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# Bank loan availability and trade credit for small businesses during the financial crisis

Daisuke Tsuruta*

*College of Economics, Nihon University, 1-3-2 Misaki-cho, Chiyoda-ku, Tokyo 102-8360, Japan*

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ABSTRACT

Using small business data, we investigate the relationship between bank loan availability and trade credit in Japan during the recent global financial crisis. Previous studies argue that the relationship between trade payables and bank loan availability is negative because trade credit is an inferior financial resource for firms. In addition, firms with better credit availability offer more trade credit to their customers. Specifying the credit guarantee program for small businesses introduced in Japan after October 2008 as an exogenous shock that enhanced credit availability, we find that small businesses increase trade credit (both payables and receivables) if bank loan availability improves. This implies that the relationship between trade payables and bank loans for small businesses is complementary. Furthermore, small businesses with enhanced credit availability offer more trade credit to their customers.

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## 1. Introduction

In this paper, we investigate the effects of the availability of bank loans on trade credit for small businesses. Trade credit is one of several financial resources available to small businesses. This is because when firms purchase goods and services from their suppliers and sell goods and services to their customers, they generally delay payment to their suppliers, while their customers delay payment to the firm. Examination of firm balance sheets shows that trade payables appear with the former, and trade receivables arise with the latter.

Trade credit serves both financial and transaction motives. The transaction motive for trade credit is to avoid the transaction costs of paying cash (Ferris, 1981) and those associated with inventory holding (Bougheas, Mateut, & Mizen, 2009; Daripa & Nilsen, 2011; Emery, 1987). For example, Ferris (1981) argues that if buyers are to pay bills every time goods are delivered, they must have sufficient liquidity. To reduce these transaction costs, buyers and sellers use trade credit. This implies that firms with more frequent transactions tend to use larger amounts of trade credit. Elsewhere, Emery (1987) suggests that if there are strong seasonalities in demand for a firm's products, firms need to maintain larger inventories as a means of smoothing production cycles. To save this inventory cost, firms offer trade credit and sell the product to reduce the amount of inventories. This implies that the amount of trade credit is larger in firms that sell or purchase products with strong seasonal components. In addition, Daripa and Nilsen (2011) maintain that an upstream firm offers trade credit to a downstream firm to reduce inventory holding costs, which in turn help mitigate the lost sales of the upstream firm. Furthermore, Bougheas et al. (2009) conclude that firms facing uncertain demand for their products have an incentive to extend trade credit in order to promote sales, and thereby mitigate the cost of maintaining inventories of finished goods.

For the most part, the literature on financial motives focuses on the relationship between bank loans and trade credit, with many studies arguing that firms receive trade credit if they face difficulty in obtaining bank loans (Danielson & Scott, 2004; Demiroglu, James, & Kizilaslan, 2012; Petersen & Rajan, 1994, 1997). For example, Petersen and Rajan (1994, 1997) show that small businesses with short-lived banking relationships receive more trade credit,

* Tel.: +81 3 3219 3606; fax: +81 3 3219 3606.
*E-mail address:* tsuruta.daisuke@nihon-u.ac.jp

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as banks do not typically offer them sufficient credit because of the presence of information asymmetry.[1] Other studies focus on the relationship between bank credit and the behavior of trade creditors during financial shocks. For example, Nilsen (2002), Atanasova and Wilson (2004), Choi and Kim (2005), and Mateut, Bougheas, and Mizen (2006) find that small firms increase their trade credit when it is received as a substitute form of credit during monetary contractions.[2]

In examining the recent subprime shock, several studies (Carbó-Valverde, Rodríguez-Fernández, & Udell, 2012; Yang, 2011a) support the substitute hypothesis concerning the relationship between trade credit received and bank loans.[3] These studies assert that because the cost of trade credit can be very high, sometimes involving annual interest rates in excess of 40%, firms use trade credit to compensate for the reduced availability of bank loans (Petersen & Rajan, 1994; Smith, 1987). Focusing on the offering of trade credit, Garcia-Appendini and Montoriol-Garriga (2013) argue that suppliers with access to readily available inexpensive bank loans or those with sufficient liquidity can offer more trade credit at higher interest rates to their customers.

We argue that while many existing studies have empirically investigated the relationship between bank loans and trade credit, these have significant shortcomings because the empirical relationships between bank loan availability and trade credit involve problems with endogeneity and spurious correlations. This assumption concerning the exogeneity of bank loan availability is based on the pecking order theory described by Petersen and Rajan (1994), which argues that firms first use relatively inexpensive bank loans and then expensive trade credit after bank loans become unavailable. Because of the high cost of trade credit, previous studies have also argued that firms receive trade credit as a last resort during a liquidity shock or during periods of financial distress (Cunat, 2007; Wilner, 2000).

However, some studies (Marotta, 2005; Miwa & Ramseyer, 2008; Uesugi et al., 2009) show that the cost of trade credit is not necessarily higher than that of bank loans. The results of these studies thus suggest that the assumption of the exogeneity of bank loan availability may be invalid. In addition, as some studies (for example, Aktas, de Bodt, Lobez, & Statnik, 2012; Biais & Gollier, 1997; Jain, 2001) assert, suppliers may have an information advantage over banks, such that the lending attitude of banks can be determined by the availability of trade credit. Empirically, Atanasova (2012) finds that trade credit has positive effects for bank loans for firms with high agency costs, which supports the signaling role of trade credit provision.[4]

To overcome the endogeneity problem, some studies (for example, Garcia-Appendini & Montoriol-Garriga, 2013; Love et al., 2007) treat declines in the availability of bank loans during a financial shock period as an exogenous shock. In this paper, we use an alternative identification strategy; namely, the exogenous change in the availability of bank loans resulting from the emergency credit guarantee (ECG) program established in Japan on October 31, 2008.[5] Under the public credit guarantee program, local government-affiliated credit guarantee corporations offered credit guarantee services to credit-constrained small businesses in exchange for an annual credit guarantee fee of about 0.45% to 1.90%. The credit guarantee corporations then ensured the repayment of any defaulting guaranteed loans. Japanese banks were then in the position of being able to offer risk-free loans to small businesses in the presence of a guarantee from a credit guarantee corporation. Consequently, banks did not ration credit to notionally informationally opaque small businesses.

At the end of October 2008, the public credit guarantee corporations commenced the ECG program, which would eventually provide new guarantees of 9.181 trillion yen in total by March 2009. Small businesses that satisfied the requirements for the ECG program could obtain new guaranteed loans. Therefore, for small businesses that satisfied the ECG program requirements, credit availability improved after October 2008. This policy change in the public credit guarantee system is then an exogenous change that enhanced bank loan availability for small businesses. Identifying this policy change as an exogenous shock, we thus check whether the availability of bank loans exerted negative effects on trade payables and positive effects on trade receivables using the difference-in-differences (DID) approach. As small businesses were more vulnerable to the evolving financial crisis and faced severe credit constraints, we use firm-level data on small businesses instead of that for listed firms.

If (relatively expensive) trade payables are substitutes for bank loans, small businesses satisfying the ECG program requirements would have decreased their trade payables because they could obtain new guaranteed inexpensive bank loans instead. However, we find that these small businesses did not decrease their trade payables at this time. Instead, they increased the amount of trade payables following the establishment of the ECG program, which suggests that trade credit and bank loans are complementary rather than substitutes. This result implies that trade credit is not inferior to bank loans and that trade credit then does not serve as a substitute when there is less availability of bank loans. We also estimate the relationship between trade payables and bank loans using a dummy variable (which has a value of one if the firm satisfies the requirements of the ECG program) as an instrumental variable. We find that the bank loans to total assets ratio has positive effects on the trade payables to total assets ratio. These results are similar if we alternatively specify the growth rate of trade payables and bank loans. These additional results also support our finding that trade payables and banks loans are complementary.

Although many studies assert that trade credit received is a substitute for bank loans, these sources of credit can be complementary. As previous studies (for example, Wilner, 2000) argue, suppliers are unsecured lenders, whereas banks are secured

[1] In addition, Demiroglu et al. (2012) show that firms without lines of credit receive more trade credit when bank lending standards are tight. Danielson and Scott (2004) find that small businesses that have applications for bank loans rejected receive trade credit. Some studies also argue that firms in countries with poorly developed financial institutions receive more trade credit because they cannot borrow sufficiently from financial institutions when they require external finance (Fisman & Love, 2003; Ge & Qiu, 2007).

[2] In addition, Love, Preve, and Sarria-Allende (2007) find that firms with high levels of short-term debt, which are vulnerable to financial crises, reduce the provision of trade credit during periods of contraction in bank credit. In contrast, however, using Italian data, Marotta (1997) shows that small firms did not receive trade credit sufficient to compensate for the decline in bank loans during a monetary squeeze. As a result, as Yang (2011b) has argued, the relationships between trade credit and bank loans can be either complementary or substitutionary.

[3] Yang (2011a) shows that accounts payable and bank credit for small firms are negatively associated, whereas accounts receivable and bank credit are positively related. Using Spanish data, Carbó-Valverde et al. (2012) show that credit-constrained small businesses increased trade credit received as a substitute for bank loans during the financial crisis after 2007.

[4] Some studies investigating bank loans and trade credit (for example, Danielson & Scott, 2004; Petersen & Rajan, 1997; Yang, 2011a) use proxies for the availability of bank loans (for example, the amount of bank loans, the duration of banking relationships, and dummy variables indicating the denial of credit at the last loan request) as independent variables and trade credit as the dependent variable. However, causality can operate in the opposite direction. That is, the proxies for trade credit can also be independent variables, while the proxies for bank loan availability may also be dependent variables.

[5] The ECG program concluded at the end of March 2011. See Small and Medium Enterprise Agency (2009) for details of the ECG program.

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