

Accounts Payable and Sales Growth Rate:

Evidence from Manufacturers under COVID-19 State of Emergency

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[Abstract]

A firm's sales growth implies higher bargaining power over its business counterpart, and this generates an increase in the use of accounts payable. This study investigates the association between the growth rate of accounts payable and that of sales under Japan's COVID-19 state of emergency. Using quarterly financial data of manufacturing companies, I conducted cross-sectional regression analyses and determined that the growth rate of accounts payable based on the same quarter of the previous fiscal year is positively related to the growth rate of sales. Additionally, the findings suggest that this positive relationship is more significant in firms with high accounts payable turnover (early payment) and those located in a competitive market.

1. INTRODUCTION

This paper examines the relation between the accounts payable growth rate and the sales growth rate by using the data from 175 Japanese manufacturing companies. Accounts payable is provided to buyer from supplier over the course of their business transactions. The firm with a delay of the payment for the purchase has the accounts payable as a short-term debt on their balance sheet. The accounts payable is widely used in the industries in which the businesses are mainly accompanied with the transactions of commodities.

Accounts payable is also utilized to provide liquidity to firm through the business transactions. Holding accounts payable indicates that firm can obtain a short-term maturity credit from supplier providing a postponement of payment (Ng et al., 1999; Giannetti et al., 2011; Klapper et al., 2012).¹⁾ Previous studies point out that firms with accounts payable which provides liquidity to firms can continuously undertake investments. Nam and Uchida (2019) find that, with 21,765 firms from 40

Key words : Accounts payable, Bargaining power, Manufacturers, COVID-19 state of emergency

countries database, accounts payable is positively related to the firm value during the global financial crisis from 2008 to 2009. The findings suggest that accounts payable which can supply liquidity avoids firm value reduction. Indeed, Cuñat (2007) argues that supplier provides additional liquidity to illiquid buyer through the accounts payable, and this liquidity provision function of holding accounts payable is described as a financial insurance of trade credit contract.²⁾ Moreover, supplier, which is giving a delay for payment over the business transactions, can monitor their buyer (Biais and Gollier, 1997; Petersen and Rajan, 1997). Burkart and Ellingsen (2004) theoretically show that, based on the business relationship accompanied with buyer's accounts payable, supplier can have the advantage of acquisition for buyer's information than financial institution has, besides the supplier's holding information is able to be transferred to bank.

Accounts payable containing both channels short-term liquidity provision and information production is built by the business relationship. This implies that the use of accounts payable is also influenced by the power balance between companies in the relationship. Wilner (2000) argues that the level of accounts payable depends on the power relation between supplier and buyer. In other words, bargaining power asymmetry among companies may affect the degree of firm relationship-based credit. Fabbri and Klapper (2016) document that supplier's trade credit (accounts receivable) is negatively related to supplier's bargaining power. On the other hand, the measure of bargaining power towards their business partner varies across previous literature. With a simple intuition, an increase of sales might hold a positive association with firm's bargaining power. However, in the previous empirical works, the sales growth rate is rarely used as a gauge of firm's bargaining power.³⁾

In this paper, I estimate whether the firm's bargaining power measured by the sales growth rate matters on the increase of accounts payable. Specifically, I find the relation between the accounts payable growth rate and the sales growth rate by using the sample including Japanese manufacturers during the period of COVID-19 state of emergency (from the April to June 2020) as an unpredictable external shock which causes sales decline. The findings show that the sales growth rate is positively associated with the accounts payable growth rate. Furthermore, the additional empirical results are confirmed when firms have high level of accounts payable turnover, and when firm's market faces competitive environment.

This paper contributes to the literature on the role of bargaining power (the sales growth rate) to the determinant of the accounts payable. This paper's findings on the positive relation between the growth rate of accounts payable and the firm's sales growth rate support the idea that supplier's bargaining power affects the accounts receivable (Fabbri and Klapper, 2016). Moreover, I obtain empirical results by applying the sample period with COVID-19 state of emergency, which takes advantage of external shock to examine the determinant of accounts payable. This evidence also makes contribution to the research investigating a means of liquidity supply channels based on firm's working capital management.

The article continues as follows. Section 2 describes previous literature and testable hypothesis. Section 3 presents the empirical methodology and data. Section 4 reports empirical results, and I conclude in Section 5.

2. Hypothesis

Biais and Gollier (1997) point out that supplier can obtain buyer's information including growth prospects by using buyer's accounts payable. Petersen and Rajan (1997) argue that supplier gives the trade credit to their buyer holding accounts payable as a means of price discrimination among buyers. Moreover, Petersen and Rajan (1997) postulate that having accounts payable is relying on buyer's prospects of future profits. Therefore, it is implied that the use of accounts payable is likely to depend on firm's business prospects.

Meanwhile, Wilner (2000) theoretically shows that firm's bargaining power affects the use of accounts payable. With respect to the bargaining power, Wilner (2000) notes that buyer receives benefit regarding the accounts payable by taking advantage of their bankruptcy risks. In other words, supplier is likely to provide financially distressed buyer with more concessions in the trade credit contract to avoid the loss of business relationship. Giannetti et al. (2011) document that the bargaining power (e.g., high logarithm of total assets, and holding large numbers of suppliers) drives the favorable treatment in accounts payable contract terms (e.g., early payment discount) from the buyer's perspective. In a similar vein, Klapper et al. (2012) find that firms such as large buyer, and buyer with investment grade, receive contracts with longer maturities from small suppliers. In addition, to test that supplier's provision of trade credit, Fabbri and Klapper (2016) use bargaining power measured by the portion of sales in supplier's profit and the product characteristics (i.e., standardization for specific buyer's needs).

Overall, recent studies argue that firm's bargaining power is related to the level of accounts payable. However, the definition of the bargaining power varies widely among the related literature. In the meantime, firm's growth prospect is likely to be captured by its sales growth rate. I presume that the sales growth rate is a gauge of firm's future growth, and simultaneously proxied for its bargaining power for the business transaction.⁴⁾ Thus, firm's bargaining power gauged by the sales growth rate could affect the increase of accounts payable. Given the implication of this section, I test the relation between the sales growth rate and accounts payable growth rate with the following prediction:

Hypothesis 1.

Sales growth rate is positively associated with accounts payable growth rate.

3. Methodology and data

This paper tests the relation between the sales growth rate and accounts payable growth rate with the quarterly based financial data during the period of Japan's COVID-19 state of emergency (from April to June 2020).⁵⁾ The dependent variable is the accounts payable growth rate based on the same quarter of previous fiscal year. Identically, the same quarter-based sales growth rate is adopted as the key independent variable. Both growth rates computed by the quarterly basis reduce the concern of seasonal bias especially in manufacturing industries. I predict that the positive relation between the sales growth rate and accounts payable growth rate. Specifically, I estimate the following equation.

$$APGR_i = \beta_1 SGR_i + X_i' \phi + \varepsilon_i \quad (1)$$

For the control variables (X), I include the natural logarithm of total assets (SIZE) to control size effects on accounts payable. Inventory over total assets (INVENTORY), cash and cash equivalent scaled by total assets (CASH), and the accounts receivable divided by total assets (ACCREC) are used as the control variables, since these variables affect the level of accounts payable as components of firm's working capital (Atanasova, 2007). Firm's leverage is negatively associated with short-term debt growth rate, I add the leverage (total liabilities over total assets). Firm with high investment opportunity holds more accounts payable as various liquidity channels (Fisman and Love, 2003). I use Tobin's Q as a proxy for firm's investment opportunity. The computation of Tobin's Q varies widely across the literature, in this paper, the Tobin's Q calculated as the sum of the market value of equity and the book value of debt divided by the book value of total assets. All variables are winsorized at the top and bottom 1% levels (except for dummy variables).

I collect the data on a quarterly basis, unconsolidated financial information from the QUICK Astra Manager. According to the earlier studies that argue accounts payable is widely used in manufacturers (Petersen and Rajan, 1997; Ng et al., 1999), this paper solely includes firms classified in 16 manufacturing industries of TOPIX 33-sectors classification.⁶⁾ As a result, the sample in this paper consists of 175 manufacturers.

Table 1

Summary statistics

This table presents summary statistics for sample from Japanese manufacturers identified by the TOPIX 33-sectors classification (index code 3050-3800) during April to June 2020. See Appendix A for the computation of variables.

Variables	N	Mean	S.D.	Min.	25%	Med.	75%	Max.
<i>APGR</i>	175	-0.098	0.321	-0.603	-0.303	-0.118	0.005	1.155
<i>SGR</i>	175	-0.071	0.206	-0.421	-0.177	-0.085	0.008	0.709
<i>SIZE</i>	175	9.444	0.975	6.970	8.814	9.352	9.936	12.493
<i>INVENTORY</i>	175	0.128	0.089	0.010	0.051	0.108	0.184	0.362
<i>CASH</i>	175	0.236	0.178	0.002	0.096	0.195	0.324	0.704
<i>ACCREC</i>	175	0.179	0.096	0.012	0.106	0.160	0.245	0.493
<i>LEVERAGE</i>	175	0.369	0.196	0.052	0.202	0.356	0.529	0.833
<i>TOBINQ</i>	175	1.228	1.061	0.462	0.703	0.916	1.330	7.684
<i>APTURN</i>	175	5.097	6.848	0.746	1.334	2.782	5.464	41.671
<i>HHI</i>	175	587.458	677.650	202.683	243.520	389.045	814.811	7504.072

Table 1 shows the summary statistics of the variables for the 175 manufacturers which report the unconsolidated quarterly financial information during the period from April to June 2020. The mean (median) of accounts payable growth rate based on the same quarter of the previous fiscal year is -0.098 (-0.118). Meanwhile, the mean (median) of the sales growth rate based on the same quarter of the previous fiscal year is -0.071 (-0.085). These represent that amid the COVID-19 pandemic, Japanese manufacturers experienced more than 7% drop in the sales compared to the same quarter of 2019. Furthermore, given that accounts payable is determined based on the business transactions,

the decline of sales is more likely to lead to a decrease in the use of accounts payable. Table 1 shows that on average, accounts payable is decreased nearly 10% compared to the same quarter of previous fiscal year.

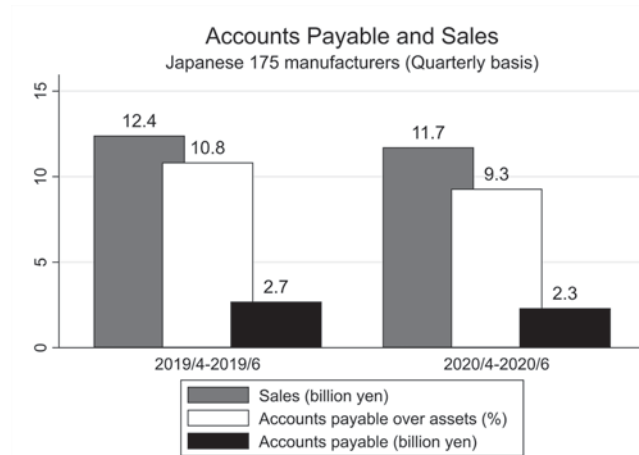


Fig. 1.

This figure presents the average sales (billion yen), accounts payable on total assets ratio (%), and accounts payable (billion yen) of the Japanese 175 manufacturers reporting the quarterly based financial statements. The right-hand side three bars depict the sample during the period from April to June 2020 and the other three bars on the left-hand side include the sample during the same quarterly period in previous fiscal year.

The Fig. 1 shows bars derived from the financial information of the sample. Compared to the period from April to June in the year of 2019, the 175 manufacturers gained on average 0.7 billion yen decline in its sales. On the other hand, the average amount of accounts payable was 2.7 billion yen and now decreased to 2.3 billion yen. This decline in firm's accounts payable is represented in accounts payable on total assets ratio. During the period from April to June 2019, 175 manufacturers had 10.8% of accounts payable to their total assets, and during the COVID-19 state of emergency, 9.3% is confirmed.

This paper relates accounts payable growth rate to firm's sales growth rate. Fig. 2 presents the scatter diagram and its fitted line between the sales growth rate and accounts payable growth rate. Those growth rates are based on the same quarter of previous fiscal year. Fig. 2 indicates that the degree of sales growth rate varies widely, and it is a noteworthy fact that 175 manufacturers experience tremendous reduction in the sales as well as in the accounts payable. Due to the COVID-19 pandemic in early 2020, Japanese government declared a state of emergency on April 7, and it was inevitable that the damage caused by shrinkage of demand would be inflicted on Japanese manufacturers.

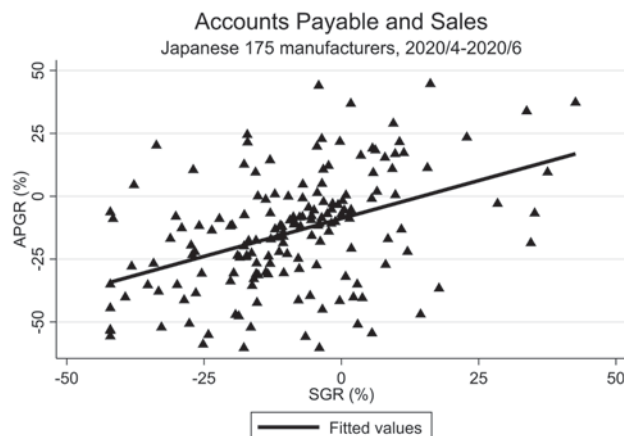


Fig. 2.

This figure shows the scatter plot and its fitted line derived from accounts payable growth rate (APGR) and the sales growth rate (SGR). Both variables are calculated as the growth rate based on the same quarter of previous fiscal year. Both axes cover between -50% and 50% of APGR and SGR.

Table 2 presents the pairwise correlation matrix for variables used in analyses. The correlation coefficient between the sales growth rate which is the key independent variable, and accounts payable growth rate shows statistically significant positive value. Meanwhile, with respect to correlations of control variables, potential multicollinearity issue likely exists in the variables such as CASH, ACCREC, LEVERAGE, and TOBINQ. Therefore, it might be necessary to omit and check the control variables used in the regression analyses.

Table 2

Correlation matrix

This table presents the pairwise correlation matrix for the variables included in the analyses. Pearson’s correlation coefficients and p-values (in parentheses) are included. See Appendix A for computation of variables.

	<i>APGR</i>	<i>SGR</i>	<i>SIZE</i>	<i>INVENTORY</i>	<i>CASH</i>	<i>ACCREC</i>	<i>LEVERAGE</i>
<i>SGR</i>	0.439*** (0.000)						
<i>SIZE</i>	-0.034 (0.655)	0.041 (0.595)					
<i>INVENTORY</i>	0.023 (0.760)	0.111 (0.144)	0.005 (0.945)				
<i>CASH</i>	-0.063 (0.409)	-0.145* (0.055)	-0.229*** (0.002)	-0.356*** (0.000)			
<i>ACCREC</i>	0.046 (0.544)	0.184** (0.015)	0.059 (0.440)	0.092 (0.226)	-0.390*** (0.000)		
<i>LEVERAGE</i>	0.077 (0.314)	0.133* (0.080)	-0.072 (0.346)	0.287*** (0.000)	-0.518*** (0.000)	0.311*** (0.000)	
<i>TOBINQ</i>	0.323*** (0.000)	0.103 (0.177)	-0.078 (0.306)	0.095 (0.213)	0.185** (0.014)	-0.172** (0.023)	-0.048 (0.527)

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

4. Empirical results

Model (1) of Table 3 presents the results of cross-sectional regression for the entire sample. The sales growth rate computed on the same quarter of previous fiscal year (SGR) has a positive and significant coefficient, suggesting that increase in the sales growth rate increases accounts payable. Holding the other explanatory variables constant, the sales growth generates accounts payable growth by 63.1% during the sample period between April and June 2020. These facts are consistent with the presumption that the sales growth rate is positively associated with the accounts payable growth rate. To mitigate potential multicollinearity concern, I conduct regressions with various combination of explanatory variables that are reported in Table 3. Model (2) shows the results including control variables such as total assets and the working capital, which contains inventory assets, cash and cash equivalents, and accounts receivable. However, such a statistically significant effect is not observed for those control variables. Equally, in model (3) of Table 3, I add the total assets and firm' leverage. In this model, the coefficient on the SGR consistently shows significantly positive effect of the sales growth rate on the accounts payable growth rate, whereas insignificant coefficients are observed for both control variables. Model (4) of Table 3 including TOBINQ as a proxy for firm's investment opportunity reveals that, consistent with the findings presented in model (1), the SGR is positively associated with APGR. Additionally, firm's investment opportunity also has a positive effect on the accounts payable growth rate.

Table 3

Regression results (Baseline)

This table reports estimation results of cross-sectional regressions of accounts payable growth rate on the sales growth rate. The dependent variable is the accounts payable growth rate (APGR), the growth rate is computed based on the same quarter of the previous fiscal year. See Appendix A for the computation of variables. t-statistics are reported in parentheses.

Dependent variable:	(1)	(2)	(3)	(4)
	<i>APGR</i>	<i>APGR</i>	<i>APGR</i>	<i>APGR</i>
<i>SGR</i>	0.631*** (5.98)	0.697*** (6.36)	0.683*** (6.34)	0.641*** (6.27)
<i>SIZE</i>	-0.016 (-0.69)	-0.019 (-0.83)	-0.017 (-0.74)	-0.010 (-0.44)
<i>INVENTORY</i>	-0.317 (-1.22)	-0.133 (-0.50)		
<i>CASH</i>	-0.181 (-1.13)	-0.076 (-0.51)		
<i>ACCREC</i>	-0.025 (-0.10)	-0.154 (-0.61)		
<i>LEVERAGE</i>	0.016 (0.12)		0.024 (0.21)	
<i>TOBINQ</i>	0.092*** (4.40)			0.084*** (4.22)
<i>Constant</i>	0.066 (0.26)	0.197 (0.79)	0.100 (0.45)	-0.065 (-0.31)
<i>N</i>	175	175	175	175
<i>Adj. R²</i>	0.252	0.175	0.182	0.259

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

This paper uses sales growth rate as a proxy for firm's bargaining power. In Table 3, the results show that firm's bargaining power is positively related to the accounts payable growth rate. This positive effect of bargaining power may not be evident homogeneously over companies. Accounts payable is sorted as a short-term debt.⁷⁾ It seems plausible that firm which can make early payment is likely to have more accounts payable, simply because they are considered less risky. I expect that the positive relation between the sales growth rate and accounts payable growth rate might depend on the degree of the accounts payable turnover (term of repayment). Specifically, I predict that firms with high accounts payable turnover have more sensitive in relation between the sales growth rate and accounts payable growth rate. Models (1) through (3) in Table 4 show the results regarding the degree of accounts payable turnover. The findings generally support the hypothesis, although relatively weak result is obtained from model (1) of Table 4. Indeed, compared to the model (2) of Table 4, model (1) shows a positive and smaller coefficient on the SGR at the 5% level of significance. Model (3) of Table 4 conducts regression analysis for the entire sample of 175 companies, by adding two-way interaction term of SGR and an indicator variable that demonstrates a value of one for firms in high accounts payable turnover (High turnover dummy). In this estimation, the two-way interaction term of SGR and high turnover dummy has a significant coefficient (at the 1% level of significance), suggesting that the positive association between the bargaining power and accounts payable growth rate is attributable to the degree of accounts payable early payment ability.

Meanwhile, trade credit is also used as a means for the supplier to exercise market influence and obtain information on their potential business partners in the product market. Given that supplier is likely to have an incentive to extend trade credit to their buyer in competitive market so that supplier can possibly expand market positions (Wilner, 2000), the relation between bargaining power and accounts payable growth rate relies on the market condition. To measure the degree of the market competitiveness, I use the HHI (Hirschman Herfindahl index). Model (5) in Table 4 conducts regression analysis for the sample identified as competitive market where firm's HHI is equal to or lower than the entire sample median (competitive market), and the rest of the sample is included in model (4) of Table 4. The reported coefficients on the SGR through models (4) and (5) are positive and statistically significant, consistent with the baseline results in Table 3. Model (6) in Table 4 presents results of regression including the two-way interaction term (SGR*Competitive dummy) for the 175 manufacturers. The results reveal that the positive association between the sales growth rate and accounts payable growth rate is pronounced in the competitive market (the coefficient on the interaction term is significant at the 1% level). In other words, the firm has a high accounts payable growth rate when the firm with a growing bargaining power is located in the competitive market.

Table 4

Regression results (Additional tests)

This table reports estimation results of cross-sectional regressions of accounts payable growth rate on the sales growth rate. The dependent variable is the accounts payable growth rate (APGR), the growth rate is computed based on the same quarter of the previous fiscal year. In Models (1) and (2), the entire sample is divided into low- and high-turnover group according to firm's accounts payable turnover (APTURNS). In Models (4) and (5), the entire sample is sorted into concentrated- and competitive-group according to firm's industry level HHI. Models (3) and (6) testing with the entire sample include the dummy variable and the interaction term of SGR and dummy variable, respectively. See Appendix A for the computation of variables. t-statistics are reported in parentheses.

Sample:	(1)	(2)	(3)	(4)	(5)	(6)
Dummy variable:	<i>Low turnover</i>	<i>High turnover</i>	<i>Entire</i>	<i>Concentrated</i>	<i>Competitive</i>	<i>Entire</i>
Dependent variable:	<i>APGR</i>	<i>APGR</i>	<i>APGR</i>	<i>APGR</i>	<i>APGR</i>	<i>APGR</i>
<i>SGR</i>	0.312** (2.03)	0.940*** (5.95)	0.275* (1.81)	0.324** (2.47)	0.904*** (5.35)	0.331** (2.23)
<i>SGR</i> × <i>Dummy variable</i>			0.653*** (3.11)			0.563*** (2.75)
<i>Dummy variable</i>			0.074 (1.63)			0.073 (1.63)
<i>SIZE</i>	-0.012 (-0.36)	-0.024 (-0.76)	-0.016 (-0.70)	-0.007 (-0.25)	-0.016 (-0.45)	-0.015 (-0.66)
<i>INVENTORY</i>	0.078 (0.20)	-0.429 (-1.19)	-0.192 (-0.74)	-0.261 (-0.82)	-0.214 (-0.50)	-0.237 (-0.92)
<i>CASH</i>	-0.006 (-0.03)	-0.482** (-2.02)	-0.258 (-1.63)	-0.325 (-1.51)	-0.062 (-0.25)	-0.181 (-1.15)
<i>ACCREC</i>	-0.174 (-0.51)	0.194 (0.53)	-0.033 (-0.14)	-0.046 (-0.15)	-0.146 (-0.38)	-0.073 (-0.30)
<i>LEVERAGE</i>	0.130 (0.73)	-0.273 (-1.37)	-0.048 (-0.36)	-0.150 (-0.91)	0.144 (0.70)	-0.001 (-0.01)
<i>TOBINQ</i>	0.064** (2.12)	0.107*** (3.62)	0.088*** (4.30)	0.089*** (2.94)	0.075** (2.36)	0.084*** (4.08)
<i>Constant</i>	-0.097 (-0.25)	0.296 (0.83)	0.047 (0.18)	0.038 (0.11)	0.053 (0.13)	0.029 (0.11)
<i>N</i>	88	87	175	84	91	175
<i>Adj. R²</i>	0.057	0.395	0.287	0.127	0.312	0.279

*** Significant at the 1% level.

** Significant at the 5% level.

* Significant at the 10% level.

5. Conclusion

As an alternative financing source, besides, with the nature of relationship-based short-term debt, the use of accounts payable is determined by the firm's bargaining power (Wilner, 2000; Giannetti et al., 2011; Klapper et al., 2012; Fabbri and Klapper, 2016). During the sample period from April to June 2020, I find that the sales growth rate is positively associated with accounts payable growth rate in Japanese manufacturing companies. Particularly, this positive relation between firm's bargaining power and the use of accounts payable is statistically significant when firm's accounts payable turnover (costs of goods sold over accounts payable) is high, and firms are in the competitive market. This paper's findings give important implication for the policy of firm's liquidity provision measure and contribute to the large and growing literature on the determinant of the accounts payable, which is affected by firm's bargaining power. Furthermore, this paper can shed light on the relevance of the early payment ability and the market competitiveness to the level of accounts pay-

able. Clearly, more work is needed to put these conjectures on firmer footing. For example, while this paper focuses on the trade credit built on the supplier-customer relationship, I need better data, such as the detail of supply chain to determine the direct relation between accounts payable and bargaining power. Moreover, the sales growth rate as the definition for firm's bargaining power is just one example, and I leave similar analyses along other dimensions as possibilities for future work.

Appendix A

Definition of variables

Variable	Definition
<i>APGR</i>	Accounts payable growth rate over the same quarter of the previous fiscal year
<i>SGR</i>	Sales growth rate over the same quarter of the previous fiscal year
<i>SIZE</i>	Natural logarithm of total assets
<i>INVENTORY</i>	Inventory scaled by total assets
<i>CASH</i>	Cash and cash equivalents scaled by total assets
<i>ACCREC</i>	Accounts receivable scaled by total assets
<i>LEVERAGE</i>	Total liabilities over total assets
<i>TOBINQ</i>	Sum of the market value of equity and the book value of debt divided by the book value of total assets
<i>APTURN</i>	Costs of goods sold over accounts payable
<i>HHI</i>	Hirschman Herfindahl index
<i>High turnover dummy</i>	One for firms that are sorted into the top half of accounts payable turnover (<i>APTURN</i>), and zero otherwise
<i>Competitive dummy</i>	One for firms that are classified into the bottom half of Hirschman Herfindahl index (<i>HHI</i>), and zero otherwise

[Acknowledgment]

This research is financially supported by the JSPS (Japan Society for the Promotion of Science) KAKENHI, Grant number 20K13528.

[Notes]

- ¹⁾ Ng et al. (1999) conduct the survey-based research (firms filed in COMPUSTAT database, Dun & Bradstreet, and Standard & Poor's) to investigate the practice of trade credit terms, and find that trade credit contracts are generally divided by simple net terms (net 30, full payment is due within 30 days) and two-part terms (2/10 net 30, a 2% discount for payment within 10 days, and the due to end in 30 days). This suggests the quick payment discount inherent in trade credit contract provides incentive to buyer to pay accounts payable early. By using The 1998 National Survey of Small Business Finances covering 3561 firms' database, Giannetti et al. (2011) also show that the average net terms due is 30 days, and 15.5% of firms supplying standardized goods, and 44.4% of firms supplying differentiated goods provide two-part terms to their buyer. Based on the 29,019 trade credit contracts (firms from North America and Europe), Klapper et al. (2012) discover that 13% of their sample offered the early payment discounts.
- ²⁾ See, for example, studies by Choi and Kim (2005), Love et al. (2007), Garcia-Appendini and Montoriol-Garriga (2013), Casey and O'Toole (2014), and Nam and Uchida (2019), who examine the relation between liquidity shocks in external capital market and the use of accounts payable.
- ³⁾ For example, the bargaining power is proxied by the number of buyer's suppliers, firm size, investment-grade, the portion of sales in supplier's profit, and product standardization (See, e.g., Giannetti et al., 2011; Klapper et al., 2012; Fabbri and Klapper, 2016).
- ⁴⁾ According to Petersen and Rajan (1997), buyer's profitability is related to the firm's credit quality, and

when firms with high quality of credit measured by the net profits over assets have significantly more accounts payable.

- 5) The relation between accounts payable growth rate and the sales growth rate is likely to be affected by unobservable variable which generates biased relation between the two variables. I expect that using the sample period of unpredictable exogeneous shock such as COVID-19 state of emergency mitigates this concern.
- 6) TOPIX sector indices between 3050 and 3800 including 16 manufacturing industries from TOPIX 33-sectors classification, such as, Foods (3050), Textiles and Apparels (3100), Pulp and Paper (3150), Chemicals (3200), Pharmaceutical (3250), Oil and Coal Products (3300), Rubber Products (3350), Glass and Ceramics Products (3400), Iron and Steel (3450), Nonferrous Metals (3500), Metal Products (3550), Machinery (3600), Electric Appliances (3650), Transportation Equipment (3700), Precision Instruments (3750), and Other Products (3800).
- 7) Based on the sample used in this paper, the average maturity of accounts payable is 72 days (computed as $365/(\text{costs of goods sold}/\text{accounts payable})$).

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