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How Trade Credit Differs from Loans: Evidence from Japanese Trading Companies*

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Abstract

In this paper we examine the determinants of the relationship between trade credit and bank loans. Previous studies of this relationship fall into two categories: (1) those emphasizing the difference between financial and non-financial institutions, and (2) those emphasizing the difference between credit instruments. By using data on trading companies that supply both loans and trade credit we are able to determine the relative importance of both institutional differences and instrumental differences for the trade credit-loan relationship. We find that trade credit and loans differ significantly even when offered by the same institutions, while loans extended by financial institutions and those extended by non-financial enterprises respond similarly.

JEL codes: G21, G29, G32
Key words: trade credit, bank loans, trading company

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1. Introduction

Trade credit is a vital component of corporate finance in many countries. Japan is no exception with its corporate sector having about 15% of its total assets in trade payables. Compared to the vast literature on banking, however, trade credit has received rather modest attention from researchers. There have been several studies focusing on the relationship between trade credit and loans in Japan. Ogawa (2003) posits that trade credit was a substitute for bank loans during Japan's recent financial crisis. In contrast, Ono (2001) finds evidence for a complementary relationship between bank loans and trade credit. Recently, the Japanese financial authorities have issued a series of policy packages to stimulate trade credit transactions since trade credit can be used as collateral to facilitate the flow of credit to firms. For example, since July 2003 the Bank of Japan has begun outright purchases of securitized trade credit as a part of its market operations. To accurately evaluate the effects of such policies, a better understanding of the relationship between trade credit and loans is needed. In this paper, we clarify the trade credit-loan relationship by examining the behavior of Japanese trading companies that extend both trade credit and loans.

Researchers have put forth a variety of hypotheses on how trade credit is determined, and how trade credit is related to other financial instruments. We can separate these hypotheses into two categories. In the first category are those hypotheses that focus on the differences between financial institutions, which supply loans, and non-financial institutions, which provide trade credit. These institutional differences are important as the ability to acquire borrowers' credit risk information, to efficiently liquidate collateral and to forcefully negotiate for smooth repayment differs substantially across financial and

non-financial firms. In the second category are those hypotheses concerned with instrumental differences. Differences in transaction costs, interest rates and moral hazard all play a vital role in determining the relationship between trade credit and loans.

Previous empirical studies have looked at both sets of hypotheses. For example, Petersen and Rajan (1997) implement comprehensive tests based on detailed small business finance. The results of these studies, however, cannot identify which of these two categories of hypotheses are actually being tested. When these researchers observe that trade credit and bank loans behave differently, they have not been able to determine whether it is because non-financial enterprises have more reliable credit information than banks, or whether trade credit is fundamentally different than loans.

In this paper, we are able to determine the relative importance of both institutional differences and instrumental differences for the observed behavior of trade credit in the Japanese economy. Our dataset, which contains aggregate balance sheet data, by size and industry, and also firm-level, small and medium business finance data, enables us to implement our study. We investigate whether financial and non-financial institutions have different lending behavior by focusing on a single financial instrument, such as loans. We also test if different credit instruments respond differently to exogenous shocks by analyzing the lending activity of institutions that deal with a variety of financial instruments, including trade credit and loans.

In this regard, Japan's giant trading companies, or *Sogo Shosha*, can be used as powerful instruments. Their size is immense, with several of these firms recording annual sales in excess of ¥10 trillion. They extend and receive trade credit so frequently that they at one time accounted for more than 10% of trade credit outstanding in Japan. In addition,

they provide a variety of financial commitments to their customers in the form of loans and other investments. In fact, loans and loan guarantees provided by these firms amount to ¥4.5 trillion.

A major contribution of this paper is the finding that institutional differences, between financial and non-financial firms, do not affect the relationship between trade credit and loans by as much as the previous literature has insisted. We do not find much empirical support for theories that emphasize institutional differences[1] in determining the trade credit-loans relationship. We do find, however, that differences in the characteristics of instruments do significantly impact the relationship, and that hypotheses based on instrumental difference are consistent with the empirical results.[2] These findings are critical to precisely evaluating the financial intermediation activities of both financial and non-financial institutions.

The paper is organized as follows. Since we employ the Japan's giant trading companies as instruments, sections 2-4 of the paper describe their financial activities in detail. Section 2 defines the scope of analysis for trading company finance. Section 3 reviews the previous literature on trading companies, and their financial functions. Section 4 summarizes overall trading company finance, as well as discussing its individual components. In this section we also compare trading company behavior with the financial activities of other industries. In section 5 we exploit the fact that trading companies use both trade credit and loans, and analyze the factors affecting the trade credit-loans

[1] Specifically, the informational advantage theory and the price discrimination theory may not be the primary factors affecting the relationship between trade credit and loans.

[2] A recent study by Burkart, Ellingsen, and Giannetti (2004) draw similar empirical conclusions in that they emphasize the high diversion cost of trade credit, and find little support for the informational advantage hypothesis.

relationship. We control for different financial instruments in section 6, in order to investigate the response of loans to trade credit shocks. Section 7 concludes.

2. Defining Trading Company Finance

We begin by defining exactly what a "trading company" is. Large wholesale firms in Japan tend to be net lenders of trade credit, holding more trade receivables than trade payables. These firms regard trade credit as an indispensable tool with which to extend their transaction channels, and not merely as a byproduct of their daily commercial transactions.[3] All of these firms contain credit examination sections staffed with credit analysts. Furthermore, those that deal with a variety of commodities make larger commitments, in the various phases of distribution, than those that deal with a specialized line of commodities. These large-sized wholesale firms, often called general trading companies, successfully utilize these commitments to efficiently allocate funds to borrowers. Given these points, we limit our focus to these general trading companies.

There are nine general trading companies in Japan (Mitsubishi, Mitsui, Sumitomo, Itochu, Nissho Iwai, Marubeni, Nichimen, Tomen, and Kanematsu), all of which we analyze in this paper.[4] It should be noted, however, that there are large differences between these companies. Moreover, recently some of the smaller, specialized trading companies have begun to enter into new business areas and have grown to the point that they have "caught up" with some of the smaller general trading companies. Among the nine general trading companies, the smallest four (Nissho Iwai, Nichimen, Tomen, and Kanematsu) not only lag far behind the larger five (Mitsubishi, Mitsui, Sumitomo, Itochu, and Marubeni) in terms of sales and other measures of performance, but also in terms of the restructuring of

[3] See Ariga and Emery (1996).
[4] In 1977 Itochu acquired Ataka Sangyo, which was the tenth largest trading company at the time.

their organizations, such as mergers, sales of major businesses and a series of employment adjustments.[5] On the other hand, Toyota Tsusho Corporation, which has long been categorized as a specialized trading company, selling automobiles affiliated with Toyota Motors, has acquired many new businesses and, as of its 2002 financial statement, has larger sales than any of the four smallest general trading companies.

We now define "trading company finance." Trade credit transactions with client companies are the most important component of trading company finance. Wholesale businesses, which include general trading companies, use trade credit more heavily than other industries due to their high turnover rate. Financial Statements Statistics of Corporations, for fiscal year 2002, show that the ratio of trade payables to total assets is 32.1% for the wholesale industry, well above the industry average of 13.7%. There are two ways to measure the size of total trade credit extended by trading companies: total trade receivables (notes receivable + accounts receivable) or net trade credit (trade receivables – trade payables). Since trade receivables and trade payables do not necessarily comove, in that a firm cannot stop paying for its trade payables even if their trade receivables are in default.[6] Therefore, it is better to consider trade receivables and trade payables separately for analysis. Although, it should be noted that the amount of trade receivables net of trade payables is useful when determining if a firm is a net creditor.

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[5] Nichimen and Nissho Iwai merged in April 2004 and adopted a new company name, Sojitsu. Tomen sold a part of their steel business to Toyota Tsusho with whom they plan to merge in the future. Kanematsu is now categorized as a specialized trading company since it has taken several drastic restructuring measures, including a reduction of personnel by 60% since 1999.

[6] Simultaneous cancellation of trade receivables and trade payables is only possible with an agreement between the two parties, and when the parties have trade credit with one another. But only about 20% of all the client firms to which general trading companies have extended trade receivables are also those to which they owe trade payables (from the Survey of Financial Environment by Small and Medium Enterprises Agency). In contrast, small companies are unlikely to have both trade payables and receivables with a general trading company, with the exception of a limited number of businesses, such as processing firms.

In addition to trade credit, general trading companies provide other sources of financing to their customers. From detailed information on (client) firms that have long-term relationships with the general trading companies through commercial transactions, or capital investments, we find that the trading companies are sometimes better at handling credit risk than banks.[7] Trading companies extend both long-term and short-term loans, invest in equities and offer loan guarantees to client firms, all of which are vital in maintaining lasting business relationships.[8] It should be noted, however, that some of the credit is extended for forbearance. Since sales and trade credit generally do not coincide, firms sometimes use loans, or loan guarantees to finance deficits rather than in extending business transaction channels.[9]

In addition to expanding traditional commodity transactions, general trading companies also engage in financial activities to earn profits. Examples of such profit-making activities include leasing, security investment based on specified money in trust, foreign exchange transactions, forward contract transactions and project financing. More recently the general trading companies have also entered into credit liquidation by asset-backed securities, provision of clearing functions of trade credit, financing social infrastructure by private finance initiative and establishing venture capital.[10] Because some of these activities are off-balance sheet, and such a small part of these firms overall

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[7] The issue of the handling credit risk is discussed in more detail in section 5.1.

[8] Large wholesale businesses have higher ratios of other liquid assets (including short-term loans) to total assets and long-term loans to total assets, 10.7% and 4.4%, respectively, than smaller wholesale business, 8.0% and 0.7%, respectively (October-December, 2003--from the Financial Statements Statistics of Corporations).

[9] For example, see the Study group on trading company finance (1977, p 148). For a counterexample, see the Fair Trade Commission (1974, p 8).

[10] For the recent developments in the financial activities of trade companies, see Itochu (1997, pp 142-44) and Kubo (2001, pp 40-47). However, is should be noted that it took some time for all general trading companies to realize the importance of these new activities.

activities, it is difficult to analyze these new activities in detail. Therefore, for the purposes of this paper we define trading company finance as the following items on a company's balance sheet: trade receivables, net trade receivables, short- and long-term loans, equities of related companies, investment and loan guarantees.

3. Japanese Trading Company Finance

General trading companies in Japan are regarded as quite distinct from other wholesale firms. As mentioned earlier their scale is colossal, often totaling more than ¥10 trillion a year in sales. These firms also deal with between 20,000 to 30,000 goods, including production, intermediate and consumption goods. Secondly, their commercial dealings include both domestic and foreign transactions and are often efficiently integrated. For example, the textile transactions of a general trading company include the entire distribution process, from cotton and wool purchases and imports to fiber, textile and clothes sales and exports. These commercial transactions are supported by a variety of activities such as investment, financial and management assistance and information provision. Similar types of businesses are rarely seen in the rest of the world, save for Korea and China. Because of this, these types of trading companies are specifically called *Sogo Shosha* even outside of Japan.

Although general trading company finance is our focus, academic research in this area has been scarce. For this reason, we begin this section by reviewing the activities of general trading companies. As discussed in section 2, defining what a trading company is, and what trading companies do, is critical for any study. Researchers have defined Japan's general trading companies in several ways. Shimada, Ko and Tanaka (2003) categorize trading companies according to the commodities traded, be it textiles, machinery or foods.

They define the objective of trading companies to be an expansion of sales opportunities, and investigate how each individual business area has been successful in this regard.

Itochu (1997) classifies companies according to their functions, such as commodity transactions, investment, management, information processing and finance. He suggests that commodity transactions, investment and management as being the core functions of trading companies, and finds that the latter two functions have increased in importance in recent years. Finally, Yoshino and Lifson (1986) examine the impact of organizational structure, for instance human resource allocation and inter-firm relationships, on the outstanding success of these firms in business transactions.

Another area of research investigates why trading companies undertake a myriad of functions. Rauch (1996) posits a theoretical model of discriminated goods, where firms themselves have to find customers without relying on the pricing function of markets. He shows that, in this case, the economy of scope pays off by reducing the search cost for customers. This is exactly one of the primary characteristics of the Japanese general trading companies. In contrast, specialized trading firms survive merely through providing a "middleman" service using industry specific knowledge, and do not depend on economies of scope in search to be effective.

As one of the major functions of these companies, financial activities have been regarded as indispensable, through supporting commodity transactions, to borrower firms. Though dating back more than 20 years, the Study group on trading company finance (1977), not only contains the volume of trade receivable and loans for each general trading company, but also has qualitative evidence on how these firms finance customer companies to maintain their sales channels. The Fair Trade Commission (1974, 1975) examined if

trading companies violated the Anti-monopoly Act by implementing their businesses, particularly their financial activities. The report discusses several cases in which trading companies are suspected of not abiding by the law. In one case, a trading company extended loans to a client firm on the condition that the borrowing firm pays, to the lending firm, commission fees for every commodity purchased, even for those purchases without any connection to the trading company. The key issue, for our purposes, is not the possible violation of the law, but rather how closely the financial function of the firm is tied to their objective of having larger business transactions channels, and eventually larger profits.

Since the 1980's trading companies have sought to earn profits directly from their financial activities.[11] Ubukata (1989) interviews a large number of company managers and executives, and provides an intriguing reference on how trading companies invested money, procured at significantly low costs due to their excellent credit ratings, in the late 1980's. When the bubble burst, however, these general trading companies suffered large capital losses, in securities markets. Kubo (2001) details the recent financial activities of trading companies, including venture capital investment and trade credit transactions settlement.

While there have been a reasonable number of descriptive papers about trading company finance, not many researchers have taken an economic perspective in their analysis of the financial activities of these companies. Ariga and Emery (1996) and Sheard (1989) are notable exceptions. Ariga and Emery (1996) conduct a survey study on the use, by general and specialized trading companies, of notes payable and receivable. They gather information on the ratio of payment on credit to all business transactions, factors affecting payment period and the discount rate of notes. One of their interesting findings is that

[11] See Itochu (1997) for a listing of activities. These activities are also discussed in more detail in section 2.

general trading companies are more flexible than specialized firms are at changing trade credit terms in accordance with their customers' financial status. Sheard (1989) suggests that the reason these companies hold trade credit is to bear the default risk of clients, and that seemingly meaningless trade credit transactions are motivated by economic incentives. He also shows general trading company finance to be the sum of trade credit and loans extended. Therefore, focusing on trade credit extended by general trading companies, and contrasting this with loans extended is a meaningful exercise since both of these instruments are regarded as financial tools.

With the exception of these papers, not much more research has been done in the area. In particular, it is difficult to find work on, not only the use of trade credit by trading companies, but also on the use of loans, loan guarantees and investment in equities of related companies by trading companies. In addition, while other firms also engage in financial activities, their activities have not been fully compared with the activities of trading companies. Therefore, we undertake a quantitative investigation of trading company finance. We begin by summarizing overall trading company finance and its components. We then compare the financial activities of trading companies with the financial activities of other industries.

4. Time-Series Analysis of Trading Company Assets

In this section we analyze the behavior of general trading companies in credit markets. The analysis is based on time-series data from two sources: the financial statements of individual general trading companies, and the aggregated Financial Statements Statistics of Corporations. We first summarize each of the trading companies' financial instruments (trade receivables, loans, loan guarantees, the equity of related firms

and investment) in order to note similarities and differences in firm use of these instruments. We next utilize the fact that other non-financial businesses provide financing to firms in order to contrast trading company finance with finance by other institutions, such as the manufacturing and construction businesses.

4.1. Trading Company Finance by Instrument

Financial statement data for the nine major general trading companies comes from the Development Bank of Japan's Industrial Financial Databank. We aggregate each balance sheet item for fiscal years (FY) 1960, 1970, 1980, 1990 and 2002. Table 4-1 displays amounts outstanding, for the general trading companies, of trade credit, short- and long-term loans, equities of related firms, investment and loan guarantees for these years. Table 4-2 displays trade payables and loans, from financial institutions, received by all corporations (excluding financial and insurance businesses) in Japan.

From the tables it is clear that trade receivables are the primary form of credit extended by trading companies. Trading companies provide a sizable share of the trade credit extended to corporations in Japan, as high as 12% in FY 1973, and, even after a significant reduction in the size of trading companies due to falling sales in the 1990's, 3% in FY 2002. Net trade receivables, the difference between trade receivables and trade payables, has been positive over time, indicating that general trading companies are a key source of trade credit for the rest of the economy.

The major trading companies also hold a significant amount of short- and long-term loans, more than ¥1.5 trillion in FY 1990, which is comparable to a medium-sized regional bank, though not comparable to loans extended by all financial institutions in Japan. Equities of related firms, investments, and loan guarantees are also quite sizable. Equities

and investments, in particular, have doubled in the 1990's, while trade receivables and loans have declined.

Figure 4-1 plots each balance sheet item against total assets for the general trading companies.[12] We can see that trade receivables relative to total assets has declined since FY 1984. As of FY 2002 trade receivables account for 25.5% of total assets, which is less than half its share in FY 1960. Accounts receivable, a major part of trade receivables, has also fallen against total assets, by about two-thirds since FY 1960. The decline in trade receivables can be attributed to the decreased use of notes payable. Notes payable are subject to stamp taxes and back-office processing fees, which these firms try to avoid.[13] Another reason for the decline is that, in the late 1980's total assets of general trading companies exploded. These firms exploited their excellent credit ratings and issued considerable amounts of commercial paper and corporate bonds. Over the entire sample, we also see that net trade credit has been positive, and even moderately increased in the 1980's. However, trading companies such as Marubeni and Itochu have significantly reduced their net trade credit positions in the adverse financial environment of 1990's.

Long- and short-term loans have fallen relative to total assets in recent years, but have remained in the range of 3% to 6%. In contrast, holdings of shares of related firms, and the investment ratio have risen dramatically from about 1%, at the beginning of the sample, to near 20% at the end. The loan guarantee ratio also increases in the latter half of the sample. There are two possible explanations for the observed increases in stock investment and loan guarantees over the sample. The first explanation centers on an effort

[12] We look at the balance sheet items relative to total assets to adjust for the size of the economy. Petersen and Rajan (1997) also employ the value of total assets to normalize each balance-sheet item.
[13] For promissory notes of more than ¥100,000, issuers pay, at most, 0.2% of the value for stamp taxes.

by general trading companies to stimulate commodity transactions, which is a traditional intermediary role of trading companies. For example, investing in related firms develops strong managerial ties, facilitating commodity transactions between the general trading companies and related firms. Loan guarantees to finance the daily operational activities of client companies also help general trading companies to increase their commodity transactions. Moreover, loan guarantees are preferred to traditional loans since the guarantees do not expose the general trading companies to foreign exchange rate risk, or other depreciation risk. The second motivation for increasing the share of these two assets is to earn profits directly from financial transactions without having to engage in business transactions or sales. Examples include private equity investment and loan guarantees for project financing, both of which are not necessarily accompanied by commodity transactions. Rather, trading companies obtain capital gains or commission fees from them.

4.2. Financial Instruments and Business Conditions

From figure 4-1 it is evident that the trade receivables ratio declines during recessionary periods, while the other credit measure ratios increase. It is not enough, however, to look at how these financial instruments move with the business cycle on an annual basis since business condition statistics are usually reported at a monthly, or quarterly frequency. To be more careful in accounting for business trends, we employ quarterly data from the Quarterly Financial Statements Statistics of Corporations of large-sized wholesale businesses, available from the Ministry of Finance, and the Tankan Survey Diffusion Index (DI) of business conditions,[14] available from the Bank of Japan.[15]

[14] The survey covers wholesale businesses.

[15] The Business Condition Diffusion Index (DI) of BOJ's Tankan survey begins in June 1965. Until March 1974 we employ the DIs for the major firms. After this time we use the DIs for all-Japan firms, which better represents the overall economy.

The Tankan Survey DI of business conditions measures the percentage difference between firms that regard current business conditions as "good" and those that regard current conditions as "bad". The DI is frequently used as a proxy for Japanese business conditions.[16] Large-sized wholesale companies are those with at least ¥1 billion in capital, which include the nine general trading companies.[17] Based on these two data sets, we calculate the correlations between business conditions and the financial instruments of wholesale businesses. It should be noted that some financial instruments, such as short-term loans and investments, are aggregated with other miscellaneous items, and that loan guarantees are not available on the Quarterly Financial Statements Statistics of Corporations.[18] The correlations are presented in table 4-3.[19]

The table shows that trade receivables moves quite differently from the other credit instruments over the business cycle. The trade receivables ratio is significantly, positively correlated with the Tankan DI, while the other liquid assets ratio, long-term loans ratio and the stocks of related firms ratio are all significantly negatively correlated with the Tankan DI. Thus, as business conditions decline, the trade receivables share of total assets increases, while in better economic environments its share declines.

Looking at lagged correlation coefficients, we observe another significant

[16] See for example, Kamada and Masuda (2001).

[17] There are 594 wholesale firms with at least ¥1 billion of capital in the third quarter of 2003, including the nine general trading companies. Combined total assets of these firms amount to ¥73.8 trillion, with ¥41.4 trillion being accounted for by the nine general trading companies in FY 1990. In FY 2002 these figures are ¥55.6 trillion and ¥21.0 trillion, respectively. These numbers make clear that these statistics are primarily attributable to large-sized wholesale businesses.

[18] In addition to short-term loans, other liquid assets include advances, prepaid expenses, mortgage securities, accrued revenue and accrued income. Investments and other fixed assets (excluding stocks, bonds and long-term loans) include investments, deposits for renting real estate, long-term prepaid expenses and golf-club memberships.

[19] Regression analysis would be ideal, but given five observations per balance sheet item, it is just not feasible.

difference between the credit instruments. The significance and sign of trade receivables does not depend on the lag length. In contrast, at lags longer than four quarters, other liquid assets displays insignificantly negative correlations, while at lags longer than seven the correlations are significantly positive. Finally, the correlation of long-term loans with the DI is always insignificant and negative.

4.3. Trends in Trading Company Finance

In the preceding subsection, we showed, using the individual asset-side items of general trading companies, that the ratio of trade credit provided by these firms is positively correlated with a measure of macroeconomic business conditions, while loans extended by these firms is negatively correlated. In this subsection, we aggregate assets in order to observe the relationship between total trading company finance and business conditions.

Trade receivables are by far the largest component of trading company finance, particularly prior to the 1980's. Therefore, its positive correlation with business conditions long dominated the overall positive correlation of trading company finance with business cycles. For the nine general trading companies, trade receivables is still the largest of the credit market instruments, although its dominance has declined since FY 1990. Its share in total assets has fallen to less than half of its FY 1960 value. In contrast, the use of stock investments and loan guarantees, as discussed in subsection 4.1, has been increasing.

Due to inconsistencies in measurement between market values and book values we cannot immediately see the increase in stock acquisitions of related firms as a sign of stronger managerial commitment toward these related companies. However, there are many cases of trading companies choosing prospective clients in which to invest with the

objective of establishing stronger firm relationships. The trading companies not only offer trade credit to these firms, but also dispatch executives to them. For example, Mitsubishi Corporation recently acquired stock in one of the largest convenience store chains in Japan, and dispatched a CEO to run the company. In addition, the company has invested in several major food wholesalers, in an effort to make its food distribution channel more efficient. As seen in table 4-3, however, this type of action is counter-cyclically related to the business conditions, and so contrasts with trade credit movements.

Another component of trading company finance that has been gaining in importance is loan guarantees. Trading companies use this credit instrument to support their customers in borrowing from financial institutions. Trading companies sometimes use loan guarantees as a substitute for loans, allowing them to avoid having credit, or foreign exchange risks added to their balance sheets. Since loan guarantees and loans are substitutes, we expect the loan guarantee ratio to be negatively correlated with business conditions.[20]

Table 4-4 displays the correlation between overall trading company finance and business conditions. Here trading company finance is comprised of trade receivables, other liquid assets, long-term loans, stocks of related firms and investments and other fixed assets.[21] Correlations between each instrument, relative to total assets, and the DI of Bank of Japan's (BOJ) Tankan, from the second quarter of 1975, are displayed. One thing to note is the possibility of a structural change in the use of trade credit. As mentioned in subsection 4.1, there was a significant drop in the use of trade credit in the late 1980's,

[20] It should be noted, however, that in case of loan defaults, the correlation between loan guarantees and business conditions could be positive. Loan defaults, which are expected to occur more often in economic downturns, decrease loan guarantees outstanding, thus, resulting in a positive relationship between business conditions and loan guarantees to total assets.

[21] As stated earlier the Quarterly Financial Statements Statistics, unfortunately, have no data on loan guarantees.

especially notes payable and receivable as trading companies attempted to evade stamp taxes, as well as the administration costs for the notes. Figures 4-1 and 4-2 show that the trade receivables to total assets ratio has dropped by more than 10% for the major trading companies between 1985 and 1990.[22] We, therefore, divide our sample into three sub-samples: 1975:2-1984:4, 1985:1-1989:4 and 1990:1-2003:3. From the table we see that the correlation becomes significantly negative later in the sample period.

What is the implication of this larger, significant negative correlation between trading company finance and business conditions? A smaller share of trade receivables and a larger share of stock investments imply that trading companies have made a stronger commitment to extending lasting financial assistance to prospective client firms. In addition, despite the fact that the ratio of short- and long-term loans to total assets has decreased, the loan guarantee ratio has risen. This implies that trading companies have made a commitment to provide credit through loans whether or not they are actually extended by the companies themselves.

4.4. Comparison with Other Industries

In this section, we compare financing by trading companies to financing by other industries. We compare the major trading companies with large-sized manufacturing and construction companies, because these firms, similar to the trading companies, also supply loans and extend trade credit. We look at the size of trade receivables, loans and other credit instruments, the ratios of these instruments to total assets and finally their relationship with business conditions. We examine manufacturing, not only as a contrast

[22] The null hypothesis of no significant difference in correlation for the three periods (85/1-3, 85/4-6-89/10-12 and 90/1-3) is easily rejected. Maximum F-statistics to reject the null is reached when we divide the samples in 87/4-6 and also in 88/10-12. Table 4-4 also calculates the correlation coefficients for these sample periods, and we obtain similar results.

with non-manufacturing industries, but also to see if manufacturing firms are more, or less flexible than wholesale firms in the conditions of trade credit. Finally, we focus on the construction sector because the larger firms in this industry use trade credit more frequently than other non-manufacturing industries.

Table 4-5 shows that all of these industries have provided a significant amount of financing to the Japanese economy in the form of trade receivables, long- and short-term loans, stocks of related firms and investments. In the manufacturing and construction businesses, the ratios of trade receivables and long- and short-term loans to total assets are smaller than what we find for trading companies, while those of stocks and investments are larger. Table 4-6 displays the correlation between business conditions for each industry and the ratios of individual financial instruments to total assets. Correlations of trade receivables and those of other financial measures are opposite in sign, both in the manufacturing, and the construction sectors. Correlations between the trade receivables ratio and the Tankan DI are positive across all three industries, while the correlation between long- and short-term loans and the Tankan DI tend to be negative. From these comparisons, it is evident that the pro-cyclicality of trade receivables and the counter-cyclicality of loans are common across industries, although the degree of cyclicality differs.

5. Accounting for Instrumental Differences in the Relationship between Trade Credit and Loans

There has been an abundant body of literature on the determinants of trade credit and its relationship with loans of financial institutions. Previous researchers have pointed out that non-financial businesses have certain advantages over financial institutions in

providing credit, including information about the credit-worthiness of borrowers, which they acquire through their daily commercial transactions. Many of these advantages are ascribed to non-financial firms making commodity transactions, which financial institutions do not and cannot undertake. Other researchers have emphasized the difference between these instruments since trade credit appears to be inseparable from the trade of goods, while loans are often distinct from commodity transactions. This section and section 6 address two issues. First is the relationship between trade credit and loans, when the same institution extends both forms of credit. Second are the responses of loans, extended by financial and non-financial entities, to trade credit shocks. In section 5, we control for differences in credit institutions by regarding trading companies as institutions that advance both trade credit and loans.

5.1. Previous Literature on the Relationship between Trade Credit and Loans

There are a variety of theoretical explanations for how trade credit is determined, as well as a variety of theoretical explanations of the trade credit-loans relationship. Petersen and Rajan (1997) discuss several of these theories. To reiterate, the financial advantage hypothesis stresses the informational superiority of non-financial firms over financial institutions in making loans or extending trade credit. Non-financial firms are better at acquiring more accurate and updated credit risk information on borrower firms through their daily commodity transactions. The hypothesis also emphasizes the advantages that non-financial firms have in salvaging value from existing inventories held by buyer firms, and in controlling buyers by threatening to cut off their supply of commodities.[23]

[23] Nevertheless, some practitioners believe financial institutions have more accurate credit information on borrowers. A main bank can trace its borrowers' flow of funds using bank accounts with the bank to determine the quantitative, as well as the overall, financial status of its borrowers. In contrast, trading companies are sometimes seen to have a narrow view of purchasers' credit risk through their own commercial

Based on the idea of financial advantage, Smith (1987), Frank and Maksimovic (1998) and Bond (2004) posit theoretical models of trade credit.

Price discrimination theory predicts that non-financial companies provide trade credit or loans to firms with higher credit risk in order to facilitate their sales to these financially constrained firms.[24] The final theory discussed by Peterson and Rajan (1997) is transaction cost reduction. The idea is that trade credit enables firms to bundle various payment commitments into one by synchronizing their payment dates, and, therefore, to reduce transaction costs.[25] Recently, Burkart and Ellingsen (2004) propose a diversion hypothesis, which emphasizes the different degrees of moral hazard between firms receiving cash from loans and those receiving inputs for trade credit.

The first two of these theories stress the institutional advantage that non-financial businesses have over financial institutions. Information acquisition, controlling the buyer, salvaging inventory value and stimulating the buyers' commodities demand are all part of the advantage. In addition, the means of financial assistance, whether loans or trade credit, do not matter to non-financial institutions. In contrast, the latter two hypotheses stress the instrumental differences between trade credit and loans. The implications of the two theories, however, are quite different.

Figure 5-1 illustrates the trade credit-loans relationship according to the transaction cost reduction hypothesis. Its presumption is that a firm has already decided to use credit before a creditor provides either a loan or trade credit. The firm then compares the transaction costs of either obtaining a bank loan, in order to pay for goods from a

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transactions.

[24] See Brennan, Maksimovic and Zechner (1988).

[25] See Ferris (1981).

supplier, or the cost of exchanging trade payables for goods. The more uncertain the firm is in the timing of the purchase, the cheaper it is to choose trade credit over loans.

In contrast, the diversion hypothesis, as illustrated by figure 5-2, presumes no commitment of purchase prior to procurement. Without any concrete purchase commitment, a firm need not simultaneously consider the transaction cost of purchase, procurement and payment. Burkart and Ellingsen (2004) introduce the notion of "diversion," which is when a firm uses financial resources for purposes other than those for which it was originally intended. An example of this is when a firm borrows money to purchase machinery, but instead uses those funds to pay its workers. The higher the probability of diversion, the more a creditor prefers that a firm apply for an instrument with a higher diversion cost, since its expected loss shrinks with difficult-to-divert credit instruments. "Diversion" coupled with the assumption that loans are cheaper than trade credit in their interest rate cost (meaning loans are preferred until rationed), results in trade credit being a secondary procurement measure in equilibrium.

Empirical studies on the determinants of trade credit have tested all the theories on the importance of institutional differences. Meltzer (1960) looks at the effects of monetary and bank loan contractions on the flow of trade credit from large to small firms. His findings are consistent with the predictions of price discrimination theory in which large companies advance trade credit to small firms in order to boost their sales. Petersen and Rajan (1997) use firm-level data,[26] and test a number of hypotheses on trade credit determinants. First, they suggest that non-financial enterprises obtain different information than financial institutions. They then show that trade credit is used more frequently than

[26] Their data are from the National Survey of Small Business Finance (NSSBF).

bank loans by high-growth, high-risk firms. Petersen and Rajan (1997) presume the reason to be information asymmetries between institutions. In addition, their estimation results are also consistent with non-financial firms salvaging value from inventories. Hence, they argue that their findings support the financial advantage hypothesis.

While tests of institutional differences have been frequently implemented, tests of instrumental differences have not.[27] An important caveat is that we cannot exclude the possibility that the characteristic differences amongst instruments are much more important than institutional dissimilarities, even when the empirical results are consistent with the former. Estimation results may be severely affected by the instrumental difference between trade credit and loans, but if they are not controlled for, there is no way to tell if the institutional factors are more important than others.

Empirical studies based on Japanese data, such as Takehiro and Ohkusa (1995), Ono (2001), Ogawa (2003) and Tsuruta (2003), are also susceptible to this problem problem. These researchers investigate the effects of financial institutions' loan conditions on trade credit. However, while they do mention the effect of information asymmetries between financial and non-financial institutions when interpreting the estimation results, they do not fully account for trade credit characteristics.

5.2. Trading Companies and the Relationship between Trade Credit and Loans

We previously discussed the fact that different types of creditors have different incentives to supply credit, thereby affecting the relationship between trade credit and loans. In this section we take up two questions about the trade credit-loans relationship. First, are there other elements affecting this relationship? Second, do characteristic differences

[27] Petersen and Rajan (1997, p 665) explicitly state that the transaction cost reduction hypothesis cannot be tested due to limitations with their data.

between these credit contracts dominate the relationship? We can answer these questions by adjusting for differences in creditor type. We analyze trading companies that make use of both trade credit and loans. Once we control across creditors we observe more similarities than simply the fact that these are both short-term credit instruments.

Recipients of these credit instruments generally overlap with one another since trading companies generally supply credit to those firms that they deal with in commercial transactions. The quality of credit risk information is identical across the various instruments since large trading companies integrate all the credit information in their own credit examination sections. These examination sections approve all credit transactions of the trading sections in charge of individual client companies. Also, collateral, for loans or trade credit, is treated identically, provided it is supplied by the same firm. We, therefore, expect loans and trade credit to move closely with one another if there are no significant factors, other than differences in credit institutions, affecting the relationship between the two instruments. These remaining "factors" affecting the relationship, include the individual characteristics of the different debt contracts.

In table 4-3 we observe that, after controlling for the creditor, the correlation of business conditions with the trade receivables to asset ratio, and the short-term loans to asset ratio are significantly different. However, these correlations do not control for factors other than business conditions and do not allow us to determine which of the two hypotheses regarding instrumental differences is correct. As discussed in the literature review, the two hypotheses emphasizing the importance of instrumental differences are each based on a distinct framework. As figures 5-1 and 5-2 illustrate the frameworks differ in terms of how closely purchases are tied to credit. When the provision of credit is closely

tied to the purchase of goods and services, a firm explicitly considers transaction cost reduction (figure 5-1). In contrast, when credit is not directly tied to the purchase, a firm considers the financial cost of each instrument (figure 5-2).

To distinguish between the theories we rely on two different economic shocks, namely output shocks and monetary shocks. Since output shocks directly influence the amount of goods and services transacted we can test the validity of the transaction cost hypothesis. To test the diversion hypothesis we analyze the impact of monetary shocks, to see if the disruption of credit availability forces firms to compare trade credit with loans purely based on their financial cost and benefit.

Our data are from the Financial Statements Statistics of Corporations by the Ministry of Finance and the Tankan Survey by the Bank of Japan. We focus on large (capital of at least ¥1 billion) wholesale corporations. The data are quarterly and cover the period 1967:1 to 2003:3. The dependent variables in our regressions are four ratios: trade receivables-assets, trade receivables-sales, loans-assets and loans-sales. Assets and sales are used to control for changes in the financial instruments due to changes in either the total stock of assets, or the flow of transactions. The explanatory variables:

(1) DI of Business Conditions (All industries and the wholesale industry)

A larger DI indicates better business conditions for corporations. It directly affects the transactions of goods and services and is a proxy for an output shock. It also stimulates the demand for funds to purchase goods and services. If firms prefer trade credit to reduce transaction costs, the coefficient on the DI should be positive for trade receivables. In this case, the coefficient on short-term loans should be negative, or insignificant, since loans are a secondary choice for procurement with goods transactions.

(2) DI of Banks' Lending Attitude (All industries)

This DI is the difference between the percentage of corporations that view banks as willing to lend and the percentage that view banks as unwilling to lend. We use this as a proxy for a credit, or monetary shock. A larger DI is an indicator of a better procurement environment for a firm. As pointed out in Ogawa (2003), it better represents the financial conditions of corporate Japan than other financial indicators, such as interest rates.[28] Due to higher procurement costs, credit provided by non-financial industries is generally thought to be more expensive than credit provided by financial institutions. But, trade credit also reduces the possibility of moral hazard on the borrowers' side, because of the higher cost of diversion. We infer then, that a firm regards credit from non-financial institutions as a secondary procurement measure needed only in the case of its bank loans being rationed. Moreover, when trade credit and loans are offered by the same non-financial institution, as a substitute for bank loans, the supplier is likely to prefer trade credit to loans because of the lower probability of moral hazard. For these reasons the coefficient on this DI should be negative for both trade credit and loans, with a larger absolute coefficient in the trade credit estimation.

(3) DI of Employment Condition (All Industries)

A smaller value of this DI indicates that a larger percentage of enterprises regard current employment as insufficient. In this case, there exists a larger demand for funds to hire additional labor. We include this proxy for employment funding demand in our loans estimations since labor costs cannot be financed through trade credit, which only manages the inter-firm goods and credit flow.

(4) Quarter dummies

We include quarterly dummies since the included variables are not seasonally adjusted. The dummies are especially useful when we divide by sales.

The estimation results are presented in Table 5-1. The coefficients of interest are on variables (1) (business conditions) and (2) (banks' lending attitude). Most signs are

[28] Since interest rates in Japan have recently been significantly near zero fluctuations in interest rates have been minimal.

consistent with our predictions, and many are significant. The results are consistent with table 4-3 where we observed positive correlations between trade credit and business conditions and negative correlations between loans and business conditions. The coefficients for business conditions are mostly positive for the trade credit estimations, and negative for the short-term loans estimations even after controlling for other factors in the regressions. These results support the predictions of the transaction cost reduction hypothesis.

We also find that when banks are unwilling to lend, trade receivables extended by the large-sized wholesale companies increase. This is in line with the literature, such as Meltzer (1960), which has pointed out that larger firms extend trade credit to their smaller counterparts in cases of financial distress. In contrast, loans provided by wholesale companies show no significant responses. It may be that large wholesalers prefer trade credit to loans because of the smaller expected loss from trade credit due to the higher cost of diversion.

In these estimations, we observe a significant difference between trade credit and loans even when they are offered by the same non-financial institutions. This holds even after we control for other factors such as labor costs, the flow of transactions and total assets. In addition, we test two hypotheses on the difference between trade credit and loans, and find that the results are generally consistent with the predictions of both of these theories.

6. Accounting for Institutional Differences in the Relationship between Trade Credit and Loans

In the previous section, we identified factors that affect the relationship between

trade credit and loans. Specifically, how closely tied the credit instrument is to its use, and the allowance for future uncertainties varies across these credit instruments. To determine if institutional differences, between financial and non-financial institutions, matter for the relationship between trade credit and loans we must now control for differences in financial instruments. In this section, we compare the response of loans extended by financial and non-financial entities to exogenous shocks[29] by using two different data sets. As in sections 4 and 5 we employ quarterly data from the Financial Statements Statistics of Corporations, but in this section we investigate the liability side of small- and medium-sized corporations. We also use firm-level data from the Survey of Financial Environment by Small and Medium Enterprises Agency of Japan (SFE) to identify the sources of loans obtained by borrowing firms.[30]

6.1. Aggregated Data: the Lending Behavior of Financial and Non-Financial Institutions

In contrast to the previous sections, which focus on the investment side of large-sized trading companies and compare loans with trade receivables, in this section we focus on the procurement side of small- and medium-sized companies. We compare loans provided by financial institutions to those provided by other firms. Meltzer (1960) notes that small businesses tend to receive trade credit from large-sized firms and so it is appropriate to analyze these firms as receivers of credit. In this subsection we calculate the correlation between business conditions and two loan ratios, loans by financial institutions to total assets and loans by other institutions to total assets for all industries and for

[29] It is of course impossible to compare the response of trade credit extended by financial and non-financial institutions since financial institutions cannot replicate trade credit. See Berlin (2003).
[30] For more on the SFE, see Small and Medium Enterprises Agency (2002, 2003) and Uesugi (2004, pp 7-8).

wholesale businesses.

Table 6-1 displays the results. In both samples, loans display a significant, negative correlation with business conditions regardless of the source of loans. The negative correlation is robust to the inclusion of ten lags. Though the data is aggregated, we may presume that many individual firms obtain loans, not only from financial institutions, but from other entities as well. Under this assumption, dissimilarities on the supply side will result in the loan ratios displaying different dynamics. Since we observe no such differences in signs we conclude that loans by financial institutions do not significantly differ from those extended by other businesses. Therefore, our results are not consistent with trade credit hypotheses based on institutional differences, such as the financial advantage hypothesis and the price discrimination hypothesis.

Furthermore, we observe a striking contrast when we combine tables 4-3 and 6-1. Within the wholesale businesses, trade receivables and short-term loans provided by large firms move counter to business conditions and within the same category of credit instrument, both loans by financial institutions and loans by other firms received by small- and medium-sized firms are significantly, negatively correlated with business conditions. These estimates imply that instrumental accounts are much more persuasive than institutional accounts in explaining the relationship between trade credit and bank loans.

6.2. Firm-Level Data

6.2.1. Firms Credited by Non-Financial Corporations

In this subsection we implement a more detailed investigation of the lending behavior of financial and non-financial institutions. With a number of non-balance sheet survey items available in the SFE, it is possible to control for other factors affecting the

supply and demand for loans. We begin by summarizing the characteristics of firms, including general trading companies that purchase goods and services from other general trading companies and/or obtain loans from non-financial institutions. SFE asks firms from which financial/non-financial sectors they obtain loans. Non-financial sectors include companies' representatives, their relatives, employees, affiliated corporations and selling and purchasing corporations. The SFE also contains the names of the principal suppliers to a company. This allows us determine from which firms the buying companies receive trade credit. This information is important in that it allows us to control for the companies receiving trade credit.

Table 6-2 presents the characteristics of firms for several categories: (1) firms that purchase goods and services from the nine major general trading companies, (2) firms that obtain loans from non-financial corporations and (3) firms satisfying both (1) and (2). Firms in categories (1) through (3) are larger on average than the sample average in terms of sales, assets, and number of employees. Firms directly purchasing from the general trading companies are usually large primary wholesalers, which is confirmed by their inclusion in category (1).

The composition of industries in categories (1) and (3) are skewed towards the manufacturing and wholesale industries. This illustrates how general trading companies locate themselves within distribution channels by not only supplying raw materials to manufacturing firms, but also working as sales agents for these same firms. In contrast, the composition of firms in category (2) resembles the make-up of firms in the entire sample. Also, procurement conditions are better for category (1) and (3) companies. Firms in these categories pay, on average, less for their procured funds, about 0.3% less than firms in

category (2), and firms in the entire sample.

6.2.2. The Lending Behavior of Non-Financial and Financial Institutions

Employing the firm-level data from SFE, we investigate trade credit-loan substitutability. Substitutability is investigated for firms obtaining loans solely from financial institutions, and for those obtaining loans from non-financial businesses. This allows us to determine the effect of institutions on the trade credit-loan relationship, which is a direct test of both the financial advantage hypothesis and the price discrimination hypothesis.

The dependent variable in our regressions is the change in the loans to total assets ratio between 2001 and 2002. Explanatory variables include:

(1) The change in the trade payables to total assets ratio
(2) The change in the trade payables to total assets ratio for firms borrowing from non-financial corporations

These two variables are used to test the financial advantage hypothesis and the price discrimination hypothesis. The two hypotheses contrast non-financial entities with financial institutions and predict significant estimates for the latter variable. Since trade payables and loans are likely to be simultaneously determined we need to select instruments for the trade payables variables. In section 5 it was made clear that trade credit is more closely tied to its use than loans. Since trade credit is used for the purchase of goods and services it moves with sales. Therefore, we use the change in the sales to asset ratio as an instrument for trade payables.[31] We also note that the relationship between trade payables and sales varies across industries and firm sizes.

(3) Industry dummies

[31] Sales can be endogenous if a trading company detects an increased credit risk and stops transactions. However, suddenly stopping transactions without concrete damages, such as dishonored notes, is considered an abuse of the superior status of the firm, based on the long-term relationship, in the Antitrust Act. This exposes large companies, including general trading companies, to possible litigation. Therefore, increased credit risk does not necessarily affect the sales behavior of large trading companies.

Industry dummies adjust for the inter-industry difference of factors affecting the supply and demand for loans.

(4) The scheduled amount of investment
(5) The change in the number of employees

These variables represent a firms' demand for capital and labor, which are expected to affect the amount they borrow.

(6) The ratio of cash and deposits to total in 2001

A measure of how illiquid a firm is, and, thus, how much liquidity it needs to obtain through loans.

(7) A government credit guarantee dummy

The Japanese government offers protection of bank loans when a borrower defaults. Upon receiving loans from financial institutions the borrower offers the government credit guarantee to lenders by paying an insurance premium. The supply and demand for loans are heavily influenced by whether the borrower is able to obtain a guarantee.

We use two samples for estimation: category (1) and the entire sample. For each, in response to a sales-driven change in the ratio of trade payables to assets, we examine the significance of the difference between firms with non-financial loans and those with only financial institution loans.

Table 6-3 presents the regression results. The coefficients on the change in the trade payables ratio are negative in all cases. This implies that trade credit and loans move in opposite directions over the business cycle. The degree of substitution, however, varies across samples. For the entire sample, those firms with non-financial institution loans have

significantly smaller coefficients, in absolute value terms, for the trade payables ratio change than average firms. A 1% point decrease (increase) in the trade payables ratio corresponds to a 1.65% point increase (decrease) of the loans ratio for ordinary firms, while for those with non-financial institution loans a 1% point decrease (increase) in the trade payables ratio corresponds with only a 0.57% point increase (decrease).[32] Conversely, in the category (1) sample, the coefficients are not significantly different. A 1% point decrease (increase) of the trade payables ratio corresponds to a 0.77% point increase (decrease) of the loans ratio for ordinary firms, which is not significantly different from the 1.06% point increase (decrease) for those with non-financial institution loans.

There are several ways to interpret the results. When we use the entire sample, loan supply behavior is significantly different between financial and non-financial institutions. This may be due to a possible capacity gap in collecting and processing credit information. Using the financial advantage hypothesis, we can infer that non-financial firms respond more quickly than financial institutions by exploiting their more precise credit information on borrowers. When sales decrease, trade credit drops, while the loan share of total assets increases regardless of the lending institution. However, the increase is smaller for firms with non-financial loans, than for those with only financial loans. This is consistent with the hypothesis that non-financial firms respond less positively to bad news (sales drop). Conversely, for firms transacting with trading companies, no significant difference in the coefficients is detected. In this case, the financial advantage hypothesis, or the price discrimination hypothesis cannot be immediately accepted.

In summary, non-financial businesses differ from financial institutions in their

[32] Firms that receive loans from non-financial institutions may also borrow from banks. The share of non-financial loans is 33% among category (3) firms implying that these loans are quite important.

response to outside shocks, even when we consider the same credit instrument (loans). However, once we compare financial institutions with general trading companies, a subset of non-financial entities with much stronger credit examination sections and a more conspicuous financial advantage over banks, we see no significant difference between the responses of loans. Consequently, by noting that some non-financial businesses are not significantly different from financial institutions in terms of supplying loans, we have a qualification to the importance of institutional differences. Of course, to ascribe the differences between the estimated values to supply side factors, we need to fully control for demand side characteristics. In our estimation with the entire sample, where firms with non-financial institution loans are significantly larger than the sample average, we must adjust loans demanded by firm size.[33] If not, the discrepancy in coefficients may be due to demand side factors.

7. Conclusion

In this paper, we focus on developing a clearer understanding of the relationship between trade credit and loans. Trade credit is supplied by non-financial businesses, while loans are advanced mainly by the financial sector. To compare trade credit and loans, we look at differences between creditors, and also at differences between credit instruments. Based on each of these differences, we separate the different hypotheses of the trade credit-loan relationship into two categories. While previous empirical studies have been ambiguous about which of the two categories is being tested, we are clear about which category we are testing, and are able to find that the hypotheses based on instrumental differences are possibly more important than those based on institutional differences

[33] In contrast, among category (1) firms, average firm size, and the size of those receiving non-financial loans are not much different.

(between banks and firms). This finding contrasts strongly with previous explanations of the trade credit-loan relationship, such as the financial advantage hypothesis, but is consistent with the new line of literature represented by Bukart and Ellingsen (2004) and Burkart, Ellingsen, and Giannetti (2004).

Another intriguing issue we take up in this paper is the behavior of trading companies, specifically the financial activities of these firms. One of the interesting features of trading company credit is that not only do these firms provide trade credit, but they also supply other forms of credit, such as loans, stock investments and loan guarantees. We find varying degrees of responsiveness of these credit instruments to business conditions. When we aggregate these instruments we observe a significantly stronger negative correlation between trading company credit and business conditions in recent years. A possibility is a higher degree of commitment, by the general trading companies, to prospective client firms through stock purchases or investment. The positive effects of these stronger commitments, however, have yet to be seen. What is needed is to track the performance of firms who have obtained funds from the general trading companies. Another qualification is that trading companies have limited the supply of credit to relatively large-sized small and medium enterprises. Nevertheless, trading company finance is still a major component within the current flow of funds in the Japanese corporate sector.

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Table 4-1: Asset Items Provided by the Nine General Trading Companies (¥ billion)

	Trade Credit (Receivables)	Net Trade Credit	Total Loans	Equities of Related Firms, Investments	Loan Guarantees
FY1960	679	48	27	16	73
FY1970	5083	722	300	130	687
FY1980	10652	1422	622	851	2744
FY1990	14086	1706	1546	1961	3457
FY2002	5347	1364	733	3738	3911

Source: Annual financial statements of the nine general trading companies

Table 4-2: Credit to all Japanese Corporations (¥ billion)

	Trade Credit (Payables)	Total Loans from Financial Institutions
FY1960	7959	8203
FY1970	45730	45700
FY1980	138162	166257
FY1990	227669	410247
FY2002	169782	370357

Source: Annual Financial Statements Statistics of Ministry of Finance

Table 4-3: Correlation between Business Condition DI and Financial Instrument to Total Asset Ratio (Large Wholesale Business)

	Trade Receivables	Other Liquid Assets	Long-term Loans	Stocks of Related Firms	Investments and other fixed assets (excluding stocks, bonds, and long-term loans)
DI(t)	+0.4895***	-0.2320**	-0.3869***	-0.5348***	+0.0149
t-1	+0.5072***	-0.2854***	-0.4578***	-0.5215***	-0.0257
t-2	+0.5063***	-0.2389***	-0.5000***	-0.5076***	-0.0617
t-3	+0.5014***	-0.2196***	-0.5155***	-0.4939***	-0.0828
t-4	+0.4779***	-0.1005	-0.4848***	-0.4856***	-0.1066
t-5	+0.4566***	-0.0102	-0.4183***	-0.4791***	-0.1144
t-6	+0.4258***	+0.1213	-0.3128***	-0.4676***	-0.1201
t-7	+0.3997***	+0.1994**	-0.2118**	-0.4529***	-0.1202
t-8	+0.3701***	+0.2905***	-0.1224	-0.4413***	-0.1301
t-9	+0.3585***	+0.3218***	-0.0517	-0.4401***	-0.1463
t-10	+0.3523***	+0.3384***	-0.0027	-0.4457***	-0.1723*
Beginning of Sample	1965/4-6	1965/4-6	1973/4-6	1975/4-6	1973/4-6

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Null is no correlation.
Notes: Financial Instruments are for large-sized wholesale corporations with at least 1 billion of capital. Due to previous changes in format, sample periods (start date) differ for some items. All samples end 2003/7-9. Other liquid assets include short-term loans. The Diffusion Index (DI) reflects business condition for the wholesale industry. In constructing the index, the percentage of firms regarding current business conditions as good is subtracted by the percentage regarding current conditions as bad.
Source: Financial Statements Statistics by the Ministry of Finance and Tankan Survey by the Bank of Japan

Table 4-4: Correlation between Business Condition DI and Ratio of Trading Company Finance to Total Assets

	75/4-6～84/10-12	85/1-3～89/10-12	90/1-3～2003/7-9
Correlation coefficients	-0.1256	-0.8607***	-0.5558***
Number of sample periods	39	20	55
	75/4-6～87/1-3	87/4-6～88/10-12	89/1-3～2003/7-9
Correlation coefficients	-0.0070	-0.8491**	-0.6260***
Number of sample periods	48	7	59

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Null is no correlation.
Notes: Credit Instruments are for large-sized wholesale corporations with at least ¥1 billion yen of capital. The Diffusion Index (DI) reflects business conditions for the wholesale industry, where the percentage of firms regarding current business conditions as good is subtracted by the percentage of firms regarding conditions as bad.
Source: Financial Statements Statistics by the Ministry of Finance and Tankan Survey by the Bank of Japan

Table 4-5: Credit Components of Wholesale, Manufacturing and Construction Industries (¥ billion)

	Trade Receivable	Other Liquid Assets	Long-term Loans	Stocks of Related Firms	Investments and other fixed assets (excluding stocks, bonds, and long-term loans)	Total Assets
Wholesale	17813	5789	2162	9560	2456	54682
Ratio to Total Assets	32.58%	10.59%	3.95%	17.48%	4.49%	
Manufacturing	41958	20636	4239	49732	13079	247069
Ratio to Total Assets	16.98%	8.35%	1.72%	20.13%	5.29%	
Construction	5183	3351	1035	2834	2470	33652
Ratio to Total Assets	15.40%	9.96%	3.08%	8.42%	7.34%	
All Industries	82424	44083	15087	85623	35667	579572
Ratio to Total Assets	14.22%	7.61%	2.60%	14.77%	6.15%	

Source: Financial Statements Statistics by the Ministry of Finance (2003/7-9) (large-sized corporations with capital of at least ¥1 billion).

Table 4-6: Correlation between Business Condition DI and Financial Instrument to Total Asset Ratio across Industries

	Trade Receivable	Other Liquid Assets	Long-term Loans	Stocks of Related Firms	Investments and other fixed assets (excluding stocks, bonds, and long-term loans)
Wholesale	+0.490***	-0.232**	-0.387***	-0.535***	+0.015
Manufacturing	+0.661***	-0.136*	+0.130	-0.353***	-0.312***
Construction	+0.078	-0.461***	-0.593***	-0.403***	-0.493***
All Industries	+0.530***	-0.055	-0.104	-0.436***	-0.288**
Sample Start	1965/4-6	1965/4-6	1973/4-6	1975/4-6	1965/4-6
Sample End	2003/7-9	2003/7-9	2003/7-9	2003/7-9	2003/7-9
# of Obs.	154	154	122	114	122

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Null is no correlation.
Notes: Credit instruments are for large-sized wholesale corporations with at least ¥1 billion of capital. Due to previous changes in format, some items differ in terms of sample start periods. All samples end 2003/7-9. Other liquid assets include short-term loans. The diffusion Index (DI) reflects business conditions for each industry, where the percentage of firms regarding current business condition as good is subtracted by the percentage regarding conditions as bad. For the construction sector DI, figures until 74/1-3 include the real estate sector.

Source: Financial Statements Statistics by the Ministry of Finance and Tankan Survey by the Bank of Japan

Table 5-1: Estimation of the factors affecting the trade credit and loans extended by large trading companies (OLS)

Explained Variable	Trade receivables/sales		Short-term loans/sales		Trade receivables/asset		Short-term loans/asset	
Business condition DI (All industries)	0.051		-0.126***		0.108***		-0.046***	
s.e.	0.033		0.018		0.024		0.005	
Business condition DI (Wholesale industry)		0.106***		-0.055***		0.116***		-0.021***
s.e.		0.027		0.013		0.019		0.004
Lending attitude of financial institutions DI	-0.182***	-0.166***	0.006	-0.010	-0.077***	-0.069***	0.003	0.001
s.e.	0.026	0.026	0.008	0.008	0.019	0.018	0.002	0.003
Labor supply-demand DI			0.137***	0.044*			0.059***	0.026***
s.e.			0.030	0.026			0.008	0.008
Quarter dummy 1	-13.48***	-13.36***	-4.839***	-4.753***	1.091	1.124	-0.803***	-0.776***
s.e.	2.427	2.323	0.699	0.763	1.743	1.665	0.200	0.227
Quarter dummy 2	1.491	1.259	0.754	0.454	-0.410	-0.594	0.086	-0.017
s.e.	2.427	2.323	0.708	0.771	1.742	1.665	0.202	0.229
Quarter dummy 3	-12.35***	-12.41***	-3.824***	-4.004***	0.535	0.494	-0.549***	-0.611***
s.e.	2.427	2.323	0.701	0.765	0.174	1.665	0.200	0.228
Adjusted R^2	0.445	0.491	0.471	0.369	0.222	0.290	0.388	0.210
F-value	24.36	29.19	22.63	15.23	9.35	12.95	16.44	7.47
Number of observations	147 (From 1967Q1 to 2003Q3)							

Notes: *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.
Source: Financial Statements Statistics by the Ministry of Finance and Tankan Survey by the Bank of Japan

Table 6-1: Correlation between Business Condition DI and Loans by Financial and Non-financial Institutions to Total Assets (Small- and Medium-sized Firms in All Industries and Wholesale Business)

	All Industries		Wholesale Business	
	Loans (financial institutions)	Loans(Other institutions)	Loans (financial institutions)	Loans(Other institutions)
DI(t)	-0.3297***	-0.4608***	-0.4709***	-0.5118***
t-1	-0.3235***	-0.4685***	-0.4678***	-0.5043***
t-2	-0.3125***	-0.4619***	-0.4530***	-0.5007***
t-3	-0.2920***	-0.4504***	-0.4214***	-0.4876***
t-4	-0.2701***	-0.4305***	-0.3898***	-0.4803***
t-5	-0.2451***	-0.4286***	-0.3507***	-0.4807***
t-6	-0.2250***	-0.4188***	-0.3187***	-0.4852***
t-7	-0.2078**	-0.4149***	-0.2861***	-0.4900***
t-8	-0.1999**	-0.4072***	-0.2784***	-0.4827***
t-9	-0.1933**	-0.3985***	-0.2817***	-0.4703***
t-10	-0.2090**	-0.3795***	-0.3022***	-0.4472***
Beginning of Sample	1965/4-6	1965/4-6	1965/4-6	1965/4-6

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level. Null is no correlation.
Notes: Credit Instruments are for small- and medium-sized all-industries and wholesale corporations with capital between ¥10 million and ¥100 million. All samples end 2004/1-3. Other liquid assets include short-term loans. The Diffusion Index (DI) reflects business conditions. In constructing the index, the percentage of firms regarding current business conditions as good are subtracted from those regarding current conditions as bad.
Source: Financial Statements Statistics by the Ministry of Finance and Tankan Survey by the Bank of Japan

Table 6-2: Firms with financial relationships with non-financial corporations (average)

	Firms purchasing from the nine major general trading companies (1)	Firms borrowing from affiliated, selling, or purchasing corporations (2)	Firms satisfying both (1) and (2)	(Reference) Entire sample
＜Business Conditions＞				
Sales	5902 million yen	6061	7928	3894
Current Profit	110	138	142	93
Total Assets	5026	6101	6715	3886
Trade Receivable	1378	1613	1729	895
Total Liabilities	3533	4898	5225	2779
Trade Payable	1102	1024	1499	648
Loans	1799	2978	2674	1547
Employees Number	105	136	179	88
＜Industries＞				
Construction	44 firms (6.9%)	46 (14.7)	4 (7.6)	844 (21.5)
Manufacturing	357 (55.9)	106 (33.9)	35 (67.4)	1338 (34.1)
Information and Telecommunication	2 (0.3)	2 (0.6)	0 (0)	36 (0.9)
Transportation	3 (0.5)	16 (5.1)	0 (0)	116 (3.0)
Wholesale	160 (25.1)	36 (11.5)	6 (11.6)	582 (14.9)
Retail	23 (3.6)	25 (8.0)	0 (0)	269 (6.9)
Real Estate	7 (1.1)	22 (7.0)	2 (3.8)	117 (3.0)
Restaurants	1 (0.2)	3 (1.0)	0 (0)	16 (0.4)
Service	23 (3.6)	29 (9.3)	3 (5.8)	381 (9.7)
Others	18 (2.8)	28 (8.9)	2 (3.8)	221 (5.6)
Number of observations	638	323	52	3920
＜Procurement conditions＞				
Highest short-term interest rate	1.785%	2.111%	1.857%	2.075%
Pressure from financial institutions (none)	55.8%	49.2	54.7	55.1
Pressure from financial institutions (higher rate)	22.4	21.1	26.4	19.2
Expand or contract of trade payable payment period	1.950	1.953	2.000	1.964
Number of Observations	660	323	53	4065

Notes: Measurement units of items from balance sheets are in millions of yen.
Category (1) companies state that they have one of the nine general trading companies as major sellers for them. Category (2) companies state that they have loans from their affiliated corporations, their selling and purchasing corporations, or other corporations.
Source: 2002 SFE.

Table 6-3: Estimation of the factors affecting the loans ratio change (OLS and 2SLS)

	Entire sample OLS	Entire sample 2SLS	Sample (1) OLS	Sample (1) 2SLS
Explained Variable	Δ(loans to total asset ratio)			
Δ(trade payable asset ratio)	-0.609***	-1.648***	-0.604***	-0.772***
s.e.	0.034	0.159	0.054	0.248
Δ(trade payable asset ratio)*(dummy for non-financial institution loans)	-0.026	1.081***	-0.454**	-0.292
s.e.	0.113	0.359	0.181	0.373
Industry dummy (construction)	0.020***	0.022***	0.029**	0.028*
s.e.	0.006	0.007	0.015	0.015
Industry dummy (manufacturing)	0.009*	-0.000	0.012	0.010
s.e.	0.005	0.006	0.009	0.010
Industry dummy (wholesale)	0.005	-0.004	0.008	0.006
s.e.	0.007	0.008	0.011	0.011
Scheduled Investment	0.000	0.000	0.000	0.000
s.e.	0.000	0.000	0.000	0.000
Δ(number of employees)	-0.0003***	-0.0003**	-0.000	-0.000
s.e.	0.0001	0.0001	0.000	0.000
Lagged cash and deposits to asset ratio	-0.028*	-0.043**	0.031	0.024
s.e.	0.017	0.019	0.031	0.033
Public credit guarantee dummy	-0.006	-0.004	-0.012*	-0.012*
s.e.	0.004	0.005	0.006	0.006
Explained variable in reduced form	Δ(trade payable asset ratio)			
F-value		15.85		3.45
Explained variable in reduced form	Δ(trade payable asset ratio)*(dummy for non-financial institution loans)			
F-value		33.99		23.95
Number of observations	3127	3127	533	533

Notes: Instruments to Δ(trade payable asset ratio): (ΔSales/Assets), (ΔSales/Assets)*(dummy for non-financial institution loans), (ΔSales/Assets）*(dummy for construction small and medium enterprises), (ΔSales/Assets)* (dummy for construction small and medium enterprises)*(dummy for non-financial institution loans), (ΔSales/Assets）*(dummy for manufacturing SMEs), (ΔSales/Assets)* (dummy for manufacturing SMEs)*(dummy for non-financial institution loans), (ΔSales/Assets）*(dummy for wholesale SMEs), (ΔSales/Assets)* (dummy for wholesale SMEs)*(dummy for non-financial institution loans)

*** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Source: 2001 and 2002 SFE

Figure 4-1: Balance Sheet Items to Total Asset Ratio for Nine General Trading Companies (aggregated)

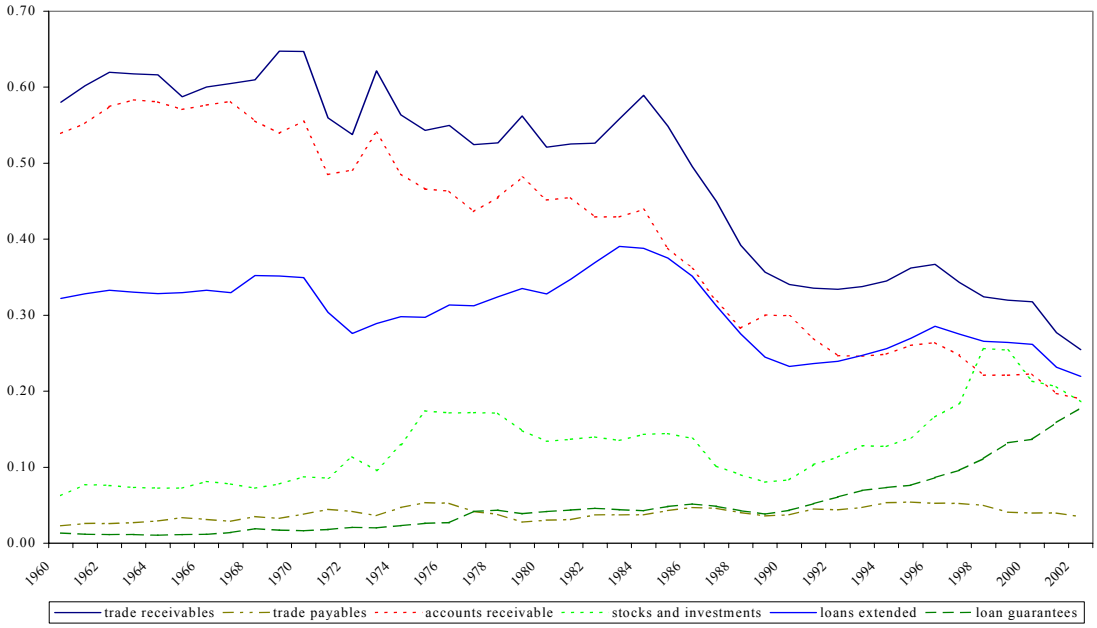

Figure 4-2: Balance Sheet Items to Total Asset Ratio for Large-Sized Wholesale Corporations (Capital > ¥1 Billion)

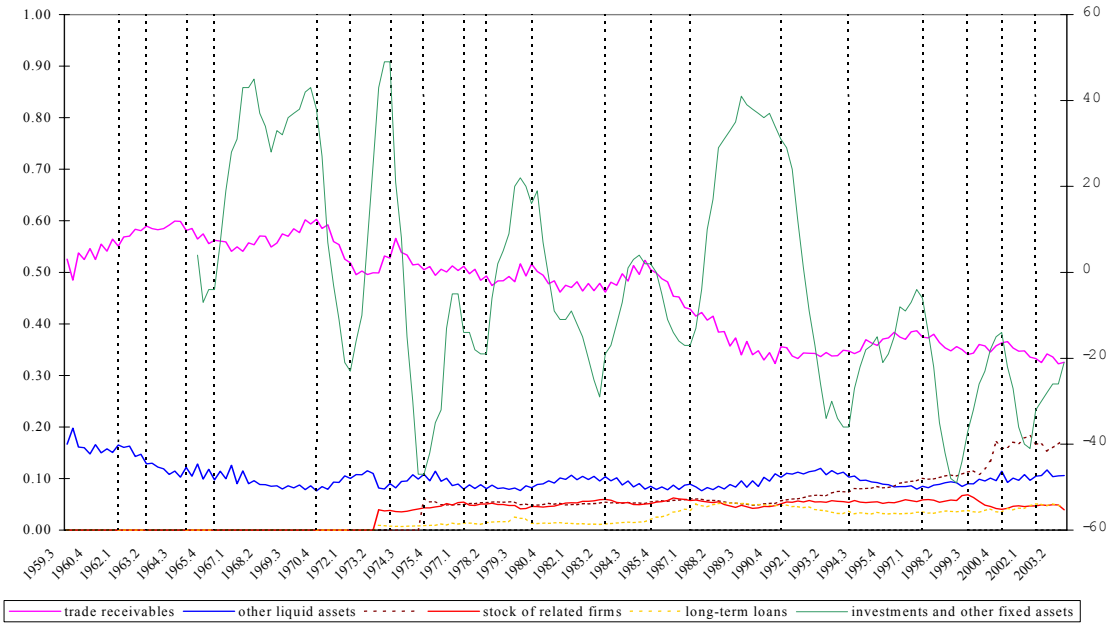

Figure 5-1: Transaction Cost Reduction Hypothesis

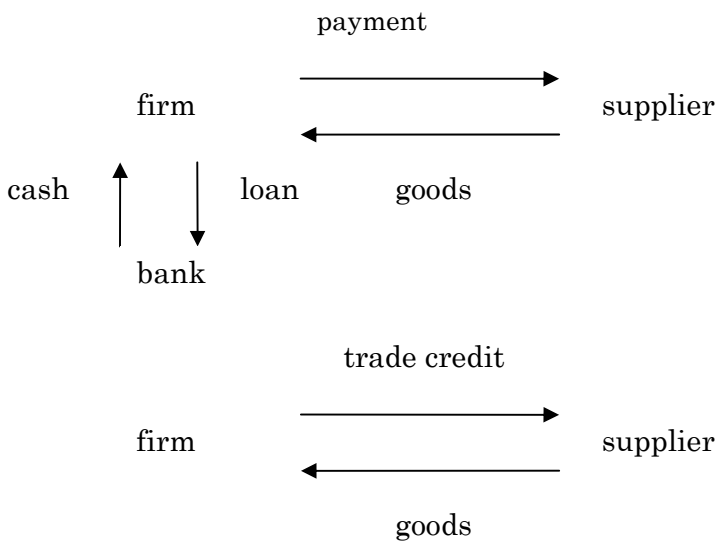
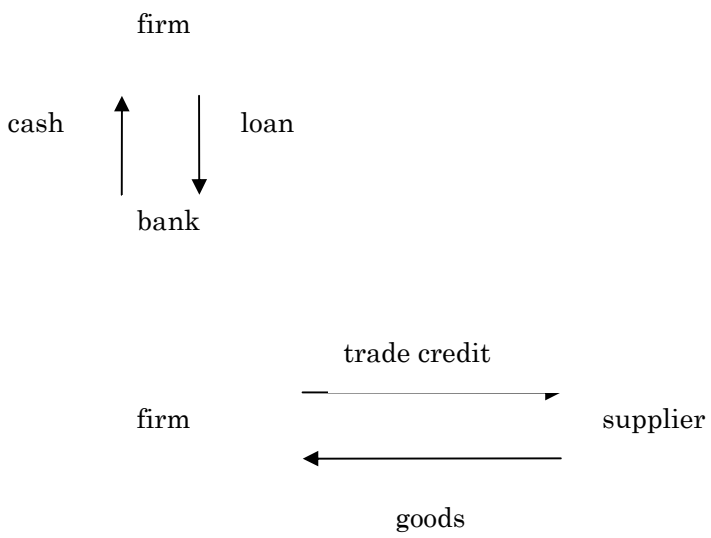
Figure 5-2: Diversion Hypothesis