An Empirical Analysis of the Effect of Financial Distress on Trade Credit

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This paper studies the use of supplier's trade credit by firms in financial distress. Trade credit represents a large portion of firms' short-term financing and plays an important role in financial distress. We find that firms in financial distress use a significantly larger amount of trade credit to substitute for alternative sources of financing. Firms that are smaller, with less market power, and with more unique products tend to use more trade credit financing when in distress. We also find that firms that significantly increase their trade payables when in financial distress, experience an additional drop of at least 11% in sales and profitability growth over the previously documented 21% average drop for financially troubled firms.

When firms enter financial distress, their ability to raise financing is severely curtailed as the fear of default prevents investors from extending additional financing. Trade credit, the financing provided by suppliers in commercial transactions, is a usual source of short-term financing and is largely employed by corporations.[1] Previous research has indicated that trade credit substitutes for financial credit when the latter is unavailable. Meltzer (1960) reports that trade credit increases under tight monetary conditions, while Petersen and Rajan (1997) find an increase in the use of trade credit by smaller firms with weaker banking relations. Love, Preve, and Sarria-Allende (2007) determine that trade credit increases during widespread economic financial crises. Interestingly enough, however, the literature states that firms in financial distress are likely to experience problems with their suppliers. Baxter (1967) indicates that financially distressed firms may have difficulty obtaining trade credit. Altman (1984) finds that suppliers may be reluctant to sell their products to distressed firms "except under fairly significant restrictions and higher costs, e.g. cash on delivery." Andrade and Kaplan (1998) report that one-third of the distressed firms in their sample reported difficulties with their suppliers.[2] None of these papers, however, quantifies the effect of financial distress on trade credit.

In this paper, we seek to: 1) analyze the effect of financial distress on the use of trade credit as a substitute for alternative sources of financing, 2) quantify the effect of increasing the use of

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[1] In 1994, there was $1.94 in trade credit for each $1 in short-term debt in the US economy. Moreover, De Blasio (2005) reports that Italy employs a greater use of trade credit, representing 25% of Italian firms' assets.

[2] The business press also discusses this issue. Kimberley Blanton's article in *The Boston Globe* on Thursday, December 4, 1997 (City Edition) cites: ". . . the Chapter 11 filing in US Bankruptcy Court in Boston by Waltham-based Molten Metal was triggered when suppliers refused to extend additional credit to the company, which had already slowed payment of its bills." [Copyright 1997 – Globe Newspaper Company – The Boston Globe – December 4, 1997, Thursday, City Edition].

trade credit on the costs of financial distress, and 3) study the firms' characteristics that increase the probability of additional use of trade credit when encountering financial distress.

Our results suggest that firms in financial distress use a significantly larger amount of trade credit than healthy ones. This result is robust to different specifications. To increase our understanding regarding the role of trade credit in financial distress, we investigate whether there is a substitution of trade credit for other sources of financing. More specifically, we measure trade credit as a part of the firm's asset financing and study its effects relative to equity and financial debt when firms enter financial distress. We determine that, in general, firms in financial distress substitute financial debt and equity with supplier's trade credit, consistent with Atanasova (2007) who finds that credit constrained firms tend to use more trade credit to replace bank credit.

We also measure the effect of greater use of trade credit financing on the performance of firms in financial distress. Given that trade credit is an expensive source of financing, we expect firms in financial distress, using more trade credit to finance their operations, to show an additional drop in performance reflecting this higher cost.[3] Our results confirm the weaker performance of firms in financial distress documented in the literature, but they also demonstrate a significantly larger drop in performance when the firm significantly increases its use of trade credit as a source of financing (Altman, 1984; Opler and Titman, 1994; Andrade and Kaplan, 1998). A firm that experiences financial distress will have a drop in operating income of 28% (a drop in sales of 21%), but if the firm increases its trade credit financing by an amount larger than the 95th percentile of the sample, operating income will drop an additional 11% (sales will drop an extra 14%). The results obtained using stock returns, as a measure of performance, are also consistent. In other words, increases in trade credit account for more than one-third of the drop in performance of firms in financial distress. These results complement the ones presented by Molina and Preve (2009) that measured the effect on performance for firms that decrease the use of trade receivables in financial distress.

In addition, we provide evidence to identify whether the increase in trade credit observed for firms in financial distress is due to an increase in the offer of credit from suppliers or to an increase in the demand of credit from the distressed firm. More specifically, we investigate the cross-sectional differences of the effects of financial distress on trade credit using the theoretical framework provided by the theories of trade credit. Schwartz (1974), Emery (1984), Smith (1987), Biais and Gollier (1997), Frank and Maksimovic (2005), and Cuñat (2007) find that firms with better access to financial credit will utilize it instead of the more expensive trade credit. Burkart and Ellingsen (2004) suggest that suppliers increase trade credit financing to their clients because the goods they sell, being less deployable than cash, constitute better collateral. Biais and Gollier (1997) and Smith (1987) posit the asymmetry in the cost of assessing buyers' creditworthiness as an explanation for the existence of trade credit. Suppliers are in a better position than financial creditors to assess the creditworthiness of more obscure or unique firms.

We examine these issues by separating firms according to several characteristics that act as a proxy to these theories of trade credit. We first split the sample according to firm size that acts as a proxy for the quality of management, corporate governance, the quality of reported information, opaqueness, and access to financial credit. In addition, we use a subsample of retail firms as they commercialize easily deployable finished goods that are quickly converted into cash and cannot be repossessed by the suppliers. Consistent with previous arguments, we find that the impact of financial distress on trade credit is significantly and economically less important for larger firms. Moreover, for retailers, these firms are less likely to substitute financial debt for trade credit.

[3] A usual condition reported in the literature is 2/10 net 30, whose annual cost exceeds 40% (Wilner, 2000; Ng, Smith, and Smith, 1999).

These results suggest that firms will tend to use financial credit whenever possible and use trade credit when other sources of financing are unavailable implying that trade credit ranks lower than other traditional sources of financing in the pecking order of financing choices. Furthermore, these results imply that an increase in trade credit in financial distress is not a first-best solution. Rather, firms in financial distress choose it as a less than optimal solution that might have an important associated cost.

Our paper contributes to the literature that examines how financial distress affects the decisions of firms by examining the impact of their use of supplier's credit.[4] We also explicitly provide an estimate for the cost of increasing the use of trade credit financing when firms face financial distress that aids in understanding its associated costs. In addition, our paper contributes to the trade credit literature by providing empirical evidence for some of the theories of trade credit in a situation where the client is in financial distress.

The remainder of the paper proceeds as follows. Section I presents the data and provides selected summary statistics. Section II discusses the effects of financial distress on trade credit. Section III analyzes the costs derived from using more trade credit financing in financial distress, while Section IV studies the cross sectional variations of the use of trade credit in financial distress. Finally, Section V presents our conclusions and the implications of these results, along with some ideas for future research.

I. Data

The sample considers firms in Compustat for which trade credit data is available from 1978 to 2000. We drop all firms with net sales lower than $1 million and firms that do not report positive cost of goods sold. We also discard all companies in the banking, insurance, real estate, and trading industries (standard industrial classifications [SICs] between 6000 and 6999) and the nonclassifiable establishments (SICs between 9995 and 9999).[5] The total number of firm-year observations for which our dependent variable is present from 1978 to 2000 is around 120,000. Missing observations in other variables diminish the number of observations in our regressions. We have been conservative in our approach to removing outliers so we do not affect the evidence of firms in financial distress. We eliminated only the most extreme observations in each variable.[6] Table I presents some selected descriptive statistics of our data set reporting the mean, standard deviation, and the 25th, 50th, and 75th percentiles of the main variables used throughout the paper.

II. The Effect of Financial Distress on Trade Credit Financing

In this section, we analyze the behavior of trade credit when firms enter financial distress. We estimate the following model:

$$(\text{TPay/CGS})_{it} = \alpha_i + \beta \text{ financial distress}_{it-1+\gamma} X_{it} + \varepsilon_{it}. \quad (1)$$

[4] For a complete literature review regarding the financial distress literature, see Senbet and Seward (1995).

[5] The financial industries eliminated correspond to SIC codes between 6000 and 6999, and 9995 and 9999, and Fama and French (1997) industry numbers 44, 45, 46, and 47. For Fama and French's (1997) 48-industry classification see: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/.

[6] We alternatively followed Hadi's (1992, 1994) method to treat our outliers with no change in our results.

Table I. Summary Statistic

The sample consists of 85,727 firm-year observations in the base case that includes firms from Compustat that have trade payables data available from 1978 to 2000. The data excludes SICs 6,000-6,999 and 9,995-9,999. Net Sales and Total Assets are in US$ millions. Trade Credit on Cost of Goods Sold is the ratio of trade payables on the daily cost of goods sold, measured in days. Trade Receivables on Sales is the ratio of trade receivables over daily sales and is measured in days. Trade Credit on Total Assets is the ratio of trade payables to total assets. Financial Distress$_{t-1}$ is a dummy variable equal to one if the firm is in distress at $t-1$ according to the Asquith et al.'s (1994) definition. Financial Leverage is the ratio of the book value of total debt to the book value of debt plus the book value of equity. The book value of equity is equal to Total Assets – Total Liabilities – Preferred Stocks + Deferred Taxes + Convertible Debt. Sales Growth is the growth of sales. Years in Financial Distress counts the number of years that a firm is in distress, and is measured only in those cases in which a firm enters distress at some point in time during the time span of the research period.

	Mean	Percentile 25	Percentile 50	Percentile 75	Standard Deviation
Net sales (MM US$)	1,388.09	43.10	143.76	610.45	6,251.34
Total assets (MM US$)	1,536.51	39.81	127.77	581.80	7,266.12
Trade credit on CGS (days)	55.26	25.20	38.60	59.44	69.45
Trade receivables on sales (days)	59.27	35.12	53.81	74.30	45.67
Trade credit on total assets	0.10	0.04	0.08	0.12	0.08
Financial distress$_{t-1}$	0.11	0.00	0.00	0.00	0.32
Financial leverage	0.25	0.09	0.24	0.38	0.19
Sales growth	0.25	0.01	0.11	0.25	1.27
Years in financial distress	0.57	0.00	0.00	1.00	1.18

TPay/CGS is the ratio of trade payables to cost of goods sold, measured in days, and defined as: TPay/CGS = (trade payables/cost of goods sold) $\times$ 360. α_i is a vector of dummy variables, financial distress is a dummy variable equal to one if the firm is in financial distress in a particular year, and zero otherwise, and X is a matrix of controls.

We define financial distress with the measure used by Asquith, Gertner, and Sharfstein (1994) based on a coverage ratio. A firm is considered to be in financial distress if its coverage ratio (defined as earnings before interest, taxes, depreciations and amortization (EBITDA)/interest expenses) is less than one for two consecutive years or if it is below 0.8 in any given year. Firms in financial distress are identified with the dummy variable defined above. To allow financial distress to have effects on trade credit, we use the first lag of the dummy variable.[7]

Our model includes a matrix of control variables. We use control variables for size and sales growth. Larger firms and firms that are in industries in which they can choose among a large number of clients are likely to enforce their market power in a trade relation and enjoy a bargaining advantage (Wilner, 2000). Firms that experience a sharp increase or decrease in sales for exogenous reasons may experience a change in their trade payables. They may be perceived as a rapidly growing client by the suppliers and this might induce a positive bias in their incentives

[7] As in Molina and Preve (2009), we test alternative definitions of financial distress. Specifically, we use a definition that classifies a firm in financial distress if Financial Distress = 1 and the firm is in the two top deciles of leverage for its industry in that year. This definition is more likely to capture firms in distress because of high leverage. Additionally, we identify those firms classified in default according to the rating measures of Standard & Poors (S&P). Re-running Equation (1) under these alternative definitions of distress does not affect the results (results available upon request).

to offer more trade credit, or the opposite may be true in the case of steep declines in sales. We use the log of Assets or the Log of Sales as size controls. We define sales growth as $(\text{Sales}_t - \text{Sales}_{t-1})/\text{Sales}_{t-1}$.

We estimate Equation (1) using both fixed effects and pooled ordinary least squares (OLS) models.[8] The results are available in Table II, Panel A. Column (1) reports the results for the fixed effects model. The coefficient on the dummy variable for firms in financial distress is positive and significant, implying that financially distressed firms use, on average, 5.2 more days to repay their trade payables than when they were not in financial distress. We also notice that growing firms tend to use more days to repay their suppliers, consistent with our prior expectations. In Column (2), we include, as additional controls, the number of years the firm spends in financial distress and its squared value. The results in Column (2) suggest that financing to firms in financial distress grows during the time in distress. Every additional year that the firm stays in financial distress, tends to further slow its payments to suppliers.

Columns (3) and (4) of Panel A, repeat the analysis of the first two columns using a pooled OLS model. In this model, the results are even stronger. The positive coefficient for the financial distress dummy suggests that firms in financial distress use, on average, 17.5 extra days of trade credit from suppliers than firms with no financial problems. Under this alternative specification, every year in distress adds extra trade credit, but this effect weakens with time in distress.

Note that we scale trade payables by cost of goods sold (CGS). The usual choices to scale this variable in the literature are CGS or total assets. Under normal business conditions, both measures are adequate and derive similar results. In the case of firms entering financial distress, however, we prefer to use CGS instead of assets. The main reason for this choice is that trade payables are generated by CGS and not by assets. Trade payables are generated by the firm's purchases on credit to suppliers, which are typically unobservable in large databases and usually replaced by CGS as a proxy. When a firm enters financial distress, in some cases, it faces a decrease in sales, purchases, and CGS that generates a decrease in trade payables. This mechanical correlation is what we capture with our choice of dependent variable. Alternatively, asset behavior in financial distress is less predictable. Some firms might sell assets, while others may elect to retain them. In any case, CGS and total assets for firms in our sample do not change significantly around the financial distress event alleviating any concern regarding our dependent variable construction.

The results in Panel A are not implying that suppliers voluntarily offer to extend longer terms of trade credit to financially distressed clients. The evidence suggests that whether the supplier offers additional days to pay the bill or the client "stretches" the payments, the days taken to repay suppliers increase for financially distressed clients. This result is consistent with the findings in Hill, Kelly, and Highfield (2010) who report that firms in financial distress tend to be more aggressive in their working capital management, collecting faster from clients, keeping less inventory, and stretching payments to suppliers. An alternative possible interpretation of the results in this panel is that it could be the case that firms in financial distress accumulate debt with suppliers by just not paying them anymore. This, in turn, may cause the supplier to stop supplying them as a response. We only use short-term payables in our definition of trade payables excluding long-term payables and payables under litigation for late payment. One can argue that the results are caused by a mechanical decrease of sales and the cost of goods sold (the denominator) in

[8] The pooled OLS model includes Fama and French (1997) industry dummies and year dummies. The standard errors in these models are White's (1980) heteroskedasticity-consistent, and are clustered by firm in the pooled OLS model to allow for an unspecified correlation between observations of the same firm in different years.

Table II. Trade Credit and Financial Distress

This table reports regressions of trade credit on a financial distress dummy and controls for different specifications. In Panel A, we test the effect of financial distress on trade credit. The dependent variable is the ratio of Trade Payables to the Daily Cost of Goods Sold (TPay/CGS) interpreted as a measure of days of financing received from suppliers. The financial distress dummy (Financial Distress$_{t-1}$) is equal to one if the firm is in distress at $t-1$ according to the Asquith et al.'s (1994) definition. Years in Financial Distress counts how many years the firm has spent in financial distress. We consider it in linear and quadratic terms. Sales Growth measures the first difference in sales scaled by sales. Log Assets and Log Sales are the natural log of total assets and sales, respectively. In Panel B, we test the substitution effect between trade credit and other alternative sources of financing. The dependent variables are: 1) TPay/A that measures the trade credit scaled by assets, 2) TPay/E that measures trade credit on the book value of equity, and 3) TPay/FD that measures trade credit on the book value of financial debt. The sample is the full sample from Compustat from 1980 to 2000. Regressions in Columns [1], [2], [5], [7], and [9] consider firm fixed effects. Regressions in Columns [3], [4], [6], [8], and [10] are Pooled OLS models clustered by firms, including Fama and French (1997) industry dummies. All regressions include a constant; coefficients are not reported to save space. Absolute t-values are in parentheses below each coefficient.

	Panel A. Testing the Effect of Financial Distress on Trade Credit				Panel B. Testing Substitution between Trade Credit and Other Sources of Financing					
	[1] TPay/CGS	[2] TPay/CGS	[3] TPay/CGS	[4] TPay/CGS	[5] TPay/A	[6] TPay/A	[7] TPay/E	[8] TPay/E	[9] TPay/FD	[10] TPay/FD
Financial distress$_{t-1}$	5.21***	3.71***	17.48***	10.55***	0.01***	0.02***	0.15***	0.24***	0.01***	0.01***
	(12.74)	(8.14)	(20.95)	(13.70)	(16.38)	(15.92)	(27.44)	(24.49)	(8.48)	(9.91)
Sales growth	2.05***	2.47***	8.48***	9.54***	0.01***	0.01***	0.01*	0.01	0.01**	0.01
	(5.63)	(6.68)	(11.05)	(12.34)	(25.07)	(7.27)	(1.91)	(0.62)	(1.99)	(0.68)
Years in financial distress		1.16***		5.33***						
		(4.36)		(9.58)						
Years in financial distress^2		0.05		−0.40***						
		(1.51)		(4.86)						
Log assets			0.25	0.40*						
			(1.16)	(1.81)						
Log sales						0.01**		0.02***		−0.01***
						(2.56)		(11.15)		(45.32)

(Continued)

Table II. Trade Credit and Financial Distress (*Continued*)

	Panel A. Testing the effect of Financial Distress on Trade Credit				Panel B. Testing Substitution between Trade Credit and other sources of financing					
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Observations	85,727	85,727	85,727	85,727	86,335	86,335	85,409	85,409	76,308	76,308
R-squared	0.70	0.70	0.15	0.15	0.78	0.16	0.55	0.07	0.65	0.20
Adj. R^2	0.66	0.66	0.15	0.15	0.74	0.16	0.47	0.07	0.59	0.20
N firms			12,018	12,018		12,080		11,951		11,156
Model	F. Effects	F. Effects	P. OLS	P. OLS	F. Effects	P. OLS	F. Effects	P. OLS	F. Effects	P. OLS
Subsample	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full
Dummies	Firms	Firms	Industries	Industries	Firms	Industries	Firms	Industries	Firms	Industries
Clustering			Firms	Firms		Firms		Firms		Firms

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

financial distress. This is not likely to be the case as trade credit (our numerator) is also generated by sales, so the potential mechanical effect is absorbed by the model.[9]

Under the US law, firms in Chapter 11 are allowed to obtain debtor in possession financing (DIP) from financial institutions. This gives new financial debtors special seniority in case of liquidation, similar to the one obtained by the suppliers. The existence of DIP could mitigate our results as it is possible that several of the firms in the sample enter Chapter 11 while they are categorized as in financial distress during the time of our study, obtain DIP, and replace trade credit by special financial credit. This is not a major concern, however, since the effect produced by DIP financing is opposite of our results.

We run several robustness checks on this model. First, we restrict the sample of distressed firms by dropping those who stay in financial distress for more than five years. In addition, since firms may enter into financial distress more than once, we classify firms according to the number of times they enter financial distress during the sample time. We estimate Equation (1) on several restricted samples: 1) firms that do not stay in financial distress more than five years, 2) firms that entered financial distress only once, 3) twice, 4) three, and 5) four times. The results (not reported, but available upon request) do not demonstrate significant differences from the ones reported in our paper.

After Meltzer (1960) demonstrated that under a stricter monetary policy, trade credit increases in the economy, one might wonder whether there are differences in the behavior of distressed firms in financial distress during different time frames. To address this point, we re-run Equation (1) using year dummies. Moreover, we partition the sample into two subsamples covering the periods 1980-1990 and 1991-2000. In addition, we run the pooled OLS on Equation (1) on each individual year of the sample. The results, though not reported in the paper, but available upon request, suggest that the supplier's support of firms in financial distress was not a matter of a single period of time, but was steady and present throughout the sample period.

The results in Panel A confirm that firms in distress use more trade credit from suppliers. This model, however, is unable to explain whether firms in financial distress increase their use of trade credit to substitute for other sources of capital that are unavailable to them in their current financial situation. To specifically address this point, we build three new variables that we use as the dependent variable. We scale trade payables on total assets and construct a variable called TPay/A (i.e., trade payables/total assets). Similarly, we scale trade payables on the book value of equity and on total financial debt and construct TPay/E (i.e., trade payables/book value of equity), and TPay/FD (i.e., trade payables/total financial debt), respectively.[10]

The results are reported in Table II Panel B. Columns (6) and (7) present the results using TPay/A as the dependent variable with fixed effects and pooled OLS models, respectively. The positive coefficients for the financial distress dummy indicate that firms in financial distress increase the use of trade payables in their capital structure. More specifically, firms in financial distress increase trade credit in their capital structure by almost 1% more than when they were financially stable (i.e., in the fixed effects model) and by more than 2% when compared to other nondistressed firms (i.e., in the pooled OLS). Note that this is a relative increase since it is measured relative to other sources of financing. Therefore, it is meaningful even though firms

[9] Note that by scaling trade payables on the cost of goods sold, we are taking into account the level of the sales that generate the trade payables (through the cost of goods sold). This specification rules out by construction the possibility of capturing old payables of firms that are no longer operating.

[10] The use of TPay/A as the dependent variable serves as a robustness check to our original model. One may argue that our dependent variable in the base case (TPay/CGS) might be biased in financial distress since firms might sell less, decreasing the CGS and resulting in a mechanically higher coefficient of trade credit. The fact that our results hold even when Trade Payables is scaled by Assets is reassuring.

in financial distress have been known to participate in the fire sale of assets as noted by Pulvino (1998), among others.

In Columns (7) and (8), we use TPay/E as the dependent variable to allow for the measurement of the substitution effect of trade credit with respect to equity. The positive and significant coefficients on the financial distress dummy suggest that the level of trade payables increases faster than the book value of equity in financially distressed firms. One possible explanation for this result is that firms in financial distress incur losses that diminish the book value of equity. In that case, the ratio tends to rise. The results demonstrate, however, that the level of trade credit does not decrease at the same speed, resulting in an increase in trade credit relative to equity in the firm's capital structure.

Finally, in Columns (9) and (10) of the panel, we consider the substitution effect between trade payables and financial debt by using TPay/FD as the dependent variable in the model. The results are similar to those reported in the first four columns of the table. The positive coefficient on the dummy identifying firms in financial distress suggests that financial debt is replaced by trade payables in the financially distressed firm's capital structure. This is fully consistent with the intuition of this paper and confirms the findings in Atanasova (2007), using a different analytical framework. We define financial debt as the sum of the book value of short-term and long-term debt. Unfortunately, the data are not detailed enough to allow a more comprehensive study of the substitution between suppliers and banks for firms in distress, but is enough to allow us to be confident that, on average, firms in financial distress use suppliers' credit to replace other forms of financing. In sum, the results in Panel B provide support for the hypothesis that trade credit acts as a substitute for the other sources of financing for firms in financial distress.

III. The Cost of Increasing Trade Credit Financing

We now estimate the cost of increasing trade credit financing for firms in financial distress. It has been argued that trade credit is an expensive source of financing. The implied annual cost in the typical "2-10 Net 30" commercial condition is above 40%.[11] If financially distressed firms use this more expensive source of financing, it is likely that they will experience some drop in performance. In this section, we empirically estimate this effect. Specifically, we look at how much of the drop in performance by firms in financial distress is caused by the increase in trade payables financing.

To empirically estimate the cost of increasing trade payables when firms are in financial distress, we regress proxies for firm performance on a dummy for financial distress, a dummy for significant increases in trade payables, and their cross effect. The cross effect of the two dummies (financial distress and the significant rise in the use of trade payables) measures the marginal effect of a rise in trade credit financing on the performance of a firm in financial distress. Quantifying this marginal effect allows us to measure the cost of financial distress caused by an increase in the use of trade credit.

We borrow the following model for firm performance from Opler and Titman (1994):

$$\begin{aligned}\text{Performance}_{i,t-2\to t} = {} & \delta + \beta_1 \text{financial distress}_{i,t-1} + \beta_2 (\text{increase TPay/CGS})_{i,t-2\to t} \\ & + \beta_3((\text{increase TPay/CGS})_{i,t-2\to t}{}^{*}\text{financial distress}_{i,t-1}) + \gamma X_{i,t-2} + \varepsilon_{it}.\end{aligned} \tag{2}$$

[11] See Wilner (2000) and Ng et al. (1999) for a more detailed explanation. Two recent papers cast some doubt regarding this higher cost. Giannetti, Burkart, and Ellingsen (2010) find that several of the firms in their sample seem to be receiving cheap trade credit, and Miwa and Ramseyer (2008), using data from Japanese firms in the 1960s, report that trade credit and bank credit have about the same cost.

We consider three different proxies for firm performance (Performance$_{i,t-2\to t}$) adjusted by industry medians, and use four control variables ($X_{i,t-2}$). Firm performance is measured over a two-year period, from $t-2$ to t, and the controls are measured at $t-2$.

To measure financial distress, we use the first lag (at $t-1$) of the dummy measuring financial distress as in the previous section. We measure the increase in trade credit financing by creating a dummy that is equal to one if the firm exhibits a significant increase in trade payables, normalized by the cost of goods sold and measured in days (increaseTpay/CGS)$_{i,t-2\to t}$.

We consider an increase to be significant if the firm raises its use of trade payables by an amount that is larger than the 95th percentile in its industry. Alternatively, we also use the 90th percentile. Because we can expect different increases for firms in different industries, we measure the rise in trade payables by comparing it to trade payables variations of firms in the same industry. We also compute the percentiles using the entire sample as a robustness check. To be consistent with the timing of the other variables, we measure the rise in trade payables in the same two-year period that we use for firm performance (from $t-2$ to t). The cross effect of the rise in trade payables and financial distress measures the additional effect on firm performance. This setup is also used in Molina and Preve (2009).

The results are reported in Table III. Note that we have fewer observations than in the previous tables because, following Opler and Titman (1994), we limit ourselves to industries with at least four firms to carry the necessary industry adjustments. We also drop firms with sales growth, operating income growth, or equity returns in excess of 200%. In addition, we lose one year of data as we need two lags to build the performance variables in these regressions. The reported regressions include firm fixed effects.

We find that while all firms in financial distress experience drops in performance (the coefficients on the financial distress dummy are negative and significant in all regressions), this drop is significantly larger when there is an important increase in trade credit financing. In fact, the sum of the coefficients on the increase in the trade payables dummy and the interaction term is negative in all cases. This result is consistent through different measures of performance, and it is also robust to considering the significance of the rise in trade payables with respect to the entire sample, rather than only to the firm's respective industry (results not reported). The magnitude of the effect of a rise in trade payables on firm performance is economically important.

A firm that experiences financial distress will have a drop in operating income of 28%. If this firm also increases its trade payables by an amount larger than the 95th percentile (90th percentile) of the firm's industry, its operating income will drop by an additional 11% (9%).[12] Similarly, when we measure performance with the sales growth or with stock returns, we observe a drop of 21% and 61% in performance for firms in financial distress, with an additional drop of 14% and 23%, respectively, when the firm in distress increases its use of trade payables financing to the 95th industry percentile (9% and 15% when they increase the use of trade credit to the 90% of the industry percentile). These results are comparable with those in Opler and Titman (1994). Overall, we find that a firm that is in financial distress and significantly increases their trade payables reports a total drop in operating income, sales, and stock returns of up to 39%, 35%, and 84%, respectively.[13] Our results suggest that about one-third of this drop in performance is due to the increase in trade credit financing, which supports the importance of trade credit management for firms in financial trouble.

[12] To obtain these percentages, we need to add the coefficients in the dummy that identifies firms that significantly increase trade credit and the interaction term (with financial distress).

[13] If we increase the use of trade credit above 90% of the industry percentile, these numbers change to 37%, 30% and 76%, respectively.

Table III. Cost of Increasing Trade Credit when Firms are in Financial Distress

This table presents firm fixed effects regressions of firm performance on a financial distress dummy, a dummy for increase in Trade Credit, and their cross effects. The dependent variables are measured as in Opler and Titman (1994). Operating income growth, stock returns, and sales growth are industry-adjusted and measured over the two-year period from $t-2$ to t. The industry adjustment is carried out by subtracting the Fama and French (1997) industry median from the firm's performance. The independent variables include four controls taken from Opler and Titman (1994), which are also industry-adjusted and measured at $t-2$. The financial distress dummy (financial distress$_{t-1}$) is equal to one if the firm is in distress at $t-1$ according to the Asquith et al.'s (1994) definition. To measure a significant increase in trade credit, we use the ratio of trade payables to cost of goods sold (TPay/CGS). The dummy for increase in the trade payables is equal to one if the variation in the ratio of trade payables to cost of goods sold, from $t-2$ to t, is higher than the 90th percentile in Columns [1], [3], and [5], and higher than the 95th percentile in Columns [2], [4], and [6]. We measure the Trade Payables increases by their respective percentiles within industries. The last row reports the cross effect of the dummy for financial distress times the dummy for increase in TPay/CGS. All regressions include a constant, whose coefficients are not reported to save space. Absolute t-values are in parentheses below each coefficient.

	[1] Ind. Adj. Operating Income Growth ($t/t-2$)	[2] Ind. Adj. Operating Income Growth ($t/t-2$)	[3] Ind. Adj. Sales Growth ($t/t-2$)	[4] Ind. Adj. Sales Growth ($t/t-2$)	[5] Ind. Adj. Stock Return ($t/t-2$)	[6] Ind. Adj. Stock Return ($t/t-2$)
Lg(Sales)$_{t-2}$	−0.18***	−0.18***	−0.23***	−0.23***	−0.37***	−0.37***
	(34.48)	(34.49)	(81.48)	(81.51)	(13.96)	(13.95)
EBITDA/TA$_{t-2}$ Ind. Adj.	−0.58***	−0.58***	−0.16***	−0.16***	−4.99***	−4.99***
	(14.56)	(14.53)	(8.16)	(8.18)	(25.85)	(25.84)
Inv/TA$_{t-2}$ Ind. Adj.	−0.02	−0.02	0.10***	0.10***	−1.32***	−1.33***
	(0.38)	(0.35)	(3.22)	(3.29)	(4.53)	(4.54)
Asset Sales$_{t-2}$ Ind. Adj.	−0.61***	−0.61***	−1.10***	−1.10***	2.85***	2.86***
	(3.99)	(4.01)	(14.18)	(14.20)	(4.63)	(4.67)
Financial Distress$_{t-1}$	−0.28***	−0.28***	−0.21***	−0.21***	−0.61***	−0.61***
	(20.82)	(21.82)	(33.48)	(34.57)	(9.75)	(10.01)
Increase in TPay/CGS dummy$_{(t/t-2)}$	−0.01	−0.02	−0.04***	−0.05***	0.16***	0.38***
	(0.64)	(1.20)	(6.77)	(6.20)	(2.82)	(4.49)
Financial Distress$_{t-1}$ x Increase in TPay/CGS dummy$_{(t/t-2)}$	−0.08***	−0.09**	−0.05***	−0.09***	−0.31**	−0.61***
	(2.89)	(2.27)	(3.94)	(5.15)	(2.27)	(3.44)
D TPay/CGS>	90th Pct.	95th Pct.	90th Pct.	95th Pct.	90th Pct.	95th Pct.
Observations	50,202	50,202	54,759	54,759	51,080	51,080
Number of firms	7,148	7,148	7,235	7,235	6,925	6,925
R^2	0.04	0.04	0.16	0.16	0.02	0.02

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

It could be argued that the rise in payables is not exogenous, and that this increase can be a proxy for the extent to which firms are distressed. To address this concern, we examine the effect of a rise in trade payables in a subsample that only considers firms in financial distress. The results (not reported) persist. Firms in financial distress that significantly drop their trade receivables experience an additional decrease in performance of 14%−16%, depending upon the performance measure considered.

IV. Cross Sectional Variations of the Response of Trade Credit to Financial Distress

In Section II, we explored the response of the use of trade credit on financial distress. Because information regarding the terms of trade credit is unavailable, we can only estimate the reduced form for the quantity of trade credit outstanding at the firm level. Therefore, we cannot estimate the firm's actual demand for trade credit. In other words, we are unable to disentangle whether the higher level of trade credit is due to a greater demand from the distressed firm or from a higher supply from its suppliers. To learn more about the rationale behind this change in trade payables, we use the firm's characteristics that, according to previous theories of trade credit, should explain the cross-sectional variations observed in the data. Then, we use these characteristics to study the response of trade payables to financial distress. First, we split the sample on different partitions (subgroups) of the data according to the relevant firm characteristics. We then consider the interaction terms of the specific firms' characteristics with the dummy identifying firms in financial distress, estimating the following model:

$$TC_{it} = \gamma_i + \beta_1 \text{financial distress}_{it-1} + \beta_2 C_{it} + \beta_3 (\text{financial distress}_{it-1} \times C_{it}) + \beta_4 X_{it} + \varepsilon_{it}, \quad (3)$$

where C is a variable that captures a firm or industry characteristic. It enters the model alone and is interacted with the dummy for financial distress, Financial Distress$_{t-1}$.

A. The Importance of the Size and Market Power of the Firms

Several theories of trade credit predict that given the high cost of trade credit, whenever a firm is allowed to find financial credit, it will use it to replace trade credit (Petersen and Rajan, 1995,1997; Frank and Maksimovic, 2005; Cuñat, 2007). A similar view is held by Biais and Gollier (1997), who develop a theory that relies on the asymmetry in the cost of acquiring information about the buyer's creditworthiness as an incentive for suppliers to finance firms with lower access to financial credit. According to this theory, suppliers are assumed to be in a better position than financial creditors to assess the creditworthiness of their clients, so they should have a greater incentive to finance them.

The size of the firm provides a good setting for an empirical discussion of this topic. Larger firms are assumed to have better management and corporate governance, to generate more reliable information, to be followed by a larger number of analysts, and to have greater liquidity on the trading floor. These factors should lead to greater access to financing. According to this assumption, larger firms should use less trade credit than smaller ones. We can extend this intuition and expect larger firms to use less trade credit from suppliers when they are in financial distress, if they can obtain financial credit. In other words, the effect of financial distress on trade payables should be less important for large firms that have better sources of financing.

Table IV. Trade Credit, Financial Distress, and Firm Size

This table reports firm fixed effects regressions of trade credit on a financial distress dummy and a control, first dividing the sample according to firm size (Columns [1] and [2]) and then including the cross effect of size and financial distress (Columns [3]–[6]). The dependent variables are: 1) TPay/CGS that measures trade credit scaled by daily cost of goods sold, which should be interpreted as "days of trade payables," 2) TPay/A measuring the trade credit scaled by assets, 3) TPay/E that calculates trade credit on the book value of equity, and 4) TPay/FD that measures trade credit on the book value of financial debt. The financial distress dummy (Financial Distress$_{t-1}$) is equal to one if the firm is in distress at $t-1$ according to the Asquith et al.'s (1994) definition. Sales Growth measures the first difference in sales scaled by sales. Column [1] reports the results for the Large subsample, considering firms with sales above the median of the total sample. Column [2] presents the results for the Small subsample, considering firms with sales below the median of the total sample. The models in Columns [3]–[6] include the cross effect of Large Firms * Financial Distress$_{t-1}$, where Large Firms is a dummy variable that identifies firms whose sales were above the median of their industry in the year prior to entering into financial distress. Large Firms is automatically dropped from the fixed effects model as it is time invariant. The sample is the full sample from Compustat from 1980 to 2000. TROUBLE is the subsample of firms that enter financial distress at some time in the sample time. Regressions on Columns [3]–[6] are run on the TROUBLE subsample since the Large Firms dummy only considers firms that enter financial distress. The Hausman test in Row [a] tests the difference in the Financial Distress$_{t-1}$ coefficient of the Large subsample (Column [1]) with respect to the Small subsample (Column [2]). *t*-stats in the OLS specification are clustered by firms and are based on robust standard errors. All regressions include a constant, whose coefficients are not reported to save space. Absolute *t*-values are in parentheses below each coefficient.

	[1] TPay/ CGS	[2] TPay/ CGS	[3] TPay/ CGS	[4] TPay/ A	[5] TPay/ E	[6] TPay/ FD
Financial distress$_{t-1}$	1.54***	5.87***	5.77***	0.01***	0.16***	0.01***
	(2.63)	(9.78)	(9.24)	(13.01)	(17.24)	(4.86)
Sales growth	4.73***	1.14**	2.24***	0.01***	−0.02**	0.01
	(10.21)	(1.98)	(4.13)	(15.80)	(2.37)	(0.64)
Large firms*financial distress$_{t-1}$	–	–	−3.25***	−0.01***	−0.02	−0.01*
	–	–	(3.32)	(6.09)	(1.15)	(1.69)
Hausman test [a]	–	2.58	–	–	–	–
p-Value	–	(0.00)	–	–	–	–
Observations	46,861	38,866	34,677	34,961	34,551	30,060
R^2	0.76	0.70	0.62	0.71	0.45	0.59
Adj. R^2	0.72	0.63	0.57	0.67	0.38	0.53
Model	F. Effects	F. Effects	F. Effects	F. Effects	F. Effects	F. Effects
Sample	Large	Small	Trouble	Trouble	Trouble	Trouble

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

First, we split the data set into large and small firms. A firm is considered large if its sales are larger or equal to the median of its industry in any given year and small otherwise. We then estimate a fixed effects model on Equation (1) on both subsamples of firms. The results in Columns (1) and (2) of Table IV suggest that both large and small firms use more trade credit from suppliers when in financial distress. The coefficients for the dummy identifying financially distressed firms are positive and significant in both subsamples. The financial distress coefficient, however, is significantly smaller for large firms when compared to small firms. Large firms delay

their payments to suppliers by 1.5 days when in financial distress, while smaller ones present delays of more than 5 days. The Hausman test indicates that this difference is significant with a p-value of 0.00.[14]

These results suggest that the size of the firm plays an important role in the use of trade credit in financial distress. It could be argued, however, that the size of a firm can be affected by financial distress. It has been reported that firms entering financial distress tend to reduce their size due to decreasing sales and market share or because of asset sales (Opler and Titman, 1994; Altman, 1985; Pulvino, 1998). To circumvent this potential criticism, we use a different specification to study the effect of size. We compute the size of the firm at the last prefinancial distress year, and generate a dummy named "PRE_SIZE" that is equal to one if the firm was large at the prefinancial distress time, and zero otherwise. We use this dummy alone and interacted with financial distress$_{t-1}$ in the estimation of Equation (3). Note that by construction, this model only considers those firms that enter financial distress in the time span considered in the paper. Thus, the sample becomes mechanically restricted.[15] This specification allows us to study the effect of financial distress on trade credit in firms that were large before entering in financial distress.

In Column (3) of Table IV, we run the model on the full sample, but include a cross effect of size with financial distress. The results are consistent with the ones reported throughout this section. The financial distress coefficient is positive and similar to our base case, while the coefficient of the interaction term is negative. These results suggest that firms that enter financial distress increase their use of trade payables by 5.77 days, but this increase in trade payables is 3.25 days lower when the firm is large. In other words, a large firm increases, on average, its use of trade payables by 2.52 days when in financial distress, while the average firm, with less financing options, extends its trade payables by 5.77 days. These results, consistent with the trade credit theories, imply that larger firms rely less on financing from suppliers when entering financial distress than their smaller counterparts.

In addition, we test the effect of size on the substitution effect between trade credit and other sources of capital discussed above. We estimate a fixed effects model on Equation (3) using the dummy variable that identifies firms that were large prior entering financial distress. The results are reported in the last three columns of Table IV. We see that larger firms have less substitution (trade credit vs. other sources of financing) than smaller ones. Moreover, in the cases of assets and financial debt, Columns (4) and (6), the increase in use of trade credit is almost canceled for large firms.[16] Overall, these results imply that substitution is significantly weaker for larger firms, confirming the results reported above.

Overall, the results using size as a firm characteristic tend to suggest that firms that are able to secure financing from other sources (i.e., not trade credit) tend to utilize it more readily before tapping into trade credit. It could be that firms prefer financial credit as it is cheaper or it may be that they do not want to stretch their payments to suppliers unless it is absolutely necessary. The

[14] In a more formal test of these differences, we include a dummy variable identifying large firms, alone and interacted with all the variables in the model, in a single regression. We perform an F-test of joint significance of the size dummy and its interactions. The test rejects the null of non-significance with p-values of 0.00. Moreover, its interaction with financial distress is negative and significant at the 1% level (−5.3 days). These results are not reported, but available upon request.

[15] In this specification, we dropped the firms that remain in financial distress for more than five years. Including them, however, does not change the results in a significant way.

[16] Additionally, if we estimate Equation (1) using TPay/A, TPay/E, and TPay/FD as dependent variables and split the sample by size, we find that both large and small firms demonstrate evidence of the substitution effect we find in Section II, but all the coefficients for large firms are smaller (about half) than the ones for small firms, implying a larger substitution effect for small firms.

results in this section seem to suggest that firms consider trade credit to be lower in the pecking order of financing.

B. The Case of Retailers; Deployable Assets as Collateral for Suppliers

Some theories of trade credit (Burkart and Ellingsen, 2004) state that when the products sold by the firm are not deployable, they can be used as collateral from suppliers to secure trade credit. The characteristics of firms in the retail industry provide a nice setting to extend our knowledge about the behavior of trade credit during financial distress. Retailers buy products and generally sell them without further manipulation, keeping them in inventory for a very short time. Products are sold and converted into cash relatively quickly. According to the theory, retailers should get less trade credit from suppliers because their goods are highly deployable and, as such, less valuable as collateral to suppliers as they are subject to moral hazards by the debtor. This problem should be magnified in financial distress, as the incentive to divert cash becomes greater. These characteristics are also subject to a different interpretation. Deployable goods, and especially the large generation of cash by retailers, constitute liquid collateral for financial credit.[17] Therefore, retailers would be in a better position to obtain bank financing even in financial distress. Consequently, we should expect retailers to use less trade credit than other firms.

We define retailers as firms that operate in the Fama and French (1997) industry number 41 (DNUMS 5000 to 5190 from Compustat) and identify them with a dummy variable named RETAIL. We estimate the model in Equation (1) on two subsamples, retailers and nonretailers, to study the effect of financial distress on retailers' trade credit from suppliers. The results are found in Table V, Columns (1) and (2). We only report the results of the fixed effects model. The results indicate that retailers do not increase their trade credit when they are in financial distress, when compared to the 5.5 days increase for nonretailers.[18] We then consider the framework of Equation (3) to test of the effect of financial distress on retailers' trade credit. We use the RETAIL dummy alone and interacted with financial distress$_{t-1}$. The results presented in Column (3) of Table V confirm that retailers in financial distress do not increase their use of trade payables, consistent with the results in Column (1). The coefficients for Financial Distress$_{t-1}$ and for the cross effect of the RETAIL dummy and financial distress$_{t-1}$ cancel each other out. This result seems to support the intuition that firms with cash and deployable goods have an advantage in obtaining financial credit when they are in financial distress.[19]

We additionally study the effect of financial distress on retailers with high-market share. As a proxy for market power, we use the measure of the retailer's market share in the year before entering financial distress. This setting reduces our sample size as it only considers retailers that enter financial distress during the time span of this paper. The results are noted in Column (4) of Table V. The coefficient on the term that identifies high-market share, financially distressed retailers is negative and significant suggesting that more dominant retailers tend to decrease the use of trade payables during financial distress.

[17] Pledging cash inflows is common practice in industries with a large generation of cash. An example of this is the pledge of cash inflows of tolls collected from highways as collateral for financing a project. This pledge is relatively easier for financial institutions than for suppliers.

[18] The results of the pooled OLS, not reported, indicate that that both retailers and nonretailers use more trade credit when in financial distress. However, the difference is great. Retailers increase their payables by less than 7 days, while nonretailers exhibit an average increase of almost 20 days.

[19] The results need to be interpreted with some caution. We are using an industry to proxy for firm characteristics, and this proxy may be imperfect or polluted by other variables that may introduce a bias into the results.

Table V. Trade Credit and Financial Distress in Retail Firms

This table reports firm fixed effects regressions of trade credit on a financial distress dummy and a control, first dividing the sample between retailers and nonretailers (Columns [1] and [2]), then including the cross effect of the RETAIL dummy and financial distress (Column [3]), and additionally considering a dummy for distressed retailers with high market share. The dependent variable is the ratio of Trade Payables on Cost of Goods Sold (TPay/CGS). The financial distress dummy (Financial Distress$_{t-1}$) is equal to one if the firm is in distress at $t-1$ according to the Asquith et al.'s (1994) definition. Sales Growth measures the first difference in sales scaled by sales. RETAIL is a dummy variable that identifies the firm as a retailer. We define retailers as firms that operate in the Fama & French (1997) industry number 41 (DNUMS 5000–5190 from Compustat). The regression in Column [1] considers firms with a RETAIL dummy equal to one, and the regression in Column [2] considers firms with a RETAIL dummy equal to zero (nonretailers). RETAIL * Financial Distress$_{t-1}$ is an interaction term that identifies retailers in financial distress. The model in Column (4) includes a dummy that identifies retailers whose market share was higher than the median of its industry in the year prior to entering into financial distress (High Market Share Pre Financial Distress). This variable is dropped by the fixed effects model, but its interaction with Financial Distress$_{t-1}$ is captured by the variable Distressed Retailers with high Market Share. The sample is the full sample from Compustat from 1980 to 2000. All regressions include a constant, whose coefficients are not reported to save space. Absolute t-values are in parentheses below each coefficient.

	[1] TPay/CGS	[2] TPay/CGS	[3] TPay/CGS	[4] TPay/CGS
Financial distress$_{t-1}$	−0.18	5.52***	5.51***	0.97
	(0.19)	(12.83)	(13.13)	(0.70)
Sales growth	5.31***	1.92***	2.02***	5.05**
	(4.91)	(5.07)	(5.56)	(2.42)
RETAIL			53.84	
			(0.60)	
RETAIL*financial distress$_{t-1}$			−5.91***	
			(3.17)	
Distressed retailers with high market share				−15.49**
				(2.52)
Observations	5,379	80,348	85,727	2,051
R^2	0.78	0.70	0.70	0.68
Adj. R^2	0.74	0.65	0.66	0.64
Model	F. Effects	F. Effects	F. Effects	F. Effects
Subsample	Retailers	Nonretailers	Full sample	Trouble, retailers

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

These results seem to suggest that those firms that are unable to secure alternative sources of financing may elect to obtain suppliers' trade credit. However, if they can avoid doing so, they will try to do so. The results in the last two sections imply that the effect of financial distress on trade payables is not equal across all firms.

V. Conclusions

We have examined the effect of financial distress on the amount of supplier's trade credit. Using standard panel data techniques on 20 years of US corporate data, we find strong evidence

suggesting that financially distressed firms use more trade credit from suppliers than healthy ones. These results are consistent with Petersen and Rajan (1997) who, on a different data set, find that firms with less access to financial credit use more trade credit. The results also imply that supplier's trade credit is used as an alternative source of financing when firms enter financial distress.

Because trade credit is an expensive source of financing, it is reasonable to expect that firms in financial distress increasing its use incur extra costs that diminishes their performance. Using a model similar to Molina and Preve (2009), we estimate the cost of financial distress for firms that significantly increase their use of trade credit when they enter financial distress. We confirm the drop in performance for firms in financial distress reported in the literature, but we add to it by identifying the extra cost of financial distress for firms increasing the use of trade credit. In general, we can state that a significant portion of the costs of financial distress (about one-third) can be explained by the increase in use of suppliers' trade credit.

To understand the reasons behind the increase in trade credit for firms in financial distress (i.e., disentangling between a supply and a demand effect), we identify several firm and industry characteristics that, according to the previous literature, should explain the cross-sectional variations in the level of trade credit. We find that smaller and less dominant firms increase their use of suppliers' trade credit when in financial distress significantly more so than larger firms. This finding is consistent with the theory that larger and more dominant firms use financial credit instead of more expensive trade credit. It is also consistent with the greater propensity for larger and more dominant firms to use debtor-in-possession financing in "Chapter 11." An alternative interpretation is that smaller firms generate less information and their creditworthiness is more difficult to assess. Therefore, suppliers have an informational advantage that allows them to lend money to their financially distressed clients.

We also find that retailers use less trade credit than nonretailers when they are in financial distress. This is consistent with the predictions of Burkhart and Ellingsen (2004) regarding the possibility of repossessing and reselling the goods sold, but it can also be explained by the fact that retailers generate more cash constituting better collateral for financial creditors.

These results suggest that firms seem to prefer financial credit over trade credit. Trade credit is chiefly used in those situations in which financial credit is difficult to obtain. The results of this paper support the idea that financial credit rates higher than trade credit in the "pecking order" of financing sources.[20]

The fact that firms in financial distress report problems with suppliers does not mean that suppliers are not extending their trade credit terms to help finance financially distressed firms. Firms in financial distress are forced into bankruptcy when they fail to satisfy their agreement with their suppliers. This is consistent with the results that suppliers support financially distressed firms (as long as they foresee an acceptable probability of survival of the buyer), and force them to bankruptcy when they lose confidence.

This paper adds to two streams of the literature, trade credit, and financial distress. First, it examines the effects of financial distress on trade credit and uses several of the established theories of trade credit to disentangle whether this increase in trade credit is a demand or a supply effect. Moreover, it identifies and measures a cost of financial distress that has not been considered before. Firms in financial distress use more trade credit from suppliers, which is expensive and adds to the costs of financial distress. In summary, this paper represents a further step toward a more precise and comprehensive determination of the mechanics of trade credit

[20] It is worth mentioning, however, that Biais and Malécot (1996) report a heavy use of trade credit in France where suppliers do not get anything in the case of bankruptcy of the debtor.

and working capital management, and on the effects of financial distress in the day-to-day firm decision-making process.

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