IMPACT OF RESOURCE SLACK ON DEMAND FOR TRADE CREDIT: EVIDENCE FROM STICKY COSTS

By

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This dissertation has been submitted in partial fulfilment of the requirements for the Fellow Programme in Management in the Accounting area. The dissertation committee includes the following members:

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An Abstract of the dissertation of

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I provide evidence that managers demand more trade credit when their firms' costs become stickier. Because cost stickiness- a consequence of decision to retain slack- can be either value maximising or value destroying, it becomes a source of information asymmetry between the firm and its financiers. Managers deal with this increase in information asymmetry by reaching out to suppliers for financing, to benefit from suppliers' information advantage in understanding cost stickiness. Further, I find that the positive relation between cost stickiness and managers' demand for trade credit is driven by cost stickiness that is perceived to be abnormal, as this is where suppliers' information advantage becomes more useful. Likewise, cross-sectional analyses reveal that the increase in demand for trade credit is lower when quality of public information set is adequate, or when firm's monitors can limit managerial opportunism in investment in slack, consistent with the suppliers' information advantage story.

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TABLE OF CONTENTS

LIST OF TABLES

1. Introduction

Extant literature documents that firms' costs are sticky, that is, costs increase more with an increase in sales than they decrease with a similar decrease in sales, owing to excess resources, or slack, maintained by managers (Anderson, Banker, & Janakiraman, 2003; R. Banker & Byzalov, 2014; Weiss, 2010). Research documents that both, value-maximising resource management and value-destroying empire building by the manager,[1] can lead to cost stickiness (R. Banker & Byzalov, 2014). Because the exact reason behind cost stickiness is only known to the manager, cost stickiness is a source of information asymmetry between the firm and its financiers. This increase in information asymmetry might induce managers to change the way they finance the firm. In this paper, I examine whether managers demand more trade credit- an alternate but important source of financing- when firms' costs become stickier.

A manager might choose trade credit in this setting to benefit from suppliers' information advantage. It is worth noting that suppliers get to know the timing and volume of the transactions done by the firm in the normal course of business and they can benchmark this information against similar information of other buyers in the same industry, with similar operating environment (Mian & Smith, 1992; Petersen & Rajan, 1997). As a result, suppliers are able to access and process information about firm's operations more efficiently than other financiers. This ability might translate to lower information asymmetry about cost stickiness, making trade credit a more viable option than other sources of finance.

However, use of more trade credit increases firm's dependence on the supplier in facing uncertain demand. This increase in dependence increases the likelihood of supplier's selfish

[1] By maintaining slack resources, a manager might minimise costs incurred to adjust resource levels (Anderson, Banker, & Janakiraman, 2003; R. D. Banker, Byzalov, & Chen, 2013), or create complex organisation to maximise her compensation (C. X. Chen, Hai, & Theodore, 2011), or avoid reduction in resource levels to evade hassles associated with downsizing (C. X. Chen et al., 2011).

behaviour (Hawkins, Wittmann, & Beyerlein, 2008; Provan, 1993; Provan & Skinner, 1989; Williamson, 1975) which may lead to costly renegotiations and hold-ups, thus, increasing the risks associated with trade credit (Hawkins et al., 2008; Schilling & Steensma, 2002; Skarmeas, Katsikeas, & Schlegelmilch, 2002).[2] As a result, the hypothesized positive relation between cost stickiness and demand for trade credit becomes weakened, which introduces a bias in favour of accepting the null that cost stickiness has no impact on demand for trade credit.

To empirically test the relation between demand for trade credit and cost stickiness, I use a panel of 32,649 firm-year observations comprising of 3,947 unique firms in the US from 1986 to 2015. I model a firm's demand for trade credit as a function of cost stickiness and three sets of control variables. To measure a firm's demand for trade credit, I use log of days payable outstanding (DPO).[3] And to measure a firm's cost stickiness, I use the method proposed by Weiss (2010) and used in several studies examining the consequences of cost stickiness (R. Banker & Byzalov, 2014). Specifically, I first identify the most recent quarter when sales increased and the most recent quarter when sales decreased out of the four previous quarters, and then I calculate the absolute value of difference between *log of change in costs per unit change in sales* across these two quarters.[4] This measure captures the deviation of cost structure from cost symmetry.

[2] When suppliers perceive rising default risks, they initiate renegotiations and can seek more information about firm's cost stickiness. Given that trade credit finance, once availed, becomes an important source of funding as well as an important signal of firm's creditworthiness, the manager will feel compelled to divulge the proprietary information sought by the supplier. One of the key information that can be sought by suppliers, in this context, is sales forecasts. Sales forecasts are considered trade secrets, for example, in a patent on the subject of trade secrets filed in 2005 by Halligan and Weyand (United States Patent No. US20050096954A1, 2005). Once this information is shared, there is a possibility that the trade secret will be revealed to the competitor and will lose its value.

[3] Days Payables Outstanding = Log (1+ (Accounts Payables / (Cost of Goods Sold/ 365))), where Cost of Goods Sold (COGS) is an aggregation of all costs incurred to produce the goods, including material, labour, and overheads. While deflating Accounts Payables by COGS is the best possible alternative in absence of data on amount of purchases, the results are qualitatively similar if I deflate Accounts Payables by Sales, Closing Raw-material Inventory, or Receivables.

[4] The results are also robust to using eight or twenty quarters of data instead of four quarters in calculating cost stickiness (Chou, Louis, & Zhuang, 2015; Weiss, 2010).

As stated earlier, I include three sets of control variables to the model. The first set includes firms' age, size, long-term debt, cash holdings, Altman-Z score (Altman, 1968), and whether the firm was loss making in the given year. These variables capture firm's access to other sources of funds. Firm's access to funds impacts both manager's demand for trade credit (dependent variable), and cost stickiness (independent variable) and could therefore confound the relationship between cost stickiness and trade credit. In particular, research has documented the significance of trade credit for firms that lack access to other sources of funds (Mian & Smith, 1992; Petersen & Rajan, 1997). This implies that access to other sources of funds is a determinant of demand for trade credit. Furthermore, cost stickiness entails incurring costs which requires funds. Hence, the amount of slack in a firm, and consequently, cost stickiness, is a function of firm's access to funds. To the extent this set of variables capture access to alternate sources of financing, addition of these variables to the model mitigates the possibility of biased estimates due to firm level differences in access to funds.

The second set of control variables include predictability of firms' earnings (Francis, LaFond, Olsson, & Schipper, 2004), volatility of firms' earnings (Dichev & Tang, 2009), and the unexpected part in firms' earnings (Bartov, 1992). These variables capture accounting quality. I add these variables to the model to ensure that the stickiness-trade credit relationship is not driven by previously documented relationship between cost stickiness and accounting quality (Weiss, 2010), and accounting quality and trade credit (D. Chen, Liu, Ma, & Martin, 2017; X. Li, Ng, & Saffar, 2017).

The third set of variables capture suppliers' incentives to supply trade credit. Specifically, I add supplier industry concentration, proportion of firms in the supplier industry with negative net income in the previous year, and proportion of firms in the supplier industry with negative sales growth in the previous year. These variables capture the competitive landscape of supplier

industry, which has a direct impact on suppliers' incentives to vary the supply of trade credit (Dass, Kale, & Nanda, 2015).[5] Supply of trade credit could affect DPO as well as stickiness, by enabling firms to retain more slack. Thus, addition of this set of variables makes the regression analysis less sensitive to firm level differences in suppliers' incentives to supply trade credit. While the analysis is immune to major supplier-industry's effects, impact of individual supplier on the regression analysis cannot be captured because the data aggregates trade credit availed by the buyer from all its suppliers.

Moreover, I add industry, captured by 2-digit SIC of the firm, and year fixed effects to the model. This transforms the analysis to within industry, within year, assuaging the concern that some unobservable time-invariant industry characteristic and/or firm-invariant macroeconomic factor is driving the results.[6] Lastly, I use one-year lagged value of cost stickiness and all the control variables in all the specifications to ensure that causality is in the hypothesized direction.

Results from the analyses show a statistically significant positive relation between firm's cost stickiness and level of trade credit. These results are also economically meaningful; I find that a standard deviation change in stickiness increases DPO by 0.053 standard deviations (which is 10% of the standard deviation of DPO).[7] From these results, we can infer that managers reach out to suppliers for financing, to benefit from suppliers' information advantage in

[5] In a separate analysis, to control for some unobserved industry-year factors which are not captured by the controls mentioned above but can systematically impact suppliers' supply of trade credit, I run tests with supplier industry-year fixed effects in the model, therefore transforming the analysis to within supplier industry and within a year. This transformation controls for the pressures or incentives faced by the supplier industry in a particular year that can lead to an increase in supply of trade credit.

[6] The use of these specific fixed effects is consistent with Chen et al. (2017) who look at the impact of differences in firm level accounting quality on trade credit, Bharath et al. (2008) who look at the impact of differences in firm level accounting quality on debt contracting, and He et al. (2018) who look at impact of cost asymmetry on firm's dividend policy. While firm fixed effects can capture within firm variation, the focus of this paper is to capture cross-sectional (between firm) variation in the cost stickiness and its impact on manager's demand for trade credit.

[7] This estimated coefficient is reported in Table 3, Column 5. The effect is calculated as follows: (estimated coefficient) × (standard deviation of the independent variable) / (standard deviation of the dependent variable)

understanding manager's decision to maintain slack. The results in this paper, therefore, complement Bharat, Sunder, and Sunder (2008), who document that managers access bank financing to benefit from banks' superior capabilities, compared to bond-holders, in understanding firm's accruals.

However, it can be argued that the component of cost stickiness that is common to all firms in a group might not be perceived as arising out of managerial opportunism. My hypothesis is that information asymmetry between the firm and its financiers is driving the positive relation between cost stickiness and demand for trade credit. If this is the case, then cost stickiness that remains after accounting for the common component within a group of related firms should drive this positive relationship between cost stickiness and demand for trade credit.

To test this, I model firm's demand for trade credit as a function of cost stickiness perceived as normal, cost stickiness perceived as abnormal, and other controls. I divide total cost stickiness into cost stickiness perceived as normal and cost stickiness perceived as abnormal using two different methods. In the first method, I assume that industry-average cost stickiness is perceived as normal by external parties. This implies that the component of total cost stickiness that remains after deducting the industry-average cost stickiness is perceived as abnormal cost stickiness. Similarly, in the second method, I assume that the component of cost stickiness that can be explained by labour adjustment costs, as proxied by unemployment benefits extended by the states, is perceived as normal by external parties. Thus, the component that remains after deducting this part is perceived as abnormal. Consistent with the hypothesis that managers benefit from suppliers' information advantage in understanding reasons behind slack, I find that managers demand more trade credit when firms have abnormal cost stickiness.

In the next set of tests, I extend these results by doing subsample analyses to understand which firms increase their demand for trade credit more when their cost stickiness is high. First, I look

at differences in information advantage of the suppliers. Literature documents that demand for trade credit will increase more when suppliers have an information advantage over other financiers (D. Chen et al., 2017; X. Li et al., 2017). In the context of cost stickiness, a supplier's information advantage will be starkly higher than that of other financiers for firms whose with inadequate public information set is inadequate. I find results consistent with the hypothesis. To test the hypothesis, I use four measures of quality of firm's public information set, viz., Size, Age, Bid-Ask Spread, and Sales Growth. Given the inadequacy of the public information set in a firm which is smaller (Slovin, Johnson, & Glascock, 1992), is younger (Diamond, 1989), has higher bid-ask spreads (Coller & Yohn, 1997; Venkatesh & Chiang, 1986), or has higher growth (Dey, 2008), the managers of these firms increase their demand for trade credit more when costs are stickier.

Next, I look at variation in the strength of governance mechanisms of the firm. To the extent a firm's governance mechanisms monitor managers' investment in slack resources, information asymmetry due to cost stickiness should be lower. Thus, firms with better governance will have better access to funds from other sources despite sticky costs, and their demand for trade credit might be lower. I find results consistent with this hypothesis. I use four measures of governance, viz., Big4 vs NonBig4 auditor, analyst coverage, ownership diffusion, and debt, to test the hypothesis. Given that firms with a Big4 Auditor (Armstrong, Guay, & Weber, 2010); higher analyst coverage (T. Chen, Harford, & Lin, 2015); higher ownership concentration (Gilson, 2006); and higher bank debt (Degryse & Ongena, 2005; Diamond, 1984; Fama, 1985; Petersen, 2004; Ramakrishnan & Thakor, 1984; Slovin, Sushka, & Hudson, 1990) are better monitored firms, the manager of these firms increase their demand for trade credit less when costs are stickier.

In summary, I find robust evidence that managers increase their demand for trade credit when costs become stickier. Further, the increase in demand for trade credit is higher if suppliers' information advantage is more significant because of inadequate public information about the firm or weak monitoring by other parties. Overall, these findings suggest that cost stickiness, a source of information asymmetry between firms and financiers, has an impact on how managers finance their operations. It is noteworthy that research documents an increase in bond yield spreads and credit risk due to cost stickiness (Chou, Louis, & Zhuang, 2015; Homburg, Nasev, Reimer, & Uhrig-Homburg, 2016). My findings complement this line of research. In particular, I document that managers, in order to reduce the impact of cost stickiness on cost of financing, avail financing from suppliers who have more information about slack. These findings, therefore, also complement Bharath et al., (2008), who document that managers reach out to banks instead of public debtholders to benefit from banks' information advantage in understanding firms' financial statements. Specifically, I document a setting, cost stickiness, where supply chain finance becomes more lucrative due to suppliers' information advantage.

Moreover, my analysis shows that cost stickiness increases demand for trade credit despite controlling for various proxies of accounting quality. The findings complement the long strand of research that considers cost stickiness a determinant of time series of earnings (Anderson et al., 2003; R. Banker & Byzalov, 2014; Chou et al., 2015; Homburg et al., 2016; Weiss, 2010). In this context, my paper is related to D. Chen et al. (2017) who documented that demand for trade credit is higher in firms with worse financial reporting quality. I, however, show that the relationship between demand for trade credit and cost stickiness is not driven by the previously documented relationship between accounting quality and trade credit and the relationship between cost stickiness and accounting quality.

These findings also contribute to the literature on determinants of demand for trade credit. This strand of literature has documented that demand for trade credit is increasing in unavailability of funds from financial institutions and capital markets (Abdulla, Dang, & Khurshed, 2017; Garcia-Appendini & Montoriol-Garriga, 2013; Petersen & Rajan, 1997). One of the potential benefits of accessing trade credit is that it is a signal of firm's credit worthiness to other sources of finance (Petersen & Rajan, 1997). In this paper, I document a setting, cost stickiness in firms, where a supplier can act as an information intermediary between the firm and its other financiers due to her information advantage in understanding firm's operations.

Lastly, this paper contributes to the literature on slack resources, in two important ways. First, by using cost stickiness as a measure of slack, this paper documents that higher slack in a firm makes it demand more trade credit. This is an extension of a literature that has primarily focussed on slack's impact on firm performance (Daniel, Lohrke, Fornaciari, & Turner Jr., 2004) and innovation (Nohria & Gulati, 1996). Second, I use cost stickiness as a proxy for slack. So far slack has been measured using crude accounting measures like SG&A expenses without a direct consideration of the impact of change in sales activity of a firm on the level of SG&A expenses incurred. While measuring cost stickiness, changes in resource levels are considered in conjunction with changes in sales activity, which makes cost stickiness a more precise measure of slack.

The rest of the paper is organised as follows. Section 2 develops the hypotheses by reviewing the relevant literature. Section 3 outlines the research design and variable measurement. Section 4 enlists the sources of data used in empirical analysis and discusses summary statistics. Section 5 discusses the results of the empirical analysis. Section 6 offers concluding remark and implications of the findings.

2. Hypotheses Development

Research documents that costs react asymmetrically to changes in sales and that this is a consequence of managers maintaining slack (Anderson et al., 2003). Slack is defined as resources in excess of what an organisation needs to sustain its operations (Cyert & March, 1963; Vanacker, Collewaert, & Zahra, 2017). Under the behavioural theory of firm, slack acts as an enabler of innovation and strategic behaviour that creates wealth, and acts as a buffer to stabilize a firm's activities in face of external shocks (Cyert & March, 1963). However, under the agency theory of firm slack is an indication that managers are building empires (Anderson et al., 2003; C. X. Chen, Hai, & Theodore, 2011; Jensen & Meckling, 1976). Research also documents that in excess, slack can incentivise managers to be undisciplined (Nohria & Gulati, 1996).

Banker & Byzalov (2014), in their review of literature on cost asymmetry conclude that cost stickiness or managers' decision to keep slack depends on three factors viz., prior period resource levels that affect adjustment costs today, expectation of level of future sales, and factors arising out of managerial biases. However, whether manager maintains slack to minimise resource adjustment costs or to maximise private benefits is her private information. Thus, cost stickiness is a source of information asymmetry between managers and external financiers, including debt holders. This increase in information asymmetry leads to adverse selection costs and might impact the cost of finance. While research documents that cost stickiness is associated with higher cost of debt (Homburg et al., 2016) and higher yield spreads (Chou et al., 2015), it has not examined whether managers choose alternate sources of funds, like trade credit, a contract in which a supplier finances the buyer, to mitigate this higher cost of debt.

A close study of trade credit is especially interesting in the context of cost structures because suppliers have an information advantage that can mitigate the impact of information asymmetry arising due to cost stickiness. This information advantage arises due to two reasons. One, suppliers understand firm's operating performance better because they have the information on the timing and volume of orders placed by the firm, and, two, they cater to a network of buyers who are all working in the same operating environment, facing the same uncertainties, which creates a set of benchmarks on which a particular buyer's operations can be judged (Mian & Smith, 1992; Petersen & Rajan, 1997).

Research documents that managers reach out to a specific source of financing to benefit from lower information asymmetry in that transaction. A case in point is Bharath et al. (2008), who show that when managers face high agency costs due to worse accounting quality, they choose private loans instead of public loans to benefit from information access and processing capabilities of banks over debtholders. Likewise, research on trade credit documents that when a firm faces paucity of funds due to issues related to her perceived credit worthiness, it reaches out to supply chain for financing (Ng, Smith, & Smith, 1999). Lenders consequently reduce the credit rationing because trade credit works as a signal to lenders that the firm is a credit worthy firm (Biais & Gollier, 1997; Nilsen, 2002).

However, increasing the demand for trade credit when costs become stickier can make supplier more powerful, a risky outcome for the manager. Suppliers extend trade credit because they can enforce repayment by threatening to block the supplies which can negatively impact the operations of the firm (Cuñat, 2007). Because demanding more trade credit increases firm's dependence on suppliers, they may indulge in opportunistic rent-seeking behaviour (Hawkins et al., 2008; Provan, 1993; Provan & Skinner, 1989; Williamson, 1975). Once the suppliers perceive that the default risk is higher, they might seek proprietary information from the

managers to explain rising cost stickiness. If the manager obliges, there is a possibility that a trade secret[8] is revealed to the supplier, and then to a competitor, which will dilute the value of the trade secret. If the manager does not oblige, he risks losing trade credit, thus impacting firm's financial well-being and its portfolio of signals used to signal credit worthiness to other financiers. This possibility of a hold-up increases the risks associated with the transaction and dilutes the hypothesized positive relation between cost stickiness and managers' demand for trade credit.

The hypothesis in null form is:

H1: Cost stickiness has no impact on firm's demand for trade credit

Hypothesis 1 posits that managers demand more trade credit to reduce the impact of adverse selection costs arising due to cost stickiness. The next two hypotheses explore this channel using cross sectional tests. I posit that the result should be stronger for firms where the quality of public information set is inadequate and where weak monitoring mechanisms exacerbate the possibility of managerial opportunism in maintaining slack.

Literature documents that demand for trade credit will increase more when suppliers are better informed compared to other financiers as those are the situations when managers benefit most from reduction in adverse selection costs (D. Chen et al., 2017; X. Li et al., 2017). In the context of cost stickiness, a supplier's information advantage will be starkly higher than other financiers for those firms with inadequate public information set. For example, using data from National Survey of Small Business Finance (NSSBF) Petersen and Rajan (1997) find that financing advantage drives use of trade credit. To test this hypothesis, I use four proxies of quality of firm's public information set, viz., Size, Age, Bid-Ask Spread, and Sales Growth.

[8] For example, sales forecasts (United States Patent No. US20050096954A1, 2005)

The choice of the first proxy, size, is based on the extant literature that has documented that smaller firms benefit more from information access and processing capabilities of private lenders (Diamond, 1984; Fama, 1985; Slovin et al., 1992). In the context of cost stickiness, suppliers have an information advantage over other financiers because they can access information about slack in the natural course of their business and process that information using benchmarks available from other buyers that they cater to. This advantage further exacerbates in smaller firms which do not have adequate public information set in terms of both past and current information (Slovin et al., 1992). Thus, increase in demand for trade credit due to increase in cost stickiness might be higher for smaller firms. Similarly, younger firms also have a dearth of information on which external financiers can judge manager's decisions about slack (Diamond, 1989; Slovin et al., 1992). Hence, manager of a younger firm should demand more trade credit to benefit from suppliers' information advantage in understanding cost stickiness. Furthermore, literature documents that bid-ask spread captures the overall information asymmetry between the firm and the financiers (Coller & Yohn, 1997; Venkatesh & Chiang, 1986). It is plausible that the higher information asymmetry captured by bid-ask spread is a result of lack of information dissemination that further exacerbates the inability of financiers to monitor managerial opportunism in her slack decision. Thus, managers of firms with higher bid-ask spread will benefit more from suppliers' information advantage, leading to higher demand for trade credit. Lastly, firms with high sales growth have higher information asymmetry and the managers of these firms have a lot of resources under their control which can impact their incentives to build empires or downsize (Dey, 2008). Suppliers can use their information advantage to understand whether cost stickiness of this firm is due to value maximising cost optimisation or value destroying empire building. Thus, firms with higher growth might demand more trade credit when their costs become stickier.

In a nutshell, given the inadequacy of her firm's public information set, a manager might demand more trade credit when costs are sticky in a firm which is small, young, stained with higher bid-ask spreads, or enjoying higher growth, to benefit from suppliers' information advantage. In null form,

> *H2: Quality of firm's public information set, proxied by firm's size, age, bid-ask spread, and sales growth, has no effect on the relationship between cost stickiness and demand for trade credit.*

Next, I look at the impact of firm's monitors on the relationship between firm's cost structure and demand for trade credit. Literature has documented that corporate gate-keepers limit the space for managerial opportunism (Dey, 2008). One could posit that these monitoring mechanisms will also limit managerial opportunism in investment in slack. Thus, firms with better monitors will have access to other sources of finance despite higher cost stickiness. I use four proxies to measure quality of firm's monitors.

One of the important external monitoring mechanism available with firms to commit good quality information supply is high quality auditing (Armstrong et al., 2010). Literature documents that better audit quality reduces information asymmetry costs between borrowers and lenders and, consequently, reduces cost of debt (Dhaliwal, Gleason, Heitzman, & Melendrez, 2008; C. Li, Xie, & Zhou, 2010). Furthermore, increase in disclosure quality is associated with lower information asymmetry between participants (Brown & Hillegeist, 2007) and better audit quality is associated with higher disclosure quality (Dunn & Mayhew, 2004). Thus, for firms with better auditing quality, cost stickiness induced information asymmetry between providers of funds and the firm might be lower, and, consequently, the demand for trade credit will be lower.

Literature has also documented that analysts act as an information intermediary between firm and external stakeholders, and that drop in analyst coverage increases information asymmetry between the firm and providers of funds (Balakrishnan, Billings, Kelly, & Ljungqvist, 2014; Kelly & Ljungqvist, 2012). In the process of collecting information to produce accurate forecasts, analysts also monitor the firm (Chung & Jo, 1996; Jensen & Meckling, 1976; Moyer, Chatfield, & Sisneros, 1989). Thus, for firms with higher analyst coverage, information asymmetry arising out of cost stickiness might be lower, and, consequently, the demand for trade credit due to stickier costs might be lower.

Next, I consider the possibility that ownership structure will impact the relationship between cost stickiness and demand for trade credit through the monitoring channel. Lower ownership concentration leads to co-ordination problems which leads to less effective monitoring (Hill & Snell, 1989). If this is the case, then information asymmetry due to cost stickiness will be higher for firms that have diffused ownership and thus access to external sources of funds should be worse for these firms (Gilson, 2006). This implies that firms with more diffused ownership will be more inclined to reach out to suppliers for financing.

Lastly, lenders usually monitor firms and act as information intermediaries for public debtholders (Diamond, 1984; Fama, 1985). Moreover, research has shown that lenders usually make investments in collecting both hard and soft information about existing borrowers to monitor whether firms meet their obligations under debt contracts (Degryse & Ongena, 2005; Petersen, 2004). One would expect that this investment is proportional to the funds at stake. Hence, banks will have higher incentives to develop mechanisms to monitor clients with larger debt obligations. I assume that high levels of leverage standing in the firm's balance sheet proxies for high amount of investment by external financiers in monitoring the firms. To the

extent this monitoring can signal lower managerial opportunism in investment in slack, managers' demand for trade credit will increase less.

Thus, I hypothesize that firms with better monitoring mechanisms in place, in other words, firms with better auditors, higher analyst coverage, concentrated ownership, and high total debt, will increase their demand for trade credit to a lower extent.

In null form,

> *H3: Quality of monitors monitoring managerial decisions, proxied by firm's auditor's identity, analyst coverage, ownership concentration, or leverage, has no effect on the relationship between cost stickiness and demand for trade credit.*

3. Research Design & Variable Measurement

In this section, I describe my regression models, variable measurement and sample section.

3.1 Measuring cost stickiness ($Sticky$) and demand for trade credit (DPO)

Consistent with the advice by R. Banker and Byzalov (2014) for studies that explore consequences of cost asymmetry, I follow Weiss (2010) to measure cost stickiness.

To measure cost asymmetry, I calculate the difference between the rate of cost increase for the most recent quarter which witnessed an increase in sales and the rate of cost decrease for the most recent quarter which witnessed a decrease in sales. The search for a sales decrease and a sales increase is restricted to 4 recent quarters. So,

$$Sticky_{i,t}$$

$$= Absolute\ value\ of\ \left(Log\left(\Delta\ Cost/\Delta\ Sales\right)_{i,\tau,up} - Log\left(\Delta\ Cost/\Delta\ Sales\right)_{i,\tau,down}\right),$$

Where,

τ, up is the most recent of the last four quarters with an increase in sales,

$\tau, down$ is the most recent of the last four quarters with a decrease in sales

$\Delta\, Sales_{i,t} = Sale_{i,t} - Sale_{i,t-1}$,

$\Delta\, Cost_{i,t} = Cost_{i,t} - Cost_{i,t-1}$,

$Cost_{i,t} = Sale_{i,t} - Earnings_{i,t}$

Thus, $Sticky$ is the difference between slope of the cost function of most recent quarter with sales increase out of the 4 recent quarters and the most recent quarter with sales decrease out of the 4 recent quarters. If cost structure is asymmetrical i.e., the change in cost when activity rises is not equal to change in costs when activity falls by an equivalent amount, then the measure has a positive value, and a higher value of $Sticky$ represents greater distance from symmetrical cost behaviour.

To measure demand for trade credit, there are two alternatives, viz., accounts payables as reported in the balance sheet, or days payables outstanding,[9] the average amount of time taken by the firm to pay its bills to suppliers. Out of these two, I use Days Payables Outstanding and log transform it. While increase in this measure reflects increase in demand for trade credit, increase in Accounts Payables might reflect either increase in managers' demand for trade credit or increase in the amount of credit purchases incurred by the firm. Therefore, this

[9] Days Payables Outstanding = (Accounts Payables / (Cost of Goods Sold/ 365), where Cost of Goods Sold is an aggregation of all costs incurred to produce the goods, including material, labour, and overheads.

measure, Log of Days Payables Outstanding (DPO henceforth), is a better measure of demand for trade credit than accounts payables reported in the balance sheet.[10]

3.2 Modelling demand for trade credit

3.2.1 Regression Models

I model firm's DPO as a function of $(Sticky)$. If it is true that managers compensate for an increase in agency costs due to information asymmetry arising out of slack and sticky costs by increasing their demand for trade credit, then I expect that coefficient on $Sticky$ will be positive (i.e., stickier costs, higher demand for trade credit). However, if managers of firms expect higher risks from trade credit transaction in face of sticky cost structure, then the expected positive effect will be weakened and the tests may reveal no impact on DPO due to increase in $Sticky$.

I run a multi-variate regression analysis to test this hypothesis and to document cross-sectional differences in this relationship. I use some firm level controls to control for some common causes that can bias the baseline regression analysis, and to increase the efficiency of my tests by controlling known determinants of demand for trade credit. I also control for various important characteristics of the firm's major supplier industry to assuage the concern that the results might be a supply side effect.

I use the following model to test Hypothesis 1:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(Sticky)_{i,t} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t} \quad (1)$$

Where,

[10] Even scaling Accounts Payables by Total Assets or Sales will not fully mitigate the concern that the scaled Accounts Payables is dependent on amount of credit purchases incurred by the firm.

$(DPO)_{i,t+1}$ is log of days payables outstanding based on cost of goods sold, the proxy for firm i's demand for trade credit at time t+1,

$(Sticky)_{i,t}$ is firm i's cost-stickiness at time t (Lagged cost stickiness),

$Controls_{n,i,t}$ is a vector of various controls (explained in next section) for firm specific characteristics that can plausibly impact the relationship between cost stickiness and trade credit,

α_I represents Industry (2 Digit SIC) fixed effects to control for all time invariant industry level characteristics that can plausibly impact the relationship between cost stickiness and trade credit,

And μ_t is time fixed effect to control for all time variant but firm invariant macroeconomic factor.

The coefficient of interest is β_1, estimate of which will establish the association between a firm's cost stickiness and its demand for trade credit.

To test for Hypotheses 2 and 3, I use the following general model:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(Sticky)_{i,t} + \beta_2(Sticky)_{i,t} * (Moderator)_{i,t} + \beta_3(Moderator)_{i,t} + \sum_{n=4}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t} \quad (2)$$

Model 2 is the same as Model 1, except that I augment it by an interaction term $(Sticky)_{i,t} * (Moderator)_{i,t}$. The coefficient on this interaction term, β_2 will show the cross-sectional differences in the relation between firm's demand for trade credit and its cost stickiness. A

significant β_2 will imply that the relationship varies with the level of moderator under study. All variations of this model are discussed in the respective results sections.

3.2.2 Control Variables

As stated earlier, I include three sets of control variables to the model. The first set captures firm's access to funds, a factor that can impact both, manager's demand for trade credit and the level of slack in the firm. Specifically, I add firms' age, size, long-term debt, cash holdings, whether the firm was loss making in that year, and Altman-Z score to the model to control for firm level differences in access to funds. The second set of control variables capture characteristics of time series of firm's earnings to empirically show that the impact of cost stickiness on demand for trade credit is not equivalent to the documented impact of characteristics of earnings time series on demand for trade credit. Specifically, I include predictability of firms' earnings (Francis et al., 2004), volatility of firms' earnings (Dichev & Tang, 2009), and unexpected part in firms' earnings (Bartov, 1992) to the model. The third set of variables capture supplier's incentive to supply trade credit. Specifically, I add supplier industry concentration, proportion of firms in the supplier industry with negative net income in the previous year, and proportion of firms in the supplier industry with negative sales growth in the previous year (Dass et al., 2015). Addition of these variables makes the regression analysis immune from bias in estimates due to firm level differences in suppliers' incentives to supply trade credit. Lastly, I add industry, captured by 2-digit SIC of the firm, and year fixed effects to the model. Thus, the analysis is within industry, within year, allaying the fear the results are because of some unobservable industry characteristic or some macroeconomic factor.

4. Data and Sample

I use data from various sources. The data on annual and quarterly firm financials are obtained from COMPUSTAT. The data on institutional ownership is obtained from Thomson Reuters. I identify the major supplier industry of the firm using Input/Output tables released by Bureau of Economic Affairs, USA.[11] Once major supplier industry is identified, I use COMPUSTAT to construct the control variables. For an additional test, I obtain monthly Federal Rates from the website of Federal reserve Bank of St. Louis.[12] To look at the impact of state level unemployment risk on the relationship between demand for trade credit and cost stickiness, I hand collect yearly state level unemployment insurance data from the "Significant Provisions of State UI Laws" published by the U.S. Department of Labour.[13] I then construct Unemployment Insurance Generosity for each state-year observation following the procedure in Agarwal and Matsa (2013). All variables are defined in Appendix A.

The summary statistics of the variables used in the analysis are reported in Table 1. The table documents that on average, DPO is 3.702 in the sample, which translates to 41 days payables outstanding. Further, average stickiness in the sample firms is 0.507. Table 2 reports the pairwise Pearson correlation coefficients. The correlation coefficient between $Sticky$ and DPO is 0.1 and is significant at 10% level.

[11] Available at: https://www.bea.gov/industry/io_annual.htm
[12] Available at: https://fred.stlouisfed.org/series/FEDFUNDS
[13] Available at: http://workforcesecurity.doleta.gov/unemploy/statelaws.asp

5. Results

5.1 Results for tests of Hypothesis 1

To test my first hypothesis on the impact of cost stickiness on demand for trade credit, I run variations of the model specified in Section 3. More specifically, I run Model 1:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(Sticky)_{i,t} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

The model includes all firm level controls, and industry and year fixed effects. I also identify the major supplier industry of the firm using Input/ Output (IO) tables released by Bureau of Economic Affairs, USA. IO Tables provide data on inputs and outputs to industries defined using NAICS Classification. I use the data on inputs to identify the most important supplier industry for each buyer industry. Thereafter, I include certain observable industry conditions to proxy for supply side forces that can influence realized demand of trade credit and managers' investment in slack. Again, the assumption is that in absence of identified buyer-supplier dyads, industry conditions are the best possible proxies to control for suppliers' incentives to supply more trade credit. I use COMPUSTAT to construct three control variables that capture the demand uncertainty in the supplier industry. The control variables are: $Supplier\_HHI$, market concentration in supplier industry; $Supplier\_SalesDrop$, ratio of number of firms with negative sales growth to total number of firms in the major supplier industry; and $Supplier\_LossFrac$, ratio of number of firms with reported losses to total number of firms in the major supplier industry. The standard errors are clustered at industry-year level. The results are documented in Column 1 of Table 3. The coefficient of interest, β_1, is positive and significant, consistent with the hypothesis. These results are not only statistically significant

but are also economically meaningful. A 1 standard deviation increase in Sticky increases DPO by 0.0535 standard deviations, or 10% of DPO's standard deviations.[14,15]

Next, I follow the procedure mentioned in Section 3.1 to measure stickiness of two major cost categories, Cost of Goods Sold (COGS), and Selling, General, & Administration Costs (SG&A). While COGS captures the costs directly related to production and processes, SG&A captures indirect costs related to sales and administration. Ex-ante, I do not make any differential predictions on the sensitivity of demand for trade credit to these two cost categories. However, results are revealing. I find that while stickiness of COGS ($Sticky\_COGS$) is positively and significantly related to demand for trade credit, stickiness of SG&A ($Sticky\_SGA$) impacts demand for trade credit negatively in the analysed sample. Note that, information advantage of suppliers arises because they know the firm's operations better and COGS accounts for the operations related slack. In contrast, SG&A slack is less closely related to production. This result, therefore, furthers the conjecture that suppliers' information advantage drives the positive relation between stickiness and demand for trade credit. The models used for this analysis are:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(StickySGA)_{i,t} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$, and

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(StickyCOGS)_{i,t} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

[14] This effect is calculated as:
(estimated coefficient) × (standard deviation of Sticky) / (standard deviation of DPO) ----------(A)
The percentage effect is calculated as: ((A) / standard deviation of DPO) *100

[15] I also run model 1 with all firm level controls and I augment it by controlling for unobserved industry-year level shocks by adding $Industry * Year$ fixed effects. The assumption is that yearly industry level shocks in either buyer or supplier industry will determine the incentives of suppliers to supply higher trade credit. I run three separate specifications. The first is with buyer industry-year fixed effects, the second is with supplier industry-year fixed effects, and the third one is with buyer industry, supplier industry, and year fixed effects. The coefficient of interest is positive and significant across all these specifications, consistent with hypothesis 1.

Column 6 of Table 3 documents the results of regression analysis of impact on SGA Stickiness on demand for trade credit. The model includes all firm level controls, supplier industry controls, and industry and year fixed effects, the standard errors are clustered at 2-digit SIC-Year level. The coefficient of interest β_1 is negative and significant. Likewise, Column 7 of Table 3 documents the results of regression analysis of impact on COGS Stickiness on demand for trade credit. The model includes all firm level controls, supplier industry controls, and industry and year fixed effects, the standard errors are clustered at 2-digit SIC-Year level. The coefficient of interest is β_1 which is positive and significant, consistent with the hypothesis.

One of the concerns is that cost stickiness is not a completely irrational phenomenon and that there are parts of it which are perceived to be good. The perceived normal stickiness should not lead to an increase in information asymmetry between the firm and its lenders. Thus, managers should have no incentive to demand higher trade credit if the stickiness is perceived to be value maximising by the financiers. To test for this conjecture, I use industry level average stickiness as a proxy for value maximising stickiness. Using average industry stickiness at 2-Digit SIC level, I demean the firm-year cost stickiness measure (Section 3.1) and construct a measure of abnormal stickiness at firm-year level. I use this as the main variable of interest in this set of tests to check if results go through for abnormal stickiness, I run the following models and results are reported in Table 4:

In Column 1,

$$(DPO)_{i,t+1} = \beta_0 + \beta_1 Abs(DemeanedStickyInd)_{i,t} + \beta_2 Mean_{ind}(Sticky) + \sum_{n=3}^{n} \beta_n (Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

Where, $Abs(DemeanedStickyInd) = Absolute\ value\ of\ (Sticky - Mean_{ind}(Sticky))$

In Columns 2, 3, and 4,

$$(DPO)_{i,t+1} = \beta_0 + \beta_1\big(High\_(DemeanedSticky)\_Ind\boldsymbol{n}\big)_{i,t} + \beta_2 Mean_{ind}(Sticky) + \sum_{n=3}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

Where, $\big(High\_(DemeanedSticky)\_Ind\boldsymbol{n}\big)$ is an indicator variable that takes value 1 if $Abs(DemeanedStickyInd)$ is in the top 3 (2, 1) deciles of $Abs(DemeanedStickyInd)$ and 0 otherwise in Column 3 (4, 5). Across all specifications, I find that only abnormal stickiness is positive and significant while normal stickiness is not significant. Further, the demand for trade credit is monotonically increasing in distance of stickiness from industry mean. This is consistent with the conjecture that the mean stickiness that is uncommon across all the firms in the industry drives the result on association between cost stickiness and demand for trade credit.

Next, in another test to confirm the conjecture that abnormal cost stickiness drives the result, I study the impact of cost stickiness not explained by labour unemployment risk on the demand for trade credit. I manually collect the amount of annual Unemployment Insurance (UI) benefits for each state from the "Significant Provisions of State UI Laws" published by the U.S. Department of Labour. While the basic framework of the UI provisions is decided by a joint federal-state system, the actual amounts are decided by states. Hence, states significantly vary on how generous they are to the unemployed citizens. I use two specific parameters from the provisions, maximum number of weeks an unemployed person is eligible for unemployment insurance (A), and the maximum amount of unemployment benefit that an unemployed subject can get per week (B). The maximum unemployment insurance benefit a person can get is (A)X(B). I take log of this value and name the variable $LogUnempInGenerosity$. Higher the value of this variable, lower is the unemployment risk, and lower resource adjustment cost of labour, thus lower the value maximising expected cost stickiness (Kim & Wang, 2014).

Thus, one can conjecture that stickiness explained by unemployment insurance generosity is stickiness due to expected reasons while any stickiness unexplained by this variable is private information of the managers. Higher the unexplained portions, higher the information asymmetry. I posit that this unexplained part drives the relationship between demand for trade credit and cost stickiness.

Results are reported in Table 5. Column 1 reports the results for the following specification:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(UnExplainedSticky)_{i,t} + \beta_2(ExplainedSticky) + \sum_{n=3}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

Where, $ExplainedSticky$ is the predicted value of Stickiness from regression of $Sticky$ on $LogInsuranceGenerosity$, and $UnExplainedSticky$ is the error from that regression

Column 2 reports the results for the following specification:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(UnExplainedSticky)_{i,t} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

Column 3 (4, 5) report the results for the following specification:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(High\_UnExplainedSticky\_Ind\boldsymbol{n})_{i,t} + \beta_2(ExplainedSticky) + \sum_{n=3}^{n} \beta_n(Controls)_{n,i,t} + \alpha_i + \mu_t + \varepsilon_{i,t}$$

Where $(HighUnExplainedSticky\_Ind\boldsymbol{n})$ is an indicator variable that takes value 1 if $UnExplainedSticky$ is in the top 3 (2, 1) deciles of $UnExplainedSticky$ and 0 otherwise in Column 3 (4, 5).

In all the columns, coefficient of $UnExplainedSticky/\ High\_UnExplainedSticky\_Ind\boldsymbol{n}$ is significant and positive. In contrast, the coefficient of $ExplainedSticky$ is insignificant in all the four specifications where it is included. The result is once again consistent with the reasoning that it is the part of stickiness which cannot be explained by known factors that leads to managers demanding more trade credit.

The results documented in this section conclusively show that information asymmetry associated with stickier costs is associated with higher demand for trade credit. This is consistent with managers reaching out to supply chain finance to benefit from the lower information asymmetry between the firm and its suppliers.

In hypothesis 2 and 3, I posit that the result in tests of hypothesis 1 should be weaker for firms where the quality of public information set is better and for firms where monitoring mechanisms that can limit managerial opportunism in investing in slack are stronger, respectively. The next set of tests are an exercise to test these hypotheses.

5.2 Results for tests of Hypothesis 2

In this section, I test for hypothesis 2. The conjecture is that if external financiers understand the firm better then managers will approach them first. To test this hypothesis, I use the following model:

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(Sticky)_{i,t} + \beta_2(Sticky)_{i,t} * (Moderator)_{i,t} + \beta_3(Moderator)_{i,t} + \sum_{n=4}^{n} \beta_n(Controls)_{n,i,t} + \alpha_i + \mu_t + \varepsilon_{i,t}$$

To operationalise quality of public information set, I select four moderators: Size, Age, Spread, and Sales Growth.

Column 1 (2, 3, 4) of Table 6 documents the results for moderator Size (Age, Spread, Sales Growth). The coefficient of interest, β_2, is negative and significant in Column 1 & 2, and positive and significant in Column 3 & 4, consistent with the hypothesis that firms which are smaller, are younger, have higher bid-ask spread, or have higher sales growth increase their demand for trade credit more.

Thus, the results in this section suggest that hypothesis 2 is reasonably supported by the data. If size, age, bid ask spread, and sales growth capture the quality of firm's public information, then the result is consistent with the hypothesis that lower the quality of public information, higher the asymmetry arising from cost stickiness between the firm and its external financiers, and therefore, higher the demand for trade credit.

5.3 Results for tests of Hypothesis 3

In this section, I test hypothesis 3. The conjecture is that if external monitors can monitor the agency related issues inherent in cost stickiness, then information asymmetry arising due to cost stickiness will not be high, and managers will be able to raise funds from normal channels despite costs becoming stickier. To operationalise the quality of external monitors, I select four moderators: Big4, a dummy variable that takes value 1 if the firm is audited by one of the Big audit firms and 0 otherwise; AnalystCov, measured as log of number of analysts following a firm; Diffused, a variable equal to 1-institutional ownership proportion in a firm; and TotalDebt, measured as long term debt scaled by total assets. The model that I use is similar to one used in section 5.2.

$$(DPO)_{i,t+1} = \beta_0 + \beta_1(Sticky)_{i,t} + \beta_2(Sticky)_{i,t} * (Moderator)_{i,t} + \beta_3(Moderator)_{i,t} + \sum_{n=4}^{n} \beta_n(Controls)_{n,i,t} + \alpha_I + \mu_t + \varepsilon_{i,t}$$

Table 7 documents the results of this analysis. The coefficient of interest is β_2, is negative and significant in columns 1,3, & 4, and positive and significant in Column 2, consistent with the expectations. The results show that manager's demand for trade credit increases to a lower extent if strong monitors monitor the manager and limit her opportunities to make value-destroying investments in slack.

5.4 Results for additional analyses and robustness tests

So far, I have documented that higher cost stickiness leads to managers demanding more trade credit and that this relationship is moderated by quality of firm's public information set and quality of firm's monitors. In this section, I discuss the robustness of my findings. The results are reported in Table 8. Panel A reports the tests with alternate measures of stickiness and Panel B reports the tests with alternate measures of the dependent construct, demand for trade credit.

Results in panel A show that the documented positive relation is not an artefact of using 4 quarters of data to measure cost stickiness. I use 8 (20) quarters of data to measure stickiness for the test reported in column 1 (2) of the panel. It can be clearly observed that the results are qualitatively similar. Thus, the positive relation between demand for trade credit and cost stickiness is obtained even when stickiness is measured using data from extended time periods.

Similarly, results in Panel B show that the documented relationship is not an artefact of my choice to deflate Accounts Payable by Cost of Goods Sold. In column 1 (2,3) I document the results for the model with sales (raw material inventory, accounts receivables) as the deflator instead of Cost of Goods Sold. It is evident that the results are qualitatively similar. Therefore, the positive relation between demand for trade credit and cost stickiness is obtained even when Days Payables Outstanding are calculated using 3 alternate deflators, viz., sales, raw-material inventory, and accounts receivables. Thus the results are robust to changing variable definitions.

6. Conclusion

In this paper, I look at impact of cost stickiness on demand for trade credit. Using multi-variate regression analysis augmented with controls from the major supplier industry, and industry and year fixed effects, I provide strong evidence that stickier costs lead to higher demand for trade credit (Section 5.1). The cross-sectional tests further establish that the significance of the quality of firm's publicly available information and quality of monitors moderate this relationship.

Overall, the findings imply that manager's financing decisions are impacted by cost stickiness, a consequence of managers' investment in slack. While research has documented that higher cost stickiness leads to higher bond yield spreads and credit risk due to cost stickiness (Chou et al., 2015; Homburg et al., 2016), I show that managers reach out to their suppliers who have more information about manager's decision to retain slack when the firm's costs become stickier. By documenting a specific setting, cost stickiness, where supply chain finance becomes more lucrative due to suppliers' information advantage, I also complement the rich literature on managers' choice of private lenders, which finds that managers do this to benefit from private lenders' information accessing and processing capabilities (Bharath et al., 2008; Diamond, 1984, 1989; Fama, 1985; Slovin et al., 1992).

The analysis also provides evidence that impact of cost stickiness on demand for trade credit is significant even if one controls various proxies of accounting quality in the regressions, complementing the findings in D. Chen et al. (2017) who documented that financial reporting quality is negatively related to demand for trade credit. The results, therefore, indicate that cost structure is more than just a determinant of earnings of a firm (Anderson et al., 2003; R. Banker & Byzalov, 2014; Chou et al., 2015; Homburg et al., 2016; Weiss, 2010). Furthermore, the study is an answer to the call in Banker and Byzalov (2014) to empirically look at the good and

bad components of stickiness and their differential impact on managerial decision making. I document that good cost stickiness does not impact demand for trade credit, while bad cost stickiness increases manager's demand for trade credit.

The findings also contribute to the literature on reasons behind demand for trade credit. While research documents that demand for trade credit increases in both macroeconomic and firm specific credit rationing (Abdulla et al., 2017; Garcia-Appendini & Montoriol-Garriga, 2013; Petersen & Rajan, 1997), I document that stickier costs is a situation where a supplier can act as an information intermediary between the firm and its other financiers due to her information advantage in understanding firm's operations, and, therefore, manager demands more trade credit as costs become stickier.

Lastly, this paper makes two contributions to research on slack. First, by documenting its impact on firm's short term financing, it extends the literature on consequences of slack, which has primarily focussed on slack's impact on firm performance (Daniel et al., 2004) and innovation (Nohria & Gulati, 1996). Second, I propose to use Weiss' (2010) measure of stickiness to measure resource slack. While slack has been measured using crude accounting measures like SG&A expenses without considering the impact of change in sales activity, measuring cost stickiness considers changes in resource levels in conjunction with changes in sales activity. This makes cost stickiness a more precise measure of slack.

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Table 1- Summary Statistics

The sample includes firm-year observations between 1985-2015. The data is obtained from various sources. Firm level and supplier industry financial information is from COMPUSTAT, Analyst Coverage data from IBES, firm level ownership data from Thomson Reuters, major supplier identity from IO Tables from the website of Bureau of Economic Affairs (USA), Fed Rates from the website of Federal Reserve Bank of St. Louis. Firm level cost stickiness has been calculated by following the algorithm provide by (Weiss, 2010). The table presents mean, 75th, 50th, & 25th percentile (P75, P50, P25 respectively), and standard deviation (SD) for the variables. Variables, if not self-explanatory, are described in Appendix A. All continuous variables are winsorized at the 1st and the 99th percentile.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	N	Mean	P75	P50	P25	SD
DPO	32,649	3.702	4.031	3.706	3.370	0.553
Sticky	32,649	0.507	0.657	0.279	0.104	0.620
Predictability	32,649	0.173	0.259	0.067	0.011	0.223
Earn_Volatility	32,649	38.810	16.010	3.716	1.169	256.000
Earn_UnExpected	32,649	-0.017	0.012	0.001	-0.013	0.158
CashHolding	32,649	0.390	0.819	0.124	0.043	0.396
AltmanZ	32,649	0.314	0.500	0.310	0.123	0.229
TotalDebt	32,649	0.005	0.001	0.000	0.000	0.016
PriceCostMargin	32,649	0.132	0.189	0.070	0.020	0.157
Size	32,649	0.034	0.040	0.028	0.020	0.029
Age	32,649	0.176	0.270	0.141	0.021	0.181
Supplier_HHI	32,649	1.134	1.189	0.389	0.091	2.338
Supplier_Salesdrop	32,649	5.821	7.001	5.542	4.338	1.860
Supplier_LossFrac	32,649	21.650	32.000	18.000	9.000	14.840

Table 2- Pairwise Correlations

This table presents Pearson (Spearman) correlations below the diagonal among all variables used in the main analysis. Detailed variable definitions are reported in Appendix A.* shows the significance at the 0.1 level.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) DPO	1.000													
(2) Sticky	0.100*	1.000												
(3) Age	-0.063*	-0.042*	1.000											
(4) Size	0.160*	-0.031*	0.413*	1.000										
(5) CashHolding	0.107*	0.132*	-0.159*	-0.137*	1.000									
(6) AltmanZ	-0.090*	-0.014*	-0.102*	-0.151*	0.422*	1.000								
(7) TotalDebt	-0.029*	0.000	0.015*	0.157*	-0.370*	-0.397*	1.000							
(8) Earn_Predictability	0.005	-0.017*	-0.087*	-0.007	0.130*	0.220*	-0.116*	1.000						
(9) Earn_Volatility	0.132*	0.017*	0.112*	0.302*	-0.011*	-0.054*	0.005	-0.024*	1.000					
(10) Earn_UnExpected	-0.010*	-0.054*	0.025*	0.000	0.033*	0.080*	-0.015*	-0.015*	0.008	1.000				
(11) PriceCostMargin	0.113*	0.031*	0.024*	0.085*	0.094*	0.047*	-0.069*	0.019*	0.053*	0.003	1.000			
(12) Supplier_HHI	0.166*	0.105*	-0.150*	-0.119*	0.259*	0.138*	-0.152*	0.077*	-0.012*	0.003	0.166*	1.000		
(13) Supplier_SalesDrop	-0.041*	-0.029*	0.023*	-0.006	-0.067*	-0.048*	0.040*	-0.017*	-0.013*	-0.035*	0.049*	-0.150*	1.000	
(14) Supplier_Lossfrac	-0.116*	-0.052*	0.030*	0.024*	-0.029*	0.020*	0.018*	-0.047*	-0.013*	0.008	-0.087*	-0.107*	0.088*	1.000

Table 3- Results for Hypothesis 1: Impact of stickier cost on demand for trade credit

This table reports the results from the regression analysis based on variants of the specification $(DPO)_{i,t} = \beta_0 + \beta_1(Sticky)_{i,t-1} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t-1} + \alpha_I + \mu_t + \varepsilon_{i,t}$, in columns 1-5, variations are explained in the table. Column 6 & 7 report the results for impact of StickySGA & StickyCOGS on DPO. The sample consists of all firm-years between 1985 and 2015 that have data available for calculating all the variables used in the multivariate regression analysis. The reasons for including these specific controls are provided in Section 3.2.2. Cluster robust standard errors are reported, level of clustering and fixed effects used are reported in the table. All variables are defined in Appendix A.

	(1)	(2)	(3)
VARIABLES	DPO	DPO	DPO
Sticky	0.0478***		
	(0.00499)		
StickySGA		-0.00960***	
		(0.00371)	
StickyCOGS			0.0204***
			(0.00610)
Age	-0.00493***	-0.00483***	-0.00484***
	(0.000271)	(0.000285)	(0.000285)
Size	0.0570***	0.0592***	0.0598***
	(0.00327)	(0.00334)	(0.00334)
CashHolding	0.283***	0.252***	0.245***
	(0.0277)	(0.0311)	(0.0310)
AltmanZ	-2.771***	-3.324***	-3.315***
	(0.199)	(0.243)	(0.241)
TotalDebt	-0.0852***	-0.0912***	-0.0933***
	(0.0216)	(0.0246)	(0.0246)
Earn_Predictability	-0.00637	-0.00284	-0.00535
	(0.0153)	(0.0172)	(0.0172)
Earn_Volatility	0.000155***	0.000120**	0.000120**
	(5.91e-05)	(4.69e-05)	(4.66e-05)
Earn_UnExpected	-4.41e-08***	-1.93e-05***	-2.01e-05***
	(2.76e-09)	(5.84e-06)	(5.96e-06)
PriceCostMargin	0.00389***	0.00543***	0.00541***
	(0.00148)	(0.00166)	(0.00166)
Supplier_HHI	0.0956***	0.115***	0.113***
	(0.0125)	(0.0149)	(0.0148)
Supplier_SalesDrop	-0.0188	-0.00114	-0.00106
	(0.0224)	(0.0255)	(0.0254)
Supplier_LossFrac	0.127	0.109	0.100
	(0.240)	(0.258)	(0.257)
Fixed Effects	Ind, Year	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year	Ind*Year
Observations	32,649	23,678	23,678
R-squared	0.185	0.190	0.191

*** p<0.01, ** p<0.05,
* p<0.1

Table 4- Analysis based on demeaned stickiness

This table reports the results from the regression analysis based on variants of the specification mentioned in Section 5.4.3, major change being the use of demeaned stickiness instead of total stickiness. The sample consists of all firm-years between 1985 and 2015 that have data available for calculating all the variables used in the multivariate regression analysis and that have an identifiable major supplier industry in I/O Tables by Bureau of Economic Affairs, U.S.A. The reasons for including these specific controls are provided in Section 3.2.2. Cluster-robust standard errors are reported, level of clustering is reported in the table. All variables are defined in Appendix A.

VARIABLES	(1) DPO	(2) DPO	(3) DPO	(4) DPO
Abs(DemeanedSticky_Ind)	0.0478***			
	(0.00508)			
High_DemeanedSticky_Ind		0.0470***		
		(0.00600)		
HighDemeanedSticky_Ind1			0.0523***	
			(0.00644)	
HighDemeanedSticky_Ind2				0.0500***
				(0.00707)
MeanSticky	-0.0536	-0.0532	-0.0524	-0.0532
	(0.0359)	(0.0358)	(0.0357)	(0.0358)
Age	-0.00494***	-0.00496***	-0.00496***	-0.00495***
	(0.000271)	(0.000272)	(0.000271)	(0.000271)
Size	0.0571***	0.0569***	0.0568***	0.0566***
	(0.00326)	(0.00328)	(0.00328)	(0.00327)
CashHolding	0.283***	0.292***	0.291***	0.295***
	(0.0276)	(0.0279)	(0.0277)	(0.0277)
AltmanZ	-2.774***	-2.782***	-2.783***	-2.796***
	(0.200)	(0.200)	(0.200)	(0.201)
TotalDebt	-0.0848***	-0.0823***	-0.0823***	-0.0811***
	(0.0216)	(0.0215)	(0.0215)	(0.0216)
Earn_Predictability	-0.00596	-0.00845	-0.00790	-0.00815
	(0.0153)	(0.0153)	(0.0152)	(0.0153)
Earn_Volatility	0.000155***	0.000156***	0.000156***	0.000156***
	(5.91e-05)	(5.95e-05)	(5.96e-05)	(5.97e-05)
Earn_UnExpected	-4.43e-08***	-4.64e-08***	-4.75e-08***	-4.18e-08***
	(2.75e-09)	(2.75e-09)	(2.75e-09)	(2.77e-09)
PriceCostMargin	0.00386***	0.00375***	0.00378***	0.00376***
	(0.00144)	(0.00145)	(0.00145)	(0.00145)
Supplier_HHI	0.0961***	0.0972***	0.0974***	0.0982***
	(0.0125)	(0.0126)	(0.0125)	(0.0126)
Supplier_SalesDrop	-0.0184	-0.0198	-0.0197	-0.0199
	(0.0222)	(0.0223)	(0.0223)	(0.0223)
Supplier_LossFrac	0.118	0.101	0.103	0.102
	(0.240)	(0.241)	(0.241)	(0.241)
Fixed Effects	Ind, Year	Ind, Year	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year	Ind*Year	Ind*Year
Observations	32,649	32,649	32,649	32,649
R-squared	0.185	0.184	0.184	0.184

Robust standard errors in parentheses
*** p<0.01, ** p<0.05,
* p<0.1

Table 5- Analysis based on unexplained stickiness

This table reports the results from the regression analysis based on variants of the specification mentioned in Section **5.4.3**, major change being the use of unexplained stickiness instead of total stickiness. The sample consists of all firm-years between 1985 and 2015 that have data available for calculating all the variables used in the multivariate regression analysis, have an identifiable major supplier industry in I/O Tables by Bureau of Economic Affairs, U.S.A, and have unemployment benefits data available from US Department of Labor. The reasons for including specific controls are provided in Section 3.2.2. Cluster-robust standard errors are reported, level of clustering is reported in the table. All variables are defined in Appendix A.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	DPO	DPO	DPO	DPO	DPO
UnExplainedSticky	0.0501***	0.0499***			
	(0.00546)	(0.00544)			
High_UnExplainedSticky_Ind			0.0244***		
			(0.00594)		
High_UnExplainedSticky_Ind1				0.0320***	
				(0.00638)	
High_UnExplainedSticky_Ind2					0.0415***
					(0.00712)
ExplainedSticky	-0.0214		-0.00516	-0.00696	-0.00668
	(0.0328)		(0.0330)	(0.0329)	(0.0329)
Age	-0.00355***	-0.00355***	-0.00357***	-0.00357***	-0.00357***
	(0.000254)	(0.000255)	(0.000255)	(0.000255)	(0.000254)
Size	0.0462***	0.0462***	0.0457***	0.0457***	0.0458***
	(0.00269)	(0.00269)	(0.00271)	(0.00271)	(0.00272)
CashHolding	0.292***	0.292***	0.315***	0.313***	0.310***
	(0.0273)	(0.0273)	(0.0273)	(0.0274)	(0.0274)
AltmanZ	-2.416***	-2.416***	-2.468***	-2.456***	-2.449***
	(0.190)	(0.190)	(0.194)	(0.194)	(0.193)
TotalDebt	-0.0102	-0.0102	-0.00457	-0.00433	-0.00471
	(0.0208)	(0.0208)	(0.0207)	(0.0207)	(0.0207)
Earn_Predictability	-0.000622	-0.000574	-0.00431	-0.00444	-0.00417
	(0.0155)	(0.0155)	(0.0156)	(0.0155)	(0.0155)
Earn_Volatility	0.000111**	0.000111**	0.000112**	0.000112**	0.000112**
	(4.83e-05)	(4.84e-05)	(5.01e-05)	(4.98e-05)	(4.98e-05)
Earn_UnExpected	-4.80e-08***	-4.79e-08***	-4.55e-08***	-4.56e-08***	-4.57e-08***
	(2.85e-09)	(2.84e-09)	(2.92e-09)	(2.91e-09)	(2.90e-09)
PriceCostMargin	0.00377**	0.00384**	0.00365**	0.00365**	0.00364**
	(0.00177)	(0.00177)	(0.00179)	(0.00178)	(0.00178)
Supplier_HHI	0.101***	0.101***	0.104***	0.104***	0.103***
	(0.0118)	(0.0118)	(0.0120)	(0.0120)	(0.0119)
Supplier_SalesDrop	-0.00903	-0.00957	-0.0115	-0.0114	-0.0112
	(0.0216)	(0.0216)	(0.0218)	(0.0218)	(0.0218)
Supplier_LossFrac	0.112	0.110	0.0852	0.0867	0.0856
	(0.264)	(0.264)	(0.265)	(0.265)	(0.265)
Fixed Effects	Ind, Year	Ind, Year	Ind, Year	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year	Ind*Year	Ind*Year	Ind*Year
Observations	29,554	29,554	29,554	29,554	29,554
R-squared	0.163	0.163	0.161	0.161	0.161

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, *
p<0.1

Table 6- Results for Hypothesis 3: Importance of information from supply chain

This table reports the results from the regression analysis based on variants of the specification $(DPO)_{i,t} = \beta_0 + \beta_1(Sticky)_{i,t-1} + \beta_2(Sticky)_{i,t-1} * (Moderator)_{i,t-1} + \beta_3(Moderator)_{i,t-1} + \sum_{n=4}^{n} \beta_n(Controls)_{n,i,t-1} + \alpha_I + \mu_t + \varepsilon_{i,t}$, all variations explained in the table. Moderators include: Size, Age, Spread, SalesGrowth. $Controls$ include major supplier industry characteristics. The sample consists of all firm-years between 1985 and 2015 that have data for calculating all the variables used in the multivariate regression analysis and that have an identifiable major supplier industry in I/O Tables by Bureau of Economic Affairs, U.S.A. The reasons for including these specific controls are provided in Section 3.2.2. The specific moderator used in each specification is explained in Section **5.2**. Cluster-robust standard errors are reported, level of clustering and fixed effects used are reported in the table. All variables are defined in Appendix A.

	(1)	(2)	(3)	(4)
VARIABLES	DPO	DPO	DPO	DPO
Sticky	0.140***	0.0729***	0.0889***	0.0470***
	(0.0177)	(0.00862)	(0.0182)	(0.00498)
Sticky*Size	-0.0163***			
	(0.00290)			
Sticky*Age		-0.00124***		
		(0.000319)		
Sticky*Spread			0.00754**	
			(0.00358)	
Sticky*SalesGrowth				0.000767***
				(8.47e-05)
Spread			-0.00602	
			(0.00635)	
SalesGrowth				-0.000921***
				(0.000136)
Age	-0.00493***	-0.00432***	-0.00512***	-0.00492***
	(0.000272)	(0.000283)	(0.000280)	(0.000270)
Size	0.0651***	0.0570***	0.0593***	0.0570***
	(0.00349)	(0.00328)	(0.00567)	(0.00327)
CashHolding	0.278***	0.280***	0.247***	0.282***
	(0.0276)	(0.0277)	(0.0288)	(0.0277)
AltmanZ	-2.745***	-2.768***	-2.822***	-2.781***
	(0.198)	(0.199)	(0.193)	(0.199)
TotalDebt	-0.0834***	-0.0857***	-0.113***	-0.0855***
	(0.0217)	(0.0216)	(0.0230)	(0.0215)
Earn_Predictability	-0.00680	-0.00632	-0.00651	-0.00612
	(0.0152)	(0.0152)	(0.0177)	(0.0152)
Earn_Volatility	0.000158**	0.000156***	0.000154**	0.000155***
	(6.13e-05)	(5.99e-05)	(6.75e-05)	(5.91e-05)
Earn_UnExpected	-0.0100	-0.00984	-0.0334	-0.0101
	(0.0216)	(0.0216)	(0.0287)	(0.0216)
PriceCostMargin	0.00401***	0.00396***	0.00308**	0.00392***
	(0.00149)	(0.00148)	(0.00134)	(0.00149)
Supplier_HHI	0.0961***	0.0952***	0.116***	0.0962***
	(0.0125)	(0.0125)	(0.0134)	(0.0125)
Supplier_SalesDrop	-0.0194	-0.0180	0.00120	-0.0192
	(0.0224)	(0.0224)	(0.0246)	(0.0223)
Supplier_LossFrac	0.109	0.120	-0.118	0.141
	(0.240)	(0.240)	(0.249)	(0.237)
Fixed Effects	Ind, Year	Ind, Year	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year	Ind*Year	Ind*Year
Observations	32,649	32,649	23,698	32,617
R-squared	0.172	0.185	0.193	0.185

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7- Results for Hypothesis 3: Impact of alternate governance mechanisms

This table reports the results from the regression analysis based on variants of the specification $(DPO)_{i,t} = \beta_0 + \beta_1(Sticky)_{i,t-1} + \beta_2(Sticky)_{i,t-1} * (Moderator)_{i,t-1} + \beta_3(Moderator)_{i,t-1} + \sum_{n=4}^{n} \beta_n(Controls)_{n,i,t-1} + \alpha_I + \mu_t + \varepsilon_{i,t}$, all variations explained in the table. Moderators include: Big4, AnalystCoverage, Diffused, TotalDebt. $Controls$ include major supplier industry characteristics. The sample consists of all firm-years between 1985 and 2015 that have data for calculating all the variables used in the multivariate regression analysis and that have an identifiable major supplier industry in I/O Tables by Bureau of Economic Affairs, U.S.A. The reasons for including these specific controls are provided in Section 3.2.2. The specific moderator used in each specification is explained in Section **5.3**. Cluster-robust standard errors are reported, level of clustering and fixed effects used are reported in the table. All variables are defined in Appendix A.

VARIABLES	(1) DPO	(2) DPO	(3) DPO	(4) DPO
Sticky	0.0697***	0.0670***	0.0145	0.0687***
	(0.00948)	(0.0102)	(0.0114)	(0.00700)
Sticky*Big4	-0.0322***			
	(0.0112)			
Big4	0.0185**			
	(0.00808)			
Sticky*AnalystCov		-0.0161***		
		(0.00557)		
AnalystCov		0.0352***		
		(0.00644)		
Sticky*Diffused			0.0573***	
			(0.0212)	
Diffused			0.216***	
			(0.0209)	
Sticky*TotalDebt				-0.119***
				(0.0251)
Age	-0.00493***	-0.00389***	-0.00419***	-0.00492***
	(0.000272)	(0.000299)	(0.000320)	(0.000271)
Size	0.0569***	0.0482***	0.0739***	0.0570***
	(0.00340)	(0.00565)	(0.00403)	(0.00327)
CashHolding	0.284***	0.361***	0.348***	0.282***
	(0.0278)	(0.0316)	(0.0331)	(0.0278)
AltmanZ	-2.759***	-2.535***	-2.394***	-2.771***
	(0.200)	(0.196)	(0.227)	(0.199)
TotalDebt	-0.0841***	-0.0803***	-0.102***	-0.0137
	(0.0217)	(0.0239)	(0.0263)	(0.0258)
Earn_Predictability	-0.00694	-0.0156	-0.0220	-0.00618
	(0.0153)	(0.0160)	(0.0172)	(0.0153)
Earn_Volatility	0.000155***	0.000155**	0.000129**	0.000156***
	(5.93e-05)	(6.80e-05)	(5.58e-05)	(5.92e-05)
Earn_UnExpected	-4.48e-08***	-5.61e-07	-5.46e-08***	-4.30e-08***
	(2.78e-09)	(6.76e-05)	(3.53e-09)	(2.78e-09)
PriceCostMargin	0.00386***	0.00399**	0.00323**	0.00391***
	(0.00149)	(0.00165)	(0.00164)	(0.00150)
Supplier_HHI	0.0958***	0.0897***	0.120***	0.0959***
	(0.0125)	(0.0134)	(0.0142)	(0.0125)
Supplier_SalesDrop	-0.0206	-0.0245	-0.00151	-0.0190
	(0.0224)	(0.0229)	(0.0264)	(0.0224)
Supplier_LossFrac	0.123	0.0154	0.611**	0.137
	(0.240)	(0.269)	(0.276)	(0.240)
Fixed Effects	Ind, Year	Ind, Year	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year	Ind*Year	Ind*Year
Observations	32,619	25,673	20,028	32,649
R-squared	0.185	0.197	0.213	0.186

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, *
p<0.1

Table 8- Robustness tests: Alternate dependent and independent variable

Panel A

This panel reports the results from the regression analysis based on variants of the specification $(DPO)_{i,t} = \beta_0 + \beta_1(StickyN)_{i,t-1} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t-1} + \alpha_I + \mu_t + \varepsilon_{i,t}$,where N can be 8 or 20. The new independent variables extend the 4 quarter time limit in Weiss' (2010) method to 8 and 20 quarters respectively. The sample consists of all firm-years between 1985 and 2015 that have data available for calculating all the variables used in the multivariate regression analysis. The reasons for including these specific controls are provided in Section 3.2.2. Cluster robust standard errors are reported, level of clustering and fixed effects used are reported in the table. All variables are defined in Appendix A.

	(1)	(2)
VARIABLES	DPO	DPO
Sticky8	0.115***	
	(0.0121)	
Sticky20		0.115***
		(0.0121)
Age	-0.00494***	-0.00494***
	(0.000275)	(0.000275)
Size	0.0578***	0.0579***
	(0.00329)	(0.00330)
CashHolding	0.282***	0.282***
	(0.0273)	(0.0273)
AltmanZ	-2.853***	-2.851***
	(0.199)	(0.199)
TotalDebt	-0.0997***	-0.0995***
	(0.0219)	(0.0219)
Earn_Predictability	-0.00378	-0.00368
	(0.0153)	(0.0153)
Earn_Volatility	0.0001***	0.0001***
	(5.96e-05)	(5.96e-05)
Earn_UnExpected	-0.0000***	-0.0000***
	(2.78e-09)	(2.78e-09)
PriceCostMargin	0.00400**	0.00399**
	(0.00157)	(0.00157)
Supplier_HHI	0.1000***	0.100***
	(0.0125)	(0.0125)
Supplier_SalesDrop	-0.0218	-0.0216
	(0.0225)	(0.0224)
Supplier_LossFrac	0.112	0.112
	(0.238)	(0.238)
Fixed Effects	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year
Observations	32,318	32,318
R-squared	0.186	0.186

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, *
p<0.1

Panel B

This panel reports the results from the regression analysis based on variants of the specification $(DPON)_{i,t} = \beta_0 + \beta_1(Sticky)_{i,t-1} + \sum_{n=2}^{n} \beta_n(Controls)_{n,i,t-1} + \alpha_I + \mu_t + \varepsilon_{i,t}$,where N can be 2, 3, or 4. The new dependent variables are calculated by deflating payables by sales, raw material inventory, and receivables respectively. The sample consists of all firm-years between 1985 and 2015 that have data available for calculating all the variables used in the multivariate regression analysis. The reasons for including these specific controls are provided in Section 3.2.2. Cluster robust standard errors are reported, level of clustering and fixed effects used are reported in the table. All variables are defined in Appendix A.

VARIABLES	(1) DPO2	(2) DPO3	(3) DPO4
Sticky	0.0235***	0.0158*	0.0182***
	(0.00515)	(0.00937)	(0.00544)
Age	-0.00368***	-0.00301***	-0.00210***
	(0.000265)	(0.000606)	(0.000268)
Size	0.0275***	0.151***	0.0261***
	(0.00250)	(0.00700)	(0.00308)
CashHolding	0.0851***	0.485***	0.185***
	(0.0322)	(0.0552)	(0.0343)
AltmanZ	-4.874***	-3.567***	-3.524***
	(0.236)	(0.294)	(0.190)
TotalDebt	-0.0854***	-0.0179	0.168***
	(0.0229)	(0.0341)	(0.0267)
Earn_Predictability	0.000768	-0.149***	-0.0113
	(0.0142)	(0.0263)	(0.0168)
Earn_Volatility	2.18e-05**	0.000353***	2.63e-06
	(9.90e-06)	(0.000109)	(1.34e-05)
Earn_UnExpected	-0.0613***	-0.0564	-0.0384
	(0.0228)	(0.0398)	(0.0243)
PriceCostMargin	-0.00254	-0.00752***	-0.00457***
	(0.00185)	(0.00242)	(0.00153)
Supplier_HHI	0.0258**	0.220***	0.0435***
	(0.0127)	(0.0308)	(0.0152)
Supplier_SalesDrop	-0.00876	0.114*	0.0115
	(0.0211)	(0.0590)	(0.0268)
Supplier_LossFrac	0.0386	2.721***	0.314
	(0.210)	(0.791)	(0.262)
Fixed Effects	Ind, Year	Ind, Year	Ind, Year
Clustered Standard Errors	Ind*Year	Ind*Year	Ind*Year
Observations	32,645	26,771	32,632
R-squared	0.166	0.192	0.168

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix A
Variable Description

Variable Name	Description
DPO	Log (1+(Accounts Payables/(COGS)*365))
Saleq	Net Sales (Quarterly)
Earningsq	Income before extraordinary items (Quarterly)
Costq	Sales-Earnings
COGS	Cost of Goods Sold
SGA	Selling & General Administration Expenses
Lag_X_q(n)	nth Lag of X (Quarterly)
Del_X_q(n)	Change in X (Quarterly)
Sticky	Absolute Stickiness in Cost measured using process described in Section)
StickyCOGS	Absolute Stickiness in Cost of Goods Sold)
StickySGA	Lag(Absolute Stickiness in Selling & General Administration Costs)
Altman	Altman Z Score ((0.717*Working Capital/(Total Assets*100)) + (0.847*Retained Earnings/(Total Assets*100)) + (3.107*Earnings Before Interest and Taxes/(Total Assets*100))+ (0.42*Market Value of Equity/100) + (0.998*Sale/(Total Asset*100)))
TotalDebt	Long term debt/Total Assets
Size	Log(Total Assets)
Age	Log(1+(No. of years of Firm's records in COMPUSTAT))
Supplier_SalesDrop	Ratio of no. of firms in major supplier industry with negative sales growth to total no. of firms in the major supplier industry
Supplier_LossFrac	Ratio of no. of firms in major supplier industry with losses to total no. of firms in the major supplier industry
Supplier_HHI	Industry concentration (Herfindahl-Hirschman Index) of the major supplier industry
CashHolding	Cash and cash equivalent/Total Assets
HHI	Industry concentration (Herfindahl-Hirschman Index) based on 2 digit SIC (Sum of squares of market share of all firms in the peer group based on 2 digit SIC code)
Diffused	Ownership Diffusion calculated as (1-institutional ownership proportion)
FedR	Annual Fed Rate (Averaged using monthly fed rates)
DemeanedSticky_Ind	Sticky-Average Sticky at 2 Digit SIC level
Abs(DemeanedSticky_Ind)	Absolute value of DemeanedSticky_ind
Abs(DemeanedSticky_Ind)*Sticky	Absolute value of DemeanedSticky_ind * Sticky
LogUnempInGenerosity	Log(Unemployment benefit offered by State Governments), where Unemployment Benefit = Maximum Unemployment Benefit*Maximum number of weeks for which it can be availed, decided by each state government each year
ExplainedSticky	Predicted value of *Sticky* from regression of Sticky on *LogInsuranceGenerosity* by industry, year
UnExplainedSticky	Residual from regression of Sticky on *LogInsuranceGenerosity* by industry, year
Big4	Dummy that takes value=1 if the firm is audited by Big4 Auditor
Spread	Bid-Ask Spread on the closing date of last financial year
AnalystCov	Log(1+ no. of analysts used to calculate consensus 1-year EPS Forecast of the firm as given in the summary file of IBES)

Sales Growth	Change in Sale at time t/Lag(Sale) at time t
HighTech	Dummy that takes value=1 if the firm belongs to SIC2=28/35/36/38, 0 otherwise
HighFedR	Dummy that takes value=1 if the year =1995 or 2000, 0 if year=1994/1993/1998/1999
PriceCostMargin	Industry demeaned operating profit (Sale-COGS-XSGA)
Sticky*X	Interaction of Sticky and X, where X can be any one of Big4, AnalystCov, TotalDebt, Diffused, Size, Age, Spread, Sales Growth
DPO2	Log(1+(Accounts Payables/(Sale)*365))
DPO3	Log(1+(Accounts Payables/(RawMaterialInventory)*365))
DPO4	Log(1+(Accounts Payables/(AccountsReceivables)*365))
Sticky8	Lag(Absolute Stickiness in Cost measured using process described in Section but using 8 quarters of data)
Sticky20	Lag(Absolute Stickiness in Cost measured using process described in Section but using 20 quarters of data)