.V.

By: /s/ Maarten Van den Berg
Name: Maarten Van den Berg
Title: Attorney

COOPER-STANDARD INDUSTRIAL AND SPECIALTY GROUP, LLC

By: /s/ James Zabriskie
Name: James Zabriskie
Title: Treasurer

U.S. BANK NATIONAL ASSOCIATION, as Trustee and as Collateral Agent

By: /s/ James Kowalski
Name: James Kowalski
Title: Vice President

EXHIBIT A

[FORM OF NOTE]

COOPER-STANDARD AUTOMOTIVE INC.

13.000% SENIOR SECURED NOTE DUE 2024

[Insert Global Note Legend , if applicable]

[Insert Private Placement Legend , if applicable]

[Insert Original Issue Discount Legend , if applicable]

No. [] CUSIP No. []
ISIN No. [] \$[]

COOPER-STANDARD AUTOMOTIVE INC., an Ohio corporation (the "Issuer"), for value received promises to pay to [] [CEDE & CO.] or registered assigns the principal sum [of \$[]][set forth in the Schedule of Exchange s of Interests in Global Note attached hereto] on June 1, 2024.

Interest Payment Date s: June 1 and December 1, commencing on December 1, 2020.

Record Dates: May 15 and November 15 (whether or not a Business Day).

Reference is made to the further provisions of this Note contained herein, which will for all purposes have the same effect as if set forth at this place.

A-1-1

IN WITNESS WHEREOF, the Issuer has caused this Note to be signed manually, by facsimile or electronically (including ".pdf") by its duly authorized officer.

COOPER-STANDARD AUTOMOTIVE INC.

By: _____
Name:
Title:

Dated:

A-1-2

Certificate of Authentication

This is one of the 13.000% Senior Secured Notes due 2024 referred to in the within-mentioned Indenture .

U.S. BANK NATIONAL ASSOCIATION,
as Trustee

By: ____

Dated:

A-1-3

[FORM OF REVERSE OF NOTE]

COOPER-STANDARD AUTOMOTIVE INC.

13.000% SENIOR SECURED NOTE DUE 2024

1. Interest. Cooper-Standard Automotive Inc., an Ohio corporation (the "Issuer"), promises to pay interest on the principal amount set forth on the face hereof at a rate of 13.000% per annum. Interest hereon will accrue from and including the most recent date to which interest has been paid or, if no interest has been paid, from and including May 29, 2020 to but excluding the date on which interest is paid. Interest shall be payable in arrears on each June 1 and December 1, commencing on December 1, 2020, or if any such day is not a Business Day, on the next succeeding Business Day (each, an "Interest Payment Date") and no interest on such payment will accrue in respect of the delay. Interest will be computed on the basis of a 360-day year comprising twelve 30-day months, and in the case of an incomplete month, the number of actual days elapsed. The Issuer shall pay interest on overdue principal and on overdue interest (to the extent lawful) at the rate borne by the Notes.

2. Method of Payment. The Issuer will pay interest hereon (except defaulted interest) to the Person s who are registered Holder s at the close of business on May 15 or November 15, as the case may be, immediately preceding the Interest Payment Date (whether or not a Business Day). Interest may be paid by check mailed to the Holder entitled thereto at the address indicated on the register maintained by the Registrar for the Notes; *provided* that all payments of principal and interest and premium, if any, with respect to the Notes represented by one or more Global Notes will be made in accordance with the Depository's applicable procedures. The Issuer will pay principal and interest in U.S. Dollars. Holder s must surrender Notes to a Paying Agent to collect principal payments.

3. Paying Agent and Registrar. Initially, U.S. Bank National Association (the "Trustee") will act as a Paying Agent and Registrar. The Issuer may change any Paying Agent or Registrar without notice. The Issuer or any of the Restricted Subsidiaries may act as Paying Agent or Registrar.

4. Indenture. The Issuer issued the Notes under an Indenture, dated as of May 29, 2020 (the "Indenture"), among the Issuer, the Guarantor s, the Trustee and the Collateral Agent. This is one of an issue of Notes of the Issuer issued, or to be issued, under the Indenture. The terms of the Notes include those stated in the Indenture. The Notes are subject to all such terms, and Holder s are referred to the Indenture for a statement of them. Capitalized and certain other terms used herein and not otherwise defined have the meanings set forth in the Indenture. To the extent any provision of this Note conflicts with the express provisions of the Indenture, the provisions of the Indenture shall govern and be controlling.

5. Optional Redemption.

At any time prior to June 1, 2022, the Issuer may, at its option, on any one or more occasions redeem up to 35% of the aggregate principal amount of Notes issued under the Indenture, including any Additional Notes issued after the Issue Date, upon not less than 10 nor more than 60 days' notice, at a redemption price equal to 113.000% of the principal amount of the Notes redeemed, with an amount of cash no greater than the cash proceeds (net of underwriting discounts and commissions) of all Equity Offerings to the extent such cash proceeds are received by or contributed to the Issuer since the Issue Date, plus accrued and unpaid interest, if any, to but excluding the applicable Redemption Date; *provided* that:

- (1) at least 65% (calculated without giving effect to any issuance of Additional Notes) of the original aggregate principal amount of Notes issued under the Indenture (excluding Notes held by the Issuer and its Subsidiaries) remains outstanding immediately after the occurrence of such redemption; and
- (2) each such redemption occurs within 120 days of the date of the closing of each such Equity Offering.

In addition, prior to June 1, 2022, the Issuer may, at its option, redeem the Notes on any one or more occasions, in whole or in part, at a redemption price equal to 100% of the principal amount thereof, plus accrued and unpaid interest, if any, to but excluding the Make-Whole Redemption Date, plus the applicable Make-Whole Premium (a "Make-Whole Redemption"). The Issuer shall notify the Trustee of the Make-Whole Premium on or before the applicable Redemption Date, and the Trustee shall have no responsibility for verifying or otherwise for such calculation.

On or after June 1, 2022, the Issuer may, at its option, redeem the Notes on any one or more occasions, in whole or in part, upon not less than 10 nor more than 60 days' notice, at the redemption prices (expressed as percentages of principal amount) set forth below, plus accrued and unpaid interest, if any, on the Notes redeemed to but excluding the applicable Redemption Date, if redeemed during the periods indicated below:

<u>Period</u>	<u>Percentage</u>
June 1, 2022 to May 31, 2023	106.500 %
June 1, 2023 to November 30, 2023	103.250 %
December 1, 2023 and thereafter	100.000 %

Unless the Issuer defaults in the payment of the redemption price, interest will cease to accrue on the Notes or portions thereof called for redemption on the applicable Redemption Date. The Issuer may provide in such notice that payment of the redemption price and performance of the Issuer's obligations with respect to such redemption may be performed by another Person.

Notwithstanding the foregoing, in connection with any tender offer, if Holder s of not less than 90% in aggregate principal amount of the outstanding Notes validly tender and do not withdraw such Notes in such tender offer and the Issuer , or any third party making such tender offer in lieu of the Issuer , purchases all of the Notes validly tendered and not withdrawn by such Holder s, the Issuer or such third party will have the right upon not less than 10 nor more than 60 days' prior notice, given not more than 60 days following the effective date of such tender offer, to redeem (with respect to the Issuer) or purchase (with respect to a third party) all Notes that remain outstanding following such purchase at a price equal to the price offered to each other Holder in such tender offer (which may be less than par and shall exclude any early tender premium and any accrued and unpaid interest paid to any Holder in such tender offer payment) plus, to the extent not included in the tender offer payment, accrued and unpaid interest, if any, thereon, to but excluding the Redemption Date or purchase date, subject to the right of Holder s of record on the relevant record date to receive interest due on the relevant Interest Payment Date falling on or prior to the Redemption Date or purchase date. In determining whether the Holder s of at least 90% of the aggregate principal amount of the then outstanding Notes have validly tendered and not validly withdrawn Notes in a tender offer, Change of Control Offer , Offer or Advance Offer , as applicable, Notes owned by an Affiliate of the Issuer or by funds controlled or managed by an Affiliate of the Issuer , or any successor thereof, shall be deemed to be outstanding for the purposes of such tender offer, Change of Control Offer , Offer or Advance Offer , as applicable.

In addition, the Issuer and its Affiliate s may acquire Notes at any time and from time to time by means other than a redemption, whether by tender offer, open market purchases, negotiated transactions or otherwise, in accordance with applicable securities laws, so long as such acquisition does not otherwise violate the terms of the Indenture .

Notwithstanding the foregoing, the payment of accrued but unpaid interest in connection with any redemption of Notes is subject to the rights of a Holder on a record date for the payment of interest whose Notes are to be redeemed on or after such record date but on or prior to the related Interest Payment Date to receive interest on such Interest Payment Date .

6. Offer s To Purchase. The Indenture provides that upon the occurrence of a Change of Control or an Asset Disposition and subject to further limitations and exceptions contained therein, the Issuer may be required to make an offer to purchase outstanding Notes in accordance with the procedures set forth in the Indenture . Except as set forth in Sections 4.07 and 4.08 of the Indenture , the Issuer is not required to make any mandatory redemption or sinking fund payments with respect to the Notes .

7. Denominations, Transfer , Exchange . The Notes are in registered form without coupons in denominations of \$2,000 and any integral multiple of \$1,000 in excess thereof. A Holder may transfer or exchange Notes in accordance with the Indenture . The Registrar and the Trustee may require a Holder , among other things, to furnish appropriate endorsements and transfer documents and the Issuer or the Trustee may require a Holder to pay to it any taxes and fees required by law or permitted by the Indenture . The Registrar or

the Issuer need not register the transfer of or exchange any Notes or portion of a Note selected for redemption, or register the transfer of or exchange any Notes for a period of 15 days before a selection of Notes to be redeemed.

8. Person s Deemed Owner s. The registered Holder of this Note may be treated as the owner of this Note for all purposes.

9. Unclaimed Money. Subject to applicable escheat laws, if money for the payment of principal or interest remains unclaimed for two years, the Trustee will pay the money back to the Issuer at its written request. After that, Holder s entitled to the money must look to the Issuer and the Guarantor s for payment as general unsecured creditors unless an "abandoned property" law designates another Person .

10. Amendment, Supplement, Waiver, Etc. The Indenture , the Notes or the Note Guarantee s may be amended or supplemented as provided in the Indenture .

11. Restrictive Covenants. The Indenture imposes certain limitations on the ability of the Issuer and its Restricted Subsidiaries to, among other things, consummate Asset Disposition s, Incur Indebtedness or issue shares of Disqualified Stock or Preferred Stock , create or Incur Lien s, make certain Investment s and other Restricted Payment s, enter into consensual restrictions upon the payment of certain dividends and distributions by the Restricted Subsidiaries that are not Guarantor s, enter into or permit certain transactions with Affiliate s or consolidate, merge or sell all or substantially all of the assets of the Issuer and its Restricted Subsidiaries . The Indenture also limits the activities of Parent and Holdings . Such limitations are subject to a number of important qualifications and exceptions. Pursuant to Section 4.05 of the Indenture , the Issuer must annually report to the Trustee on compliance with such limitations.

13. Default s and Remedies. The Events of Default relating to the Notes are defined in Section 6.01 of the Indenture . Upon the occurrence of an Event of Default relating to the Notes , the rights and obligations of the Issuer , the Guarantor s, the Trustee , the Collateral Agent and the Holder s shall be as set forth in the applicable provisions of the Indenture .

14. No Recourse Against Others. No past, present or future director, officer, employee, manager, member, partner, incorporator or stockholder of the Issuer or of any Subsidiary or any Parent Entity (other than the Issuer in respect of the Notes and each Guarantor in respect of its Note Guarantee), as such, shall have any liability for any obligations of the Issuer or the Guarantor s under the Notes , the Indenture , the Notes Security Documents or the Note Guarantee s or for any claim based on, in respect of, or by reason of, such obligations or their creation. Each Holder by accepting a Note waives and releases all such liability.

15. Guarantee s. The Notes will be entitled to the benefits of certain Note Guarantee s made for the benefit of the Holder s. Reference is hereby made to the Indenture

for a statement of the respective rights, limitations of rights, duties and obligations thereunder of the Guarantor s, the Trustee , the Collateral Agent and the Holder s.

17. Security. The Notes shall be secured by Lien s on the Collateral on an equal and ratable basis with any Fixed Asset Obligations , subject to Permitted Lien s , on the terms and conditions set forth in the Indenture and the Notes Security Documents . The Collateral Agent holds a Lien in the Collateral for the benefit of the Trustee and the Holder s, in each case, pursuant to the Notes Security Documents .

18. Authentication. This Note shall not be valid until the Trustee manually, by facsimile or electronically (including ".pdf") signs the certificate of authentication on the other side of this Note.

19. Governing Law. THIS NOTE SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK.

20. Abbreviations. Customary abbreviations may be used in the name of a Holder or an assignee, such as: TEN COM (= tenants in common), TENANT (= tenants by the entireties), JT TEN (= joint tenants with right of survivorship and not as tenants in common), CUST (= Custodian), and U/G/M/A (= Uniform Gifts to Minors Act).

21. CUSIP and ISIN numbers. Pursuant to a recommendation promulgated by the Committee on Uniform Security Identification Procedures, the Issuer has caused CUSIP and ISIN numbers and/or similar numbers to be printed on the Notes and the Trustee may use CUSIP and ISIN numbers and/or similar numbers in notices of redemption as a convenience to Holder s. No representation is made as to the accuracy of such numbers either as printed on the Notes or as contained in any notice of redemption and reliance may be placed only on the other identification numbers placed thereon.

The Issuer shall furnish to any Holder upon written request and without charge a copy of the Indenture . Requests may be made to:

Cooper-Standard Automotive Inc.
40300 Traditions Drive
Northville, Michigan 48168
Attention: Chief Legal Officer
Email: Joanna.Totsky@CooperStandard.com

ASSIGNMENT

I or we assign and transfer this Note to:

(Insert assignee's social security or tax I.D. number)

(Print or type name, address and zip code of assignee)

and irrevocably appoint ____

Agent to transfer this Note on the books of the Issuer . The Agent may substitute another to act for him.

Date: ____ Your Signature: ____

(Sign exactly as your name appears on the other side of this Note)

Signature Guarantee : _____

SIGNATURE GUARANTEE

Signatures must be guaranteed by an "eligible guarantor institution" meeting the requirements of the Registrar , which requirements include membership or participation in the Security Transfer Agent Medallion Program ("STAMP ") or such other "signature guarantee program" as may be determined by the Registrar in addition to, or in substitution for, STAMP , all in accordance with the Securities Exchange Act of 1934, as amended.

OPTION OF HOLDER TO ELECT PURCHASE

If you want to elect to have all or any part of this Note purchased by the Issuer pursuant to Section 4.07 or Section 4.08 of the Indenture , check the appropriate box:

“ Section 4.07 “ Section 4.08

If you want to have only part of the Note purchased by the Issuer pursuant to Section 4.07 or Section 4.08 of the Indenture , state the amount you elect to have purchased:

\$
(\$1,000 or any integral multiple
thereof; provided that the part not
purchased must be at least \$2,000)
Date:___

Your Signature: _____
(Sign exactly as your name appears on the face of this Note)

Signature Guarantee d _____

SIGNATURE GUARANTEE

Signatures must be guaranteed by an "eligible guarantor institution" meeting the requirements of the Registrar , which requirements include membership or participation in the Security Transfer Agent Medallion Program ("STAMP ") or such other "signature guarantee program" as may be determined by the Registrar in addition to, or in substitution for, STAMP , all in accordance with the Securities Exchange Act of 1934, as amended.

SCHEDULE OF EXCHANGES OF INTERESTS IN GLOBAL NOTE*

The following exchanges of a part of this Global Note for an interest in another Global Note or for a Physical Note, or exchanges of a part of another Global Note or Physical Note for an interest in this Global Note, have been made:

<u>Date of Exchange</u>	Amount of decrease in Principal Amount of <u>this Global Note</u>	Amount of increase in Principal Amount of <u>this Global Note</u>	Principal Amount of this Global Note following such decrease (or increase)	Signature of authorized <u>signatory of</u> <u>Trustee</u>
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[FORM OF PRIVATE PLACEMENT LEGEND]

Any Restricted Note authenticated and delivered hereunder shall bear a legend (which would be in addition to any other legends required in the case of a Global Note or a Note issued with original issue discount) in substantially the following form:

THIS SECURITY HAS NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT "), OR THE SECURITIES LAWS OF ANY STATE OR OTHER JURISDICTION. NEITHER THIS SECURITY NOR ANY INTEREST OR PARTICIPATION HEREIN MAY BE REOFFERED, SOLD, ASSIGNED, TRANSFERRED, PLEDGED, ENCUMBERED OR OTHERWISE DISPOSED OF IN THE ABSENCE OF SUCH REGISTRATION OR UNLESS SUCH TRANSACTION IS EXEMPT FROM, OR NOT SUBJECT TO, SUCH REGISTRATION. THE HOLDER OF THIS SECURITY, BY ITS ACCEPTANCE HEREOF, AGREES ON ITS OWN BEHALF AND ON BEHALF OF ANY INVESTOR ACCOUNT FOR WHICH IT HAS PURCHASED SECURITIES, TO OFFER, SELL OR OTHERWISE TRANSFER SUCH SECURITY, PRIOR TO THE DATE (THE "RESALE RESTRICTION TERMINATION DATE ") THAT IS *[IN THE CASE OF RULE 144A NOTES: ONE YEAR AFTER THE LATER OF THE ORIGINAL ISSUE DATE HEREOF, THE ORIGINAL ISSUE DATE OF THE ISSUANCE OF ANY ADDITIONAL NOTES AND THE LAST DATE ON WHICH THE ISSUER OR ANY AFFILIATE OF THE ISSUER WAS THE OWNER OF THIS SECURITY (OR ANY PREDECESSOR OF SUCH SECURITY),]* *[IN THE CASE OF REGULATION S NOTES: 40 DAYS AFTER THE LATER OF THE ORIGINAL ISSUE DATE HEREOF AND THE DATE ON WHICH THIS SECURITY (OR ANY PREDECESSOR OF SUCH SECURITY) WAS FIRST OFFERED TO PERSONS OTHER THAN DISTRIBUTORS (AS DEFINED IN RULE 902 OF REGULATION S) IN RELIANCE ON REGULATION S]*, ONLY (A) TO THE ISSUER OR ANY SUBSIDIARY THEREOF, (B) PURSUANT TO A REGISTRATION STATEMENT THAT HAS BEEN DECLARED EFFECTIVE UNDER THE SECURITIES ACT , (C) FOR SO LONG AS THE SECURITIES ARE ELIGIBLE FOR RESALE PURSUANT TO RULE 144A UNDER THE SECURITIES ACT ("RULE 144A "), TO A PERSON IT REASONABLY BELIEVES IS A "QUALIFIED INSTITUTIONAL BUYER " AS DEFINED IN RULE 144A THAT PURCHASES FOR ITS OWN ACCOUNT OR FOR THE ACCOUNT OF A QUALIFIED INSTITUTIONAL BUYER TO WHOM NOTICE IS GIVEN THAT THE TRANSFER IS BEING MADE IN RELIANCE ON RULE 144A , (D) PURSUANT TO OFFERS AND SALES TO NON-U.S. PERSONS THAT OCCUR OUTSIDE THE UNITED STATES WITHIN THE MEANING OF REGULATION S UNDER THE SECURITIES ACT , OR (E) PURSUANT TO ANOTHER AVAILABLE EXEMPTION FROM THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT , SUBJECT TO THE ISSUER'S AND THE TRUSTEE'S RIGHT PRIOR TO ANY SUCH OFFER, SALE OR TRANSFER PURSUANT TO CLAUSE (D) or (E) TO REQUIRE THE DELIVERY OF AN OPINION OF COUNSEL, CERTIFICATION AND/OR OTHER INFORMATION SATISFACTORY TO EACH OF THEM. *[IN THE CASE OF*

REGULATION S NOTES: BY ITS ACQUISITION HEREOF, THE HOLDER HEREOF REPRESENTS THAT IT IS NOT A U.S. PERSON NOR IS IT PURCHASING FOR THE ACCOUNT OF A U.S. PERSON AND IS ACQUIRING THIS SECURITY IN AN OFFSHORE TRANSACTION IN ACCORDANCE WITH REGULATION S UNDER THE SECURITIES ACT .

BY ITS ACQUISITION OF THIS SECURITY, THE HOLDER THEREOF WILL BE DEEMED TO HAVE REPRESENTED AND WARRANTED THAT EITHER (1) THE HOLDER IS NOT ACQUIRING OR HOLDING THIS SECURITY FOR OR ON BEHALF OF, AND NO PORTION OF THE ASSETS USED BY SUCH HOLDER TO ACQUIRE OR HOLD THIS SECURITY CONSTITUTES THE ASSETS OF AN EMPLOYEE BENEFIT PLAN THAT IS SUBJECT TO TITLE I OF THE U.S. EMPLOYEE RETIREMENT INCOME SECURITY ACT OF 1974, AS AMENDED ("ERISA "), A PLAN, INDIVIDUAL RETIREMENT ACCOUNT OR OTHER ARRANGEMENT THAT IS SUBJECT TO SECTION 4975 OF THE U.S. INTERNAL REVENUE CODE OF 1986, AS AMENDED (THE "CODE ") OR PROVISIONS UNDER ANY OTHER FEDERAL, STATE, LOCAL, NON-U.S. OR OTHER LAWS OR REGULATIONS THAT ARE SIMILAR TO SUCH PROVISIONS OF ERISA OR THE CODE (COLLECTIVELY, "SIMILAR LAWS "), OR OF AN ENTITY WHOSE UNDERLYING ASSETS ARE CONSIDERED TO INCLUDE "PLAN ASSETS" OF ANY SUCH PLAN, ACCOUNT OR ARRANGEMENT, OR (2) THE ACQUISITION, HOLDING AND SUBSEQUENT DISPOSITION OF THIS SECURITY BY THE HOLDER WILL NOT CONSTITUTE A NON-EXEMPT PROHIBITED TRANSACTION UNDER SECTION 406 OF ERISA OR SECTION 4975 OF THE CODE OR A SIMILAR VIOLATION UNDER ANY APPLICABLE SIMILAR LAWS .

EXHIBIT C

[FORM OF LEGEND FOR GLOBAL NOTE]

Any Global Note authenticated and delivered hereunder shall bear a legend (which would be in addition to any other legends required in the case of a Restricted Note or a Note issued with original issue discount) in substantially the following form:

THIS NOTE IS A GLOBAL NOTE WITHIN THE MEANING OF THE INDENTURE HEREINAFTER REFERRED TO AND IS REGISTERED IN THE NAME OF A DEPOSITORY OR A NOMINEE OF A DEPOSITORY. THIS NOTE IS NOT EXCHANGEABLE FOR NOTES REGISTERED IN THE NAME OF A PERSON OTHER THAN THE DEPOSITORY OR ITS NOMINEE EXCEPT IN THE LIMITED CIRCUMSTANCES DESCRIBED IN THE INDENTURE, AND NO TRANSFER OF THIS NOTE (OTHER THAN A TRANSFER OF THIS NOTE AS A WHOLE BY THE DEPOSITORY TO A NOMINEE OF THE DEPOSITORY OR BY A NOMINEE OF THE DEPOSITORY TO THE DEPOSITORY OR ANOTHER NOMINEE OF THE DEPOSITORY) MAY BE REGISTERED EXCEPT IN THE LIMITED CIRCUMSTANCES DESCRIBED IN THE INDENTURE.

UNLESS THIS CERTIFICATE IS PRESENTED BY AN AUTHORIZED REPRESENTATIVE OF THE DEPOSITORY TRUST COMPANY, A NEW YORK CORPORATION ("DTC"), TO THE ISSUER OR ITS AGENT FOR REGISTRATION OF TRANSFER, EXCHANGE, OR PAYMENT, AND ANY CERTIFICATE ISSUED IS REGISTERED IN THE NAME OF CEDE & CO. OR IN SUCH OTHER NAME AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC (AND ANY PAYMENT IS MADE TO CEDE & CO. OR SUCH OTHER ENTITY AS IS REQUESTED BY AN AUTHORIZED REPRESENTATIVE OF DTC), ANY TRANSFER, PLEDGE OR OTHER USE HEREOF FOR VALUE OR OTHERWISE BY OR TO ANY PERSON IS WRONGFUL INASMUCH AS THE REGISTERED OWNER HEREOF, CEDE & CO., HAS AN INTEREST HEREIN.

EXHIBIT D

[FORM OF LEGEND FOR NOTE ISSUED WITH ORIGINAL ISSUE DISCOUNT]

Any Note authenticated and delivered hereunder with original issue discount (within the meaning of Section 1273 of the Code) shall bear a legend (which would be in addition to any other legends required in the case of a Restricted Note or a Global Note) in substantially the following form:

THIS SECURITY HAS BEEN ISSUED WITH "ORIGINAL ISSUE DISCOUNT" (WITHIN THE MEANING OF SECTION 1273 OF THE U.S. INTERNAL REVENUE CODE OF 1986, AS AMENDED). UPON WRITTEN REQUEST, THE ISSUER WILL PROMPTLY MAKE AVAILABLE TO ANY HOLDER OF THIS SECURITY THE FOLLOWING INFORMATION: (1) THE ISSUE PRICE AND ISSUE DATE OF THE SECURITY, (2) THE AMOUNT OF ORIGINAL ISSUE DISCOUNT ON THE SECURITY AND (3) THE YIELD TO MATURITY OF THE SECURITY. HOLDERS SHOULD CONTACT THE ISSUER AT COOPER-STANDARD AUTOMOTIVE INC., 40300 TRADITIONS DRIVE, NORTHVILLE, MI 48168, ATTENTION: INVESTOR RELATIONS.

[FORM OF LEGEND FOR REGULATION S NOTE]

Any Regulation S Note authenticated and delivered hereunder shall bear a legend (which would be in addition to any other legends required in the case of a Restricted Note) in substantially the following form:

BY ITS ACQUISITION HEREOF, THE HOLDER HEREOF REPRESENTS THAT IT IS NOT A U.S. PERSON, NOR IS IT PURCHASING FOR THE ACCOUNT OF A U.S. PERSON, AND IS ACQUIRING THIS NOTE IN AN OFFSHORE TRANSACTION IN ACCORDANCE WITH REGULATION S UNDER THE SECURITIES ACT .

FORM OF CERTIFICATE OF TRANSFER

Cooper-Standard Automotive Inc.
40300 Traditions Drive
Northville, Michigan 48168

U.S. Bank National Association
60 Livingston Avenue, 2nd Floor
St. Paul, MN 55107
Facsimile: (651) 495-8146
Attention: Corporate Trust, DWAC UNIT
re: Cooper-Standard Automotive Inc.

Re: 13.000% Senior Secured Notes due 2024

(CUSIP _____)
(ISIN _____)

Reference is hereby made to the Indenture, dated as of May 29, 2020 (as amended or supplemented from time to time with respect to the Notes, the "Indenture"), by and among Cooper-Standard Automotive Inc. (the "Issuer"), the Guarantors and U.S. Bank National Association, as trustee and collateral agent. Capitalized terms used but not defined herein shall have the meanings given to them in the Indenture.

_____ (the "Transfer or") owns and proposes to transfer the Note[s] or interest in such Note[s] specified in Annex A hereto, in the principal amount of _____ in such Note[s] or interests (the "Transfer"), to _____ (the "Transfer ee"), as further specified in Annex A hereto. In connection with the Transfer, the Transfer or hereby certifies that:

[CHECK ALL THAT APPLY]

1. **Check if Transfer ee will take delivery of a beneficial interest in a Rule 144 A Global Note or a Physical Note pursuant to Rule 144 A.**
The Transfer is being effected pursuant to and in accordance with Rule 144 A under the United States Securities Act of 1933, as amended (the "Securities Act"), and, accordingly, the Transfer or hereby further certifies that the beneficial interest or Physical Note is being transferred to a Person that the Transfer or reasonably believed and believes is purchasing the beneficial interest or Physical Note for its own account, or for one or more accounts with respect to which such Person exercises sole investment discretion, and such Person and each such account is a "qualified institutional buyer" within the meaning of Rule 144 A in a transaction meeting the requirements of Rule

144A and such Transfer is in compliance with any applicable blue sky securities laws of any state of the United States. Upon consummation of the proposed Transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will be subject to the restrictions on transfer enumerated in the Private Placement Legend printed on the Rule 144 A Global Note and/or the Physical Note and in the Indenture and the Securities Act .

2. " **Check if Transfer ee will take delivery of a beneficial interest in a Regulation S Global Note or a Physical Note pursuant to Regulation S** . The Transfer is being effected pursuant to and in accordance with Rule 903 or Rule 904 under the Securities Act and, accordingly, the Transfer or hereby further certifies that (i) the Transfer is not being made to a person in the United States and (x) at the time the buy order was originated, the Transfer ee was outside the United States or such Transfer or and any Person acting on its behalf reasonably believed and believes that the Transfer ee was outside the United States or (y) the transaction was executed in, on or through the facilities of a designated offshore securities market and neither such Transfer or nor any Person acting on its behalf knows that the transaction was prearranged with a buyer in the United States, (ii) no directed selling efforts have been made in contravention of the requirements of Rule 903(b) or Rule 904(b) of Regulation S under the Securities Act , (iii) the transaction is not part of a plan or scheme to evade the registration requirements of the Securities Act and (iv) if the proposed transfer is being made prior to the expiration of the Restricted Period , the transfer is not being made to a U.S. Person or for the account or benefit of a U.S. Person (other than an Initial Purchaser). Upon consummation of the proposed transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will be subject to the restrictions on Transfer enumerated in the Private Placement Legend printed on the Regulation S Global Note and/or the Physical Note and in the Indenture and the Securities Act .

3. " **Check and complete if Transfer ee will take delivery of a beneficial interest in the Global Note or a Physical Note pursuant to any provision of the Securities Act other than Rule 144 A or Regulation S** . The Transfer is being effected in compliance with the transfer restrictions applicable to beneficial interests in Restricted Global Note s and Restricted Physical Note s and pursuant to and in accordance with the Securities Act and any applicable blue sky securities laws of any state of the United States, and accordingly the Transfer or hereby further certifies that (check one):

(a) " such Transfer is being effected pursuant to and in accordance with Rule 144 under the Securities Act ;

or

(b) " such Transfer is being effected to the Issuer or a Subsidiary thereof;

or

(c) " such Transfer is being effected pursuant to an effective registration statement under the Securities Act and in compliance with the prospectus delivery requirements of the Securities Act ;

or

(d) " such Transfer is being effected pursuant to an exemption from the registration requirements of the Securities Act other than Rule 144 A , Rule 144 or Rule 904, and the Transfer or hereby further certifies that it has not engaged in any general solicitation within the meaning of Regulation D under the Securities Act and the Transfer complies with the transfer restrictions applicable to beneficial interests in a Restricted Global Note or Restricted Physical Note s and the requirements of the exemption claimed, which certification is supported by, if such Transfer is in respect of a principal amount of Notes at the time of transfer of less than \$250,000, an Opinion of Counsel provided by the Transfer or or the Transfer ee (a copy of which the Transfer or has attached to this certification), to the effect that such Transfer is in compliance with the Securities Act . Upon consummation of the proposed transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will be subject to the restrictions on transfer enumerated in the Private Placement Legend printed on the Global Note and/or the Physical Notes and in the Indenture and the Securities Act .

4. " **Check if Transfer ee will take delivery of a beneficial interest in an Unrestricted Global Note or an Unrestricted Physical Note .**

(a) " **Check if Transfer is pursuant to Rule 144 .** (i) The Transfer is being effected pursuant to and in accordance with Rule 144 under the Securities Act and in compliance with the transfer restrictions contained in the Indenture and any applicable blue sky securities laws of any state of the United States and (ii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act . Upon consummation of the proposed Transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will no longer be subject to the restrictions on transfer enumerated in the Private Placement Legend printed on the Restricted Global Note s, on Restricted Physical Note s and in the Indenture .

(b) " **Check if Transfer is pursuant to Regulation S .** (i) The Transfer is being effected pursuant to and in accordance with Rule 903 or Rule 904 under the Securities Act and in compliance with the transfer restrictions contained in the Indenture and any applicable blue sky securities laws of any state of the United States and (ii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act . Upon consummation of the proposed Transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will no longer be subject to the restrictions on transfer enumerated in

the Private Placement Legend printed on the Restricted Global Note s, on Restricted Physical Note s and in the Indenture .

(c) " **Check if Transfer is pursuant to Other Exemption.** (i) The Transfer is being effected pursuant to and in compliance with an exemption from the registration requirements of the Securities Act other than Rule 144 , Rule 903 or Rule 904 and in compliance with the transfer restrictions contained in the Indenture and any applicable blue sky securities laws of any State of the United States and (ii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act . Upon consummation of the proposed Transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will not be subject to the restrictions on transfer enumerated in the Private Placement Legend printed on the Restricted Global Note s or Restricted Physical Note s and in the Indenture .

(d) " **Check if Transfer is pursuant to an Effective Registration Statement.** (i) The Transfer is being effected pursuant to and in compliance with an effective registration statement under the Securities Act and any applicable blue sky securities laws of any State of the United States and in compliance with the prospectus delivery requirements of the Securities Act and (ii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act . Upon consummation of the proposed Transfer in accordance with the terms of the Indenture , the transferred beneficial interest or Physical Note will not be subject to the restrictions on transfer enumerated in the Private Placement Legend printed on the Restricted Global Note s or Restricted Physical Note s and in the Indenture .

This certificate and the statements contained herein are made for your benefit and the benefit of the Issuer .

[Insert Name of Transfer or] _____

By:

Name:

Title:

Dated: _____

ANNEX A TO CERTIFICATE OF TRANSFER

1. The Transfer or owns and proposes to transfer the following:

[CHECK ONE]

(a) " a beneficial interest in a:

(i) " Rule 144 A Global Note (CUSIP _____) (ISIN _____), or

(ii) " Regulation S Global Note (CUSIP _____) (ISIN _____), or

(b) " a Restricted Physical Note .

2. After the Transfer the Transfer ee will hold:

[CHECK ONE]

(a) " a beneficial interest in the:

(i) " Rule 144 A Global Note (CUSIP _____) (ISIN _____), or

(ii) " Regulation S Global Note (CUSIP _____)(ISIN _____), or

(iii) " Unrestricted Global Note (CUSIP _____) (ISIN _____), or

(b) " a Restricted Physical Note ; or

(c) " an Unrestricted Physical Note ,

in accordance with the terms of the Indenture .

FORM OF CERTIFICATE OF EXCHANGE

Cooper-Standard Automotive Inc.
40300 Traditions Drive
Northville, Michigan 48168

U.S. Bank National Association
60 Livingston Avenue, 2nd Floor
St. Paul, MN 55107
Facsimile: (651) 495-8146
Attention: Corporate Trust, DWAC UNIT
re: Cooper-Standard Automotive Inc.

Re: 13.000% Senior Secured Notes due 2024

(CUSIP _____)
(ISIN _____)

Reference is hereby made to the Indenture, dated as of May 29, 2020 (as amended or supplemented from time to time with respect to the Notes, the "Indenture"), by and among Cooper-Standard Automotive Inc. (the "Issuer"), the Guarantors and U.S. Bank National Association, as trustee and collateral agent. Capitalized terms used but not defined herein shall have the meanings given to them in the Indenture.

_____ (the "Owner") owns and proposes to exchange the Note[s] or interest in such Note[s] specified herein, in the principal amount of _____ in such Note[s] or interests (the "Exchange"). In connection with the Exchange, the Owner hereby certifies that:

1. Exchange of Restricted Physical Notes or Beneficial Interests in a Restricted Global Note for Unrestricted Physical Notes or Beneficial Interests in an Unrestricted Global Note

(a) " **Check if Exchange is from beneficial interest in a Restricted Global Note to beneficial interest in an Unrestricted Global Note.** In connection with the Exchange of the Owner's beneficial interest in a Restricted Global Note for a beneficial interest in an Unrestricted Global Note in an equal principal amount, the Owner hereby certifies (i) the beneficial interest is being acquired for the Owner's own account without transfer, (ii) such Exchange has been effected in compliance with the transfer restrictions applicable to the Global Notes and pursuant to and in accordance with the United States

Securities Act of 1933, as amended (the "Securities Act"), (iii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act and (iv) the beneficial interest in an Unrestricted Global Note is being acquired in compliance with any applicable blue sky securities laws of any state of the United States.

(b) " **Check if Exchange is from Restricted Physical Note to beneficial interest in an Unrestricted Global Note** . In connection with the Owner 's Exchange of a Restricted Physical Note for a beneficial interest in an Unrestricted Global Note , the Owner hereby certifies (i) the beneficial interest is being acquired for the Owner 's own account without transfer, (ii) such Exchange has been effected in compliance with the transfer restrictions applicable to Restricted Physical Note s and pursuant to and in accordance with the Securities Act , (iii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act and (iv) the beneficial interest is being acquired in compliance with any applicable blue sky securities laws of any state of the United States.

(c) " **Check if Exchange is from Restricted Physical Note to Unrestricted Physical Note** . In connection with the Owner 's Exchange of a Restricted Physical Note for an Unrestricted Physical Note , the Owner hereby certifies (i) the Unrestricted Physical Note is being acquired for the Owner 's own account without transfer, (ii) such Exchange has been effected in compliance with the transfer restrictions applicable to Restricted Physical Note s and pursuant to and in accordance with the Securities Act , (iii) the restrictions on transfer contained in the Indenture and the Private Placement Legend are not required in order to maintain compliance with the Securities Act and (iv) the Unrestricted Physical Note is being acquired in compliance with any applicable blue sky securities laws of any state of the United States.

2. Exchange of Restricted Physical Note s for Restricted Physical Note s or Beneficial Interests in Restricted Global Note s.

(a) " **Check if Exchange is from Restricted Physical Note to beneficial interest in a Restricted Global Note** . In connection with the Exchange of the Owner 's Restricted Physical Note for a beneficial interest in the [CHECK ONE] __ Rule 144 A Global Note , __ Regulation S Global Note with an equal principal amount, the Owner hereby certifies (i) the beneficial interest is being acquired for the Owner 's own account without transfer and (ii) such Exchange has been effected in compliance with the transfer restrictions applicable to the Restricted Global Note s and pursuant to and in accordance with the Securities Act , and in compliance with any applicable blue sky securities laws of any state of the United States. Upon consummation of the proposed Exchange in accordance with the terms of the Indenture , the beneficial interest issued will be subject to the restrictions on transfer enumerated in the Private Placement Legend printed on the relevant Restricted Global Note and in the Indenture and the Securities Act .

This certificate and the statements contained herein are made for your benefit and the benefit of the Issuer .

[Insert Name of Owner] _____

By: _____
Name:
Title:

Dated: _____

EXHIBIT H

[RESERVED]

H-1

EXHIBIT I

[Reserved]

I-1

FORM OF SUPPLEMENTAL INDENTURE
TO BE DELIVERED BY SUBSEQUENT GUARANTORS

SUPPLEMENTAL INDENTURE (this "Supplemental Indenture"), dated as of _____, among _____ (the "Guarantee ing Subsidiary"), a subsidiary of Cooper-Standard Automotive Inc. (or its permitted successor), an Ohio corporation (the "Issuer"), the Issuer, the other Guarantor s (as defined in the Indenture referred to herein) and U.S. Bank National Association, as trustee (the "Trustee") and as collateral agent (the "Collateral Agent") under the Indenture referred to below.

WITNESSETH

WHEREAS, the Issuer, the Guarantor s party thereto, the Trustee and the Collateral Agent are parties to an indenture, dated as of May 29, 2020 (the "Indenture"), providing for the issuance of the Issuer 's 13.000% Senior Secured Notes due 2024 (the "Notes");

WHEREAS, the Indenture provides that under certain circumstances the Guarantee ing Subsidiary shall execute and deliver to the Trustee a supplemental indenture pursuant to which the Guarantee ing Subsidiary shall unconditionally guarantee all of the Issuer 's obligations under the Notes and the Indenture on the terms and conditions set forth herein (the "Note Guarantee"); and

WHEREAS, pursuant to Section 8.01 of the Indenture, the Trustee and Collateral Agent are authorized to execute and deliver this Supplemental Indenture to amend or supplement the Indenture without the consent of any Holder .

NOW, THEREFORE, in consideration of the foregoing and for other good and valuable consideration, the receipt of which is hereby acknowledged, the Guarantee ing Subsidiary and the Trustee mutually covenant and agree for the equal and ratable benefit of the Holder s as follows:

1. CAPITALIZED TERMS. Capitalized terms used herein without definition shall have the meanings assigned to them in the Indenture .
2. AGREEMENT TO GUARANTEE. The Guarantee ing Subsidiary hereby agrees to provide an unconditional Guarantee on the terms and subject to the conditions set forth in the Indenture including but not limited to Article X thereof.
3. EXECUTION AND DELIVERY. The Guarantee ing Subsidiary agrees that the Note Guarantee shall remain in full force and effect notwithstanding the absence of the endorsement of any notation of such Note Guarantee on the Notes .

4. THIS SUPPLEMENTAL INDENTURE SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK.

5. COUNTERPARTS. The parties may sign any number of copies of this Supplemental Indenture . Each signed copy shall be an original, but all of them together represent the same agreement. The words "execution," "signed," "signature," "delivery," and words of like import in or relating to this Supplemental Indenture or any document to be signed in connection with this Supplemental Indenture shall be deemed to include electronic signatures, deliveries or the keeping of records in electronic form, each of which shall be of the same legal effect, validity or enforceability as a manually executed signature, physical delivery thereof or the use of a paper-based recordkeeping system, as the case may be, and the parties hereto consent to conduct the transactions contemplated hereunder by electronic means.

6. EFFECT OF HEADINGS. The Section headings herein are for convenience only and shall not affect the construction hereof.

7. THE TRUSTEE AND THE COLLATERAL AGENT. Neither the Trustee nor the Collateral Agent shall be responsible in any manner whatsoever for or in respect of the validity or sufficiency of this Supplemental Indenture or for or in respect of the recitals contained herein, all of which recitals are made solely by the Guarantee ing Subsidiary and the Issuer .

IN WITNESS WHEREOF, the parties hereto have caused this Supplemental Indenture to be duly executed and attested, all as of the date first above written.

Dated: _____

[GUARANTEEING SUBSIDIARY]

By: _____
Name:
Title:
COOPER-STANDARD AUTOMOTIVE INC.

By: _____
Name:
Title:
[EXISTING GUARANTORS]

By: _____
Name:
Title:
U.S. BANK NATIONAL ASSOCIATION,
as Trustee and as Collateral Agent

By: _____
Name:
Title:

Edward Altman Public Lecture: “50 Years of Altman Z-Score” in Video Format

This exhibit be provided to the Court and the parties separately to accommodate the video format.