A Study of Financing Behavior of Japanese Firms with Firm-Level Data from *Corporate Enterprise Quarterly Statistics* - 1994~2009: Introduction and Summary

Yoshiro Miwa
University of Tokyo

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Abstract

From early spring to late summer in 2010 I investigated the financing behavior of Japanese firms with over ¥10 million in paid-in capital, using firm-level financial data from *Hojin Kigyo Tokei Kiho* (Corporate Enterprise Quarterly Statistics) of the Ministry of Finance. "A Study of Financing Behavior of Japanese Firms with Firm-Level Data from *Corporate Enterprise Quarterly Statistics* – 1994~2009", divided into five discussion papers, constitutes the report. This Introduction and Summary forms the first of the five papers. The other four papers are:

[I]. The Low "Bank-Dependence Ratio" and the Further Increase in the "Independence of Firms from Banks".

[II]. The Reality of Short-term Shocks like the "Credit Crunch" of 1997-1999 and the "Financial Crisis" of 2007, and the Effectiveness of "Emergency" Economic Measures – A Follow-up to Miwa [2008].

[III]. The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (1) Overall Discussion and Preliminary Investigation.

[IV]. The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (2) Correlation Coefficients and Multiple Regressions.[2]

This *Statistics* collects quarterly financial data from about 20,000 randomly sampled non-financial firms in 5 size-categories, most of which are unlisted small businesses. Using firm-level data in 1994-2009, I investigate the financing behavior of the firms in Japan during "the Lost Two Decades." I explore the reality of the "Credit Crunch" of 1997-1999 and the "Financial Crisis" of 2007, the effectiveness of the policy measures adopted, and the effect of the "zero-interest-rate, quantity easing" monetary policy.

The most surprising finding is that the ratio of zero-short-term-borrowing was the highest, 50% in 1998 and two-thirds in 2008, among the smallest firms. The average (short-term bank borrowing)/(total asset) ratio was also lowest among this group. This "Independence from Banks" is a fundamental challenge to the basic premise of the conventional wisdom about the Japanese financial market and corporate finance.

Content:

[I&S-1]. Introduction

From early spring to late summer in 2010 I investigated the financing behavior of Japanese firms with over ¥10 million in paid-in capital, using firm-level financial data from *Hojin Kigyo Tokei Kiho* (Corporate Enterprise Quarterly Statistics; hereafter, CEQStat) of the Ministry of Finance. "A Study of Financing Behavior of Japanese Firms with Firm-Level Data from *Corporate Enterprise Quarterly Statistics* – 1994~2009", divided into five discussion papers, constitutes the report.

A wide variety of issues are discussed in this report, and this is one of the few occasions to make full use of this firm-level financial data. For this reason, this report is huge in size, approximately 400 pages, including a great number of figures and tables, approximately 800 in total.[3]

This Introduction and Summary forms the first of the five papers (hereafter, DP0). The other four papers are:

[I]. The Low "Bank-Dependence Ratio" and the Further Increase in the "Independence of Firms from Banks", CIRJE-J-223 (hereafter, DP1).

[II]. The Reality of Short-term Shocks like the "Credit Crunch" of 1997-1999 and the "Financial Crisis" of 2007, and the Effectiveness of "Emergency" Economic Measures – A Follow-up to Miwa [2008], CIRJE-J-224 (DP2).

[III]. The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (1) Overall Discussion and Preliminary Investigation, CIRJE-J-225 (DP3).

[IV]. The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (2) Correlation Coefficients and Multiple Regressions, CIRJE-J-226 (DP4).

This *Statistics*, CEQStat, collects quarterly financial data from about 20,000 randomly sampled non-financial firms in 5 size-categories, most of which are unlisted small businesses. Using firm-level data in 1994-2009, I investigate the financing behavior of the firms in Japan during "the Lost Two Decades." I explore the reality of the "Credit Crunch" of 1997-1999 and the "Financial Crisis" of 2007, the effectiveness of

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[3] In using firm-level data in government statistics in Japan, it is a rule to finish research within a predetermined period, return the dataset to the government, and publish the results as the reports like those discussion papers. Then anybody, including the researcher, would write academic papers, quoting figures and tables in the reports. As it is not easy to promptly conduct additional research with the same dataset, it is rational to prepare for the future potential needs, including a wide variety of many figures and tables exhaustibly in the reports.

the policy measures adopted, and the effect of the "zero-interest-rate, quantity easing" monetary policy.

The most surprising finding is that the ratio of zero-short-term-borrowing was the highest, 50% in 1998 and two-thirds in 2008, among the smallest firms. The average (short-term bank borrowing)/(total asset) ratio was also lowest among this group. This "Independence from Banks" is a fundamental challenge to the basic premise of the conventional wisdom about the Japanese financial market and corporate finance.

As the Introduction and Summary to the study, this paper is both for an introduction to and an overview of the study, briefly summarizing its parts. For this purpose I quote not a few figures and tables which symbolize the discussion. Fore more details of used variables and figures and tables, together with their explanation and discussion, I have to ask readers to refer to the related parts in DP1 ~ DP4.

For this reason, I place Roman numerical I ~ IV before the section numbers in DP1 ~DP4, respectively, and S&I to this paper. For instance, the section 2 of this paper is numbered [I&S-2], and the 3rd section of DP3 [III-3].

Preceding to this study, I had an opportunity to use this statistics, the result of which is published as "'Credit Crunch'?: Details from Borrower Quarterly Financial Data about What Actually Happened in Japan during 1997-1999" (CIRJE-J-202, August 2008; Miwa, 2008). This study newly planned upon the experience and results of this preceding study.

Relationship with Miwa [2008]

In Miwa[2008], I investigated individual firm's financing behavior, including borrowings from financial institutions, during the "financial crisis" or "credit crunch", from the end of 1997 to the beginning of 1999 in particular. For this purpose, I studied firm-level financial data of approximately 6,000 non-financial firms with more than ¥600 million in paid-in capital from CEQStat (Ministry of Finance) financial data, from FY1994 to FY2000.[4]

The dominant view and the conventional wisdom (hereafter, the conventional wisdom) argues that there was a serious "credit crunch" in Japan during this period, particularly between the end of 1997 and the beginning of 1999. I examined the short-term variations (quarter, semi-annual, and annual) in not only of borrowings from financial institutions (hereafter, bank borrowing: short-term borrowing, long-term

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[4] In Japan "fiscal year (FY)" begins in April. This statistics surveys information about all the non-financial firms with over ¥600 million in paid-in capital. In smaller size categories it surveys randomly sampled firms.

borrowing, and total borrowing[5]) but also of payables, receivables, deposits, and inventory, and also correlations between those financial variables. I found, however, no clear sign of serious "credit crunch". It is unclear on what ground the conventional wisdom is based, and little empirical supporting evidence is presented.[6] From this observation I concluded not to accept the argument that during the period from the end of 1997 to the beginning of 1999 there was a serious "credit crunch" in Japan. With its non-existence, I also concluded that the "policies" alleged to be adopted for its prevention and alleviation were ineffective.[78]

No serious criticism or rebuttal statement has appeared since the publication of Miwa [2008]. In the discussion on the development and countermeasures toward the worldwide "financial crisis (or panic)" that became obvious since July 2007, not a few argued to learn from the Japanese experiences (including policy failures) of a decade ago. If the suggested Japanese "experiences" is the conventional wisdom that is based on misconceptions and misunderstanding on the basic facts of the reality both of the "financial crisis" that actually occurred in Japan and of adopted countermeasures and their effectiveness, misunderstandings might lead to another more grave confusion and

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[5] Borrowing with remaining term less than a year is classified as "short-term", and otherwise as "long-term". Total borrowing is the sum of "short-term" and "long-term".

[6] For the details on this point, see pp.14~21 of Miwa [2008]. Observers have often referred to the DI (Diffusion Index) on "lending position of financial institutions" provided by the Bank of Japan as a supporting evidence of the serious "credit crunch". I wrote there (p.18) as follows. The next 3rd point is the most important. "Do the questionnaire and the firm's responses on which the DI is based include relevant and appropriate information positive users of this DI presume?" After careful examination, few would answer "YES" to this question, I predict. Unless being able to answer "YES" to this question, it must be impossible for reader to accept, upon a chart of this DI's movement, the conventional wisdom that there was a serious "credit crunch".

[7] With the collapse on 22 November 1997 of Yamaichi Securities, following the failure of Sanyo Securities on 3 and of Hokkaido Takushoku Bank on 17, the "financial crisis" reached full force in Japan, and that of Tokuyo City Bank on 26 followed. On December 5 the Ministry of Finance announced to protect all the bank deposits and financial bonds until March 2001. On 12 January 1998 in his speech to Congress Prime Minister Hashimoto declared that Japan would not trigger a global financial panic. The government was forced to take the control both of The Long Term Credit Bank of Japan on 23 October 1998 and of the Bond Credit Bank of Japan on December 13. It was on 12 March 1999 when the Financial Revitalizing Committee, created on 5 December 1998, decided the injection of public funds, ¥7.4592 trillion in total, to 15 banks. Even if the infusion worked well and played a critical role, already one year and four months had passed since November 1997. For more details, see the "Time-line of Events on Financial System: 1965-2002" in Nishimura [2003, pp.458-61].

[8] The discussion and conclusion of this research is based on firm-level data from Corporate Enterprise Quarterly Statistics. As a natural consequence, at least directly I do not study the influence of "credit crunch" on households, governments, financial institutions, or economic agents abroad.

tragedy (or comedy?).

In size categories smaller than ¥600 million in paid-in capital, at the beginning of each fiscal year (in April) CEQStat randomly selects all the firms to survey, and Miwa [2008] focused on firms with firms with larger than ¥600 million in paid-in capital. Because of this circumscription, there remains a strong interest in a question: "Did the same conclusion apply to smaller firms with less than ¥600 million in paid-in capital? Was the situation different?" Some seem to be frustrated, arguing: "It was credit crunch or banks' reluctance to lend to small businesses that was serious during that period, and it is off target like this study to focus only on large companies."

As shown below soon, however, in 2004 the average number of employees in firms in category between ¥100 million~¥1 billion paid-in capital was below 200, and with more than ¥1 billion was slightly more than 1,000. Neither persuasive theoretical ground nor powerful empirical evidence has been presented to support and confirm the validity of the conventional wisdom: "There was a serious credit crunch, particularly to small businesses." In Miwa [2008, pp.154-56], I tentatively countered to this kind of argument.

This research project began with a question: "Did the same conclusion apply to smaller firms with less than ¥600 million in paid-in capital? Was the situation different?" As all the firms surveyed are replaced every fiscal year, we cannot conduct completely the same investigation with firms in smaller size categories as in Miwa [2008].

With the exception of listed (large) firms, it is not easy to collect firm-level information on corporate financing behavior. In Japan the *Hojin Kigyo Tokei* (Corporate Enterprise Statistics, CEStat), Quarterly and Annual, is the only well-balanced statistics on firm's balance-sheet information like financing behavior, including small businesses (irrespective of its definition). Other frequently used information sources, such as "(customer) surveys" conducted by policy finance institutions or by Credit Guarantee Associations and its related organization like the CRD (Credit Rating Database) Association or various "researches" and "surveys" various government institutions like Small and Medium Enterprise Agency conduct when necessary, may naturally suffer from grave sample biases.[9] Curiously enough, however, in Japan

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[9] For instance, it is dangerous, from a customer survey conducted in a bar, asking "Do you love beer?", to straightforwardly draw a "conclusion" about the people's preference of beer. Several decades ago, many foreign observers were fond of reports that emphasized the high-cost structure of inefficient Japanese distribution system, which however were primarily based on the surveys of selling prices of imported products in department store's gift corners. Probably partly because of this, most foreign

well-known as a most committed country for small business policies I have little knowledge that the government has ever used positively the CEStat for the diagnosis of the necessity of small business policies, policy planning and implementation, or in evaluating their effectiveness.

The primary focus of this study is placed on small businesses rather than on big enterprises. Little well-balanced information has been presented concerning financing behavior of Japanese small businesses including borrowings from financial institutions, and therefore few know it in detail and accurately. With these two reasons, in this research I organize basic information about financing behavior of Japanese firms, focusing on small businesses.

A basic premise to most studies of Japanese financial phenomena has been the dominant role played by banks. Hoshi and Kashyap [2001, p.310] wrote that banks "were the only game in town". Observers argue that this bank dominance continued even after the "financial liberalization" of the 1980s, through which the largest firms obtained access to international capital market.

As shown in detail in DP1 (Discussion Paper 1), through the ages (for instance since the 1960s when the dual-economy view was widely accepted earnestly) the "Bank Dependence Ratio (borrowings from financial institutions/total assets)" of Japanese firms has been much lower than the conventional wisdom had presumed. In addition, recently (since the turn of the century in particular), the "Bank Dependence Ratio" further decreased drastically in firms of all size categories, which I call "further in crease in the 'Independence of firms from Banks'". Also, predicting to be able to easily confirm that the same conclusion of Miwa [2008] applies to small businesses (as shown below, it does), I reorganized the research design for this new project. As a consequence, I expand the focus from bank borrowings to deposits, receivables, payables, and inventory, and also their mutual relations.

Extension of the study period: from FY1994 to the 2nd quarter of FY2009

Focusing on the "Credit Crunch" in 1997-1999, Miwa [2008] studied the data over 7 years, from FY1994 to FY2000. The present research extends the study period to FY1994~the 2nd Quarter of FY2009, 15 and half years. The world financial market has changed drastically, particularly since the 2nd half of the 1990s, which is widely believed to be one of the causes of the "financial crisis" since 2007 and its protracting serious impacts. In relation to the turbulent days, particularly since the "Lehman Shock" in the

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distributors that entered the Japanese market exited in failure.

fall of 2008, the reality and policy responses in Japan during the "Lost Two Decades", including the Japanese experience in its "Credit Crunch" in 1997-1999 gather wide attention, often calling them cynically the "Japanese lessons". By extending the study period to the 2nd quarter of FY2009, we can study its impacts on firm's financing behavior in Japan. In addition, we can study the effects of the long lasting "quantity easing monetary policy under zero-interest-rate".

The conventional wisdom, dominant at least in Japan, argues that the recent "financial crisis" had influenced only slightly, if any, the Japanese economy, which differs substantially from that of the "financial crisis" or the "Credit Crunch" at the end of the 1990s. However, as shown in Miwa [2008] in Japan during 1997~1999 there was no clear sign of serious influence of the "Credit Crunch", and during the recent "financial crisis" I find in every size category of firms a dramatic decrease both in receivables and payables, particularly in the third quarter of FY2008, that is immediately after the "Lehman Shock".[10]

Under the historically unprecedented low-interest-rate policy of the Bank of Japan, the "Independence of Firms from Banks" further increased. Partly due to various policies toward bank's reluctance to small business lending, the only exception was that the ratio of long-term borrowings to the total assets of small businesses on average did not decrease.

Shift in research focus:
From influence of shocks to search and organization of basic information

At any point of time during the period under study and in any firm size category, I find no clear relationship between the variation of short-term bank borrowings and the variation of any other financial variable, for instance. The only exception is the one between receivables and payables, where, at any point of time during the period under study and in any firm size category, both between the ratio of receivables to and payables to total assets and between the ratio of the change in the amount of receivables to and payables to total assets. I find close relationship (extremely high positive correlation coefficient). I find no similar relationship even between either of them and inventory.

In this study I use two types of variables. Suppose y^i_t stands for the outstanding amount of financial item, short-term borrowings from financial institutions, for instance, and w_t the total assets, at time t. The first one, hereafter I call "level

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[10] If we classify it as part of the "shadow banking system", Japan suffered its serious contraction, we should say.

variable", l^i_t, is y^i_{t-1}/w_{t-1} (*100), and the second one, "difference variable", d^i_t, is $(y^i_{t-1} - y^i_t)/w_{t-1}$ (*100), (to be explained below in [I&S-3]).

Presuming that the "Credit Crunch" was serious and it made strong and clear impact on the Japanese firm's financing behavior, Miwa [2008] used only the latter "difference variables" in order to focus on observations and signs that would be identified as the consequence of the shocks. Unfortunately, however, the "credit crunch" was not so serious and little information and signs of its shocks were clearly identified. As a consequence, in Miwa [2008] I concluded simply that the "Credit Crunch" in Japan in 1997-1999 had no clear impact on financing behavior of Japanese firms. However, I could conduct no further research beyond this.

In this research, I shift the research focus to the search and organization of basic information, as a foundation for investigating the firm's choice among financing measures including borrowings from banks and trade credits. As a part, I focus also on the influence of the two "financial crises", in 1997-1999 and since 2007. In this perspective, I expected to find much more from studying "level variables" rather than "difference variables", and planned to pay more attention to the relationship between "level variables".

For example, placing focus on my finding, detailed in DP1, that the ratio of zero-short-term-borrowing was very high among firms in every size category, has rapidly increased in the last decade, and the highest among the smallest firms, I divide firms in each size category into two groups, firms with zero-short-term-borrowing and firms with non-zero-short-term-borrowing. I compared these two groups at each point of time, with "level variables", "difference variables", and relationships between variables. Intriguingly enough, I find no clear difference between two groups at any point of time. This result may depress many readers who expect noteworthy differences between firms that (could) choose "Independence from Banks" and those that do not.

For readers' and expositional convenience, I divide the study period, 15 and half years from FY1994 to the 2nd quarter of FY2009, into two parts, the first half of 8 years up to FY2001 and the second half of 7 and half years from FY2002, and in many cases I calculate the period average values. For example, as the long lasting "quantity easing monetary policy under zero-interest-rate" has been maintained throughout the second half period under which the "Independence of Firms from Banks" further increased, those comparisons would provide some hints for understanding its sources and mechanism.

Why *Hojin Kigyo Tokei* (Corporate Enterprise Statistics, CEStat), CEQStat in

particular, is useful and informative?

Above all, CEStat, CEQStat in particular, provides basic information about financing behavior of firms that are on the demand side of financial market, rather than institutions in fund management like financial institutions on the supply side.

In discussion phenomena concerning economic confusion and stagnation of the Japanese economy during the "Lost Decades (or Two Decades)", even when focusing on firm behavior, financing behavior in particular, typically the basic perspective adopted in the conventional wisdom has focused on the supply side of funds, particularly lending behavior of financial institutions including banks that have been recognized to dominate it. Obviously, however, firm's source of funds is not limited to financial institutions (and shareholders).

Funds borrowed by firms (households, governments, or foreign agents) from financial institutions are not always all used for their own business activities like production and facility investments (consumption, house construction, or various investments like R&D). Some of the borrowed funds may be invested in the financial market, used in increasing trade credits or obtaining shares in finance companies, which are finally obtained by firms on the demand side of the financial market. Firms use in financing necessary funds various financial markets where not only financial institutions but also many other types of agents including non-financial business firms take part in. In order to understand adequately the firm's financing behavior, we should expand the focus of study from lending behavior of financial institutions to financial markets, and study their roles and functions. If financial institutions were reluctant to lend money to small businesses, as has been alleged earnestly in Japan, by way of financial markets money lend to other borrowers may finally reach those small businesses. We should focus on financing behavior of firms on the demand side of the markets rather than lending behavior of financial institutions on the supply side. For this purpose, CEStat, CEQStat in particular, is the most useful and informative.[11]

Secondly, as mentioned above, CEStat (CEQStat) is the only random-sampled statistics in Japan that provides well balanced balance-sheet information about financing behavior of firms on the demand side of financial markets. On small businesses in particular, it is the only reliable statistics.

Thirdly, CEQStat surveys outstanding amounts of items on firm's balance

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[11] For questions like "What is 'the banks' reluctance to lend'?", "How serious has it been in Japan?", "What are the sources of trouble?", and "What can we and should we do?", see Miwa [2010a]. There may have been no such serious policy issues. Even when bank lending to small businesses has remarkably decreased, it may be because bank has lost the comparative advantage to competing business models or because it is inefficient.

sheet both at the beginning and at the end of each quarter (year for *Nenpo*, Annual Statistics), with which we see the actual amount of change in financial items during each quarter (year), for instance from April to June. In contrast, most other data-sets like securities filings of listed firms, Policy Investment Bank of Japan, or CRD are a collection of firm's accounting (annual) reports. It is based on each firm's choice of accounting term (year), which inevitably varies among firms. This variation and difference of period actually surveyed might be a decisive constraint, with which those data-set will be fatally misleading for investigating the reality and impact of "financial crisis" (or "credit crunch"), for instance. CEQStat (CEStat) is free from this variation.

Fourthly, firms raise funds from a wide variety of sources, and, as shown below, the ratio of funds from financial institutions like banks to the total assets has not been so high as is widely perceived. Traditionally, however, at least in Japan primary source of financial data have been provided by the Bank of Japan, most of which is collected from financial institutions. As a result, they place the greatest focus on the activities of financial institutions, like bank lending and deposit. A wide variety of financial activities and transactions in financial markets tend to be out of their direct concern, and little information about so many important items on firm's balance sheet is available in widely used financial data-set (or statistics). In contrast, by directly collecting data from financing firms, CEStat (CEQStat) provide rich information about items which have been neglected or viewed as unimportant by the authorities and researchers of financial markets. In this research, I place focus also on deposit, receivables, payables, and inventory.

Advantage of firm-level data

In addition to the points mentioned above, this study enjoys an advantage of firm-level data. Reflecting various factors and constraints, financing behavior of firms is too complex and diverse to capture with aggregate values or sample mean values, assuming a representative firm in each size category. Although CEStat (CEQStat) collects useful and informative data, by publishing the results basically in aggregates values its potentials have not been fully exploited.[12] By using firm-level data, we investigate in detail the issues beyond the reach of aggregate value data, and find valuable results.

Among the interesting results of the present study, it is the finding and

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[12] Obviously, aggregate values published in reports are quite informative, as shown in Section 8 of DP1 ([1-8]), but those published aggregate values have not fully utilized in the previous literature.

verification with firm evidence of phenomena which I name "the Independence of Firms from Banks", particularly of small businesses, that I consider to have the most important direct impact on the research of financial markets in Japan. Only with the firm-level data, I could find and confirm the phenomena.

The conventional wisdom, due to little interest of people including the financial authorities and researchers, argues roughly: "Trade credit is a financing method for inventory fund". A simple study of relationship between outstanding values of inventory and trade credits (receivables and payables) with firm-level data raises serious doubts to this view, however. By liberating ourselves from the spell of this kind of conventional wisdom, we will be able to begin a real study of firm's financing behavior, including trade credit and its relation with bank borrowings.

Content and composition of this paper

In this research, I study the financing behavior of firms, rather than lending behavior of financial institutions. Using firm-level data from CEQStat, I could examine a wide variety of issues, including the validity of arguments which most existing researches have long accepted as obvious and actively used as their common grounds. Some of the most basic grounds of the conventional wisdom about the Japanese financial phenomena are found to be false, upon which I could design and conduct new researches.

From this perspective, the most important finding of this research, which is also the most basic ground of this research, is the "Low 'Bank Dependence Ratio' (=borrowings from financial institutions/ total assets)" and "Recent Further Increase in 'Independence of Firms from Banks'" which is clearly observed during the study period since FY1994, after the turn of the century in particular. The view, symbolically written in Hoshi and Kashyap [2001, p.310] that banks "were the only game in town", is widely accepted and remains as the conventional wisdom not only about the financial market in Japan before the (alleged) process of "financial liberalization" in the 1980s bust also about most Japanese firms at present with the exception of small number of exceptionally excellent big companies which are allowed to use bond markets effectively. In contrast, however, ever since the 1960s the Bank Dependence Ratio of firms in every size category has been consistently much lower than had been widely perceived. During the study period, firm-level data show that in every size category the ratio of firms with zero borrowing (irrespective of whether it is short-term, long-term, or their sum) is extremely high and has consistently increased. Among firms with non-zero borrowing the bank dependence ratio has consistently varied markedly, and has recently decreased

in chorus.

This tendency is more obvious among firms in smaller size categories where the firms are recognized to have no other sources of funding than banks than among larger firms some of which with "liberalization" have become able to rely heavily on capital markets.

In DP1 I confirm in detail the "Low Bank Dependence of Japanese Firms" and the "Recent Further Increase in the 'Independence of Firms from Banks'" and discuss their implications (briefly I discuss the implications below soon in [I&S-2]). These observations imply that one of the most basic assumptions of research and understanding of financial phenomena and policies and regulations related to financial markets has been a myth substantially deviating from the reality. As shown in [I-1], the long-lasting policy debates about "banks' reluctance to (small business) lending", which symbolizes the "Lost Two Decades" (policy) controversy, might be groundless or based on a wrong assumption.

Beyond those points, focusing also on deposits, DP1 investigates the reality of firm (borrower)-bank (lender) relationship, its transformation and variations. The firm's "Low Bank Dependence" has not suddenly materialized in the 1990s. In the present study I used firm-level data for FY1994 and FY2009, so that using published summary statistics from Corporate Enterprise Annual Statistics (CEAStat) in [I-8] I show supporting evidence since the 1960s with long-run level and trend in Firm's Bank Dependence Ratio.

Placing the primary focus on smaller businesses in this study I intended to confirm the conclusion on Miwa [2008] about the reality of the "Credit Crunch, 1997-1999" to hold also with small businesses. However, it is to be seriously influenced by the "noise" that so many firms under study have zero-change in the outstanding amount of short-term borrowing from financial institutions, which is the primary focus of attention in Miwa [2008]. In addition, I find also the overwhelming majority of those firms with zero-change in short-term borrowing have no outstanding amount of short-term bank borrowing both at the beginning and end of the term. Without paying attention to this "noise" I studied the reality of "Credit Crunch" in Miwa [2008]. With two reasons, however, the influence of this omission of attention is rather slight. First, this further increase in "Independence of Firms from Banks" is remarkable in the 21st century in particular, and Miwa [2008] studied the period from FY1994 to FY2000. Second, this firm's "Low Bank Dependence" is more spectacular among smaller businesses rather than among large businesses Miwa [2008] studied.

DP2 first investigates the ratios of zero-short-term-bank-borrowing firms and

their time-dependent change. Then, separating-off the influence of those firms and focusing only on those firms with non-zero-short-term-bank-borrowing it investigates the reality of the "Credit Crunch" and confirms that the conclusion of Miwa [2008] applies to every size category of firms. After this, it also executes the same investigation on receivables, payables, and inventory (DI1 does the same on deposits).

DP3 and DP4 are for "The Reality of Trade Credit and its Link with Bank Borrowing and Inventory". Firm's "Low Bank Dependence" and recent further increase in its "Independence from Banks" imply that the predominant focus traditionally placed on firm's relationship with financial institutions, particularly bank borrowing, would be inappropriate and misleading in studying firm's financing behavior. When we table it as inappropriate, however, with the following basic puzzles, a huge variety of issues for investigation newly emerge: "What then are the alternative sources of funds?" "What are their relationships with bank borrowing?" and "What was the reality of 'Credit Crunch' and 'financial crisis'?"

The conventional wisdom has placed predominant focus on financial institutions, big banks in particular, in research and discussion on firm's financing behavior and more broadly on financial markets, which has strictly conditioned policy debates over financial markets. With this favoritism to banks or bank-oriented policy environment ("bank-centralism"?), firm's other financing means than bank borrowing have gathered only poor attention both of researchers and regulators, resulting in little information collection about related issues and poor accumulation of theoretical and empirical researches.

"Trade Credit" has long been widely recognized in Japan as credit instruments that "large firms" enjoying advantageous position in financial markets under the "dual structure" have adopted in supplying credit to disadvantaged "small businesses". It is, therefore, a result of arbitration generated by the "dual-structure" in financial markets, the conventional wisdom argues. This view, in collaboration with the "bank-centralism" (these two are the two sides of the same coin), has fatally impeded appropriate problem setting on related issues. As "shadowy figures", trade credit has gathered little attention, with poor accumulation of relevant information including statistics, with which research and discussion on relevant issues has little developed. Consequently, beyond a door newly opened by this research, there appears a rich research field, to be called "undiscovered wilderness (fertile land)" or "the dark (unknown or unexploited) continent of corporate finance", which throw us into a stupor, wondering where and how to launch the investigation. Of course, little information or understanding has been accumulated on the development of trade credit during the period of credit squeeze

policy and the "Credit Crunch" and their relationship with borrowing from banks.

In this research, because of its popularity, size, and data availability, as the first step toward alternative sources of funds, I focus on "trade credit" like receivables and payables. In DP3, the first half of trade credit study, subtitled "Overall Discussion and Preliminary Investigation", first using aggregate summary statistics from CEAStat I review the long-run trends in relevant observations, and next as a preliminary investigation I generally discuss the mutual relationship among trade credit, borrowing from financial institutions, and inventory. On that basis, as the first step of investigating the relationships among relevant variables I compare the two groups of firms, firms with non-zero-short-term-bank borrowing at the beginning of the term (type A) and firms with zero-borrowing (type B).

In DP4, subtitled "Correlation Coefficients and Multiple Regressions", first I study correlation coefficients between variables, and find that with the sole exception of the ones between receivables and payables almost nowhere and at no time I find high correlation coefficients between financial variables, like between short-term bank borrowing and receivables, payables, or inventory. Focusing on this sole exception of consistently high correlation coefficients between receivables and payables, I run multiple regressions both on their "level variables" and "difference variables". In either case the relationship between dependent variable and regressors are consistently stable and similar, in that the regression coefficients, t-values, and Adjusted R-squares are consistently stable and similar.

Objectives and characters of this research

It has long been the conventional wisdom about the Japanese firms and the economy that financial institutions, big banks in particular, dominate the financial markets where firm's financing behavior decisively depends on borrowing from those institutions. As the dominant view it has maintained an overwhelmingly strong influence on research and policy debates in related fields. This view as a basic foundation has definitively conditioned the relevant researches and policy debates. The low "Bank Dependence" of Japanese firms and recent further increase in their "Independence from Banks", to be detailed in DP1, implies that this foundation is a misconception and misunderstanding, that is, it is a myth that fatally deviates from the reality of the Japanese financial markets.

This research begins with this finding, which is like a discovery of the New World or a continent widely believed not to exist. Under the predominance of the conventional wisdom, the financial markets in Japan has been like a vast desert where

without a close relationship with one of big banks that provide support, assistance, and guarantee any firm is unable either to pursue normal activities or to survive. The new finding implies that, contrary to the conventional wisdom, in the Japanese financial markets it is not indispensable to establish and maintain a close relationship with a bank not only to survive but also actively pursue normal activities. Thus, this research begins with a major discovery, a breakthrough.

Upon this major discovery, putting the conventional wisdom on the shelf, in DP1, I focus on the relationship between firms and financial institutions and organize information about related issues. In DP2, taking deposit, receivables, payables, and inventory, together with bank borrowing, into consideration, I organize information concerning both the ratio of each item i to total assets, $l^i_t = y^i_{t-1}/w_{t-1}$, and the ratio of change in each item i to total assets, $d^i_t = (y^i_{t-1} - y^i_t)/w_{t-1}$. Here, as part of the investigation, I go into the details of the reality in Japan of the "Credit Crunch" in 1997-1999, the "financial crisis" since 2007, and the long-lasting extreme-easy-money policy.

Once we recognize the low "Bank Dependence of Firms" and recent further increase in "Firm's Independence from Banks", it is natural for many to newly direct their attention to the details of alternative financing measures and the relationship between them and bank borrowing. Focusing both on "trade credit" like receivables and payables as representative alternative financing measures and on inventory which the conventional wisdom argues to be a major application of trade credit, DP3 and DP4 investigate their realities and mutual relationships. Under the overwhelming influence of the conventional wisdom about the financial markets, however, "trade credit" has been "a shadowy figure". Most people have known it as an expression, but neither have had clear image nor recognized its reality in detail.

Consequently, little information was available as its basis and preparation, with which I had to start this new exploration. This research could be a report of blind-way-exploration only to collect and organize relevant information. This part of the study is neither a hypothesis testing based on careful theoretical discussion nor an exploration with well-defined destination and objective, although it might be useful as its preparation and basis. The discussion covers a wide variety of issues, and with the exception of several conclusions on the errors of the conventional wisdom it neither enumerates "conclusions" nor shows a "summary". Collection and organization of basic information about "trade credit", which not only has rarely been seriously investigated but also not very often has come to an issue, would initiate the interest of many readers.

For example, during the recent "financial crisis", often we heard a commentary: "Because the shadow-banking system is undeveloped, what has become apparent in

financial market in the US and Europe in the last decade is a problem of the remote future in Japan." Right and wrong of the big changes that occurred in the world financial market that preceded the "financial crisis" is not an issue here. The reality of its relation to the financial market in Japan and the investigation of the conventional wisdom about related points are not, either. Recognizing the low "Bank Dependence of Firms" and the recent further increase in "Independence of Firms from Banks", many readers in earnest would raise puzzles: Where and how firms obtain funds for their activities, other than borrowing from banks?; Have the same kinds and types of changes and transformation occurred "there" in Japan, too?; Isn't the relative stability in the Japanese market during the recent financial crisis just by accident or simply unrecognized by many? In order to secure the stability of financial system, and smooth operation of the Japanese economy, it must be definitely important to explore "the dark continent of finance" that widely extends outside the traditional "financial sector" comprised of financial institutions of the traditional type.

I really hope the development of future research over a wide variety of issues on the causes, generating mechanism, and influence of the low "Bank Dependence of Firms" and recent further increase in "Firm's Independence from Banks" in Japan.

I discuss the implications of this research in the next section.

Roadmap

The objective of this research is a full-fledged organization of basic information about financing behavior of Japanese firms, small businesses in particular, critically reviewing the dominant view or the conventional wisdom about related issues. Consequently, it covers a wide variety of issues and directly draws few clear "conclusions", with which it does not fit in so easily with a brief summary. [I&S-2] discusses the implication of the results, important research agenda for future research and discussion this research would provoke and their potential achievements. [I&S-3] briefly introduces the Corporate Enterprise Quarterly Statistics (CEQStat) and its data, with basic statistics, and variables I use in this research. Each section from [I&S-4] to [I&S-7] introduces four discussion papers, DP1~DP4, respectively. In place of summary of investigation, [I&S-8], entitling "Interesting Observations", lists points and observations that I found on the process of the study and still remain impressive and interesting to the author at its close, which I believe useful for readers in understanding the importance and in promoting the use of basic information about financing behavior of the Japanese firms, small businesses in particular, organized in the report. [Appendix] includes "abstracts" of 4 DPs.

[I&S-2]. Implication

[I&S-2] discusses the implication of the results of this research. As the process up to this point has already been long, steep, and tough, for a reader in a hurry it might be better to leap to [I&S-3] and after (or after having a glimpse of the whole report), and then return to this "Implication".

Two basic points for this research

Upon two basic points this research conducts a full-fledged organization of basic information about financing behavior of Japanese firms, small businesses in particular, critically reviewing the dominant view or the conventional wisdom about related issues.

The conventional wisdom that financial institutions, big banks in particular, have dominated the Japanese financial market and played there the key roles has long been an obvious basic assumption in research and policy debate over the Japanese financial phenomena. First, this research begins with pointing out that this conventional wisdom is and has been a misunderstanding and misconception, a myth fatally deviating from the reality. Consequently, from the start to the end, the content of this research has a wide variety of and grave implications both to research and policy discussion on financial market issues.

Among the sectors obtaining funds from the market, corporate sector, therefore firms, small businesses in particular, has gathered the greatest interest both of the researchers and policy makers. Second, at least partly because of the stable dominance of the conventional wisdom as a foundation in research and policy debate in Japan, CEStat, CEQStat in particular, that provides relevant statistical information by far of the best quality, has rarely been used effectively in research on financial phenomena or policy debate. It is extremely productive to show in detail that active use of CEStat, its firm-level data in particular, is effective in escaping from confusion, chaos, and calamity based on the misconceptions. In light of the predominance of the conventional wisdom in Japan, this second point might be the most basic message of this research.

Consequently, this research covers a wide variety of issues and directly draws few clear "conclusions". It provides a set of basic information that would provoke important research agenda for future research and discussion, leading to great achievements. Therefore, the list of implications shown below can not be exhaustive, but just part of candidates with great potentials. Obviously, they are not "conclusions" drawn from the research.

If the conventional wisdom is a myth that substantially deviates from the reality…

It has been the conventional wisdom that financial institutions, particularly big banks, have long dominated the Japanese financial markets where they played overwhelmingly important roles. Most issues discussed in this research are related with the conclusion that this conventional wisdom is a myth that has fatally deviated from the reality.

As shown in DP1, during the study period of FY1994~FY2009, after the turn of the century in particular, the "Independence of Firms from Banks" dramatically increased. Even in the 1960s, the heyday of the "dual economy" theory, the firm's "Bank Dependence Ratio" was not so high as was widely perceived, which had remarkably decreased before the beginning of the 1980s, even before the "Bubble Years".

The conventional wisdom argues that, with the "liberalization" of the Japanese financial market in the 1980s, outstandingly excellent super-big companies (by far bigger than the most firms with more than ¥600 million in paid-in capital surveyed in Miwa [2008]) became able to actively use capital market through issuing securities like SB, CB, and WB, resulting both in the increase in their "Independence from Banks" and in the emergence and expansion of the bubble. Those excellent big companies evaded the banks' monitoring and banks in turn were obliged to make huge loans to unknown borrowers. Those two factors interdependently emerged the huge "Bubble", with which as a consequence banks were to have troubles with huge amount of bad loans.[13]

In this view, it is only outstandingly excellent big companies that could become "Independent from Banks". It is important to note that it implies that the conventional wisdom remains dominant even today, for which it has been a basic assumption that for instance for small businesses "banks are the only game in town". Up until the present it has been unclear on what theoretical and empirical grounds this view was proposed and obtained a wide support.[14] As shown in DP1, the view as a basic assumption of this conventional has never been valid since the 1960s. During the study period of this research, it was small businesses that the most drastically increased the "Independence from Banks". Although in this research I do not explore the relationship between the increase in the "Independence from Banks" of Japanese firms including small businesses and the "liberalization", it is implausible that the "Independence" would not

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[13] This view, however, is a myth fatally deviated from the reality. On the unreality of this conventional wisdom about the rise and fall of the Japanese "Bubble", see Miwa and Ramseyer [2005a], or in brief Chapter 1 of Miwa and Ramseyer [2007].

[14] On this point briefly, see [I-1] of DP1.

have increased without the "liberalization".

At least since the 1960s[15] the "Bank Dependence Ratio" of Japanese firms was low and has consistently decreased. Since the bust of "Bubbles", particularly during the long lasting "quantity easing monetary policy" in the 21st century, the Ratio decreased further. Up until the present the conventional wisdom has adopted as an obvious assumption an overwhelmingly high "Bank Dependence Ratio" (and also it assumes that before the "liberalization" competition among financial institutions had been effectively restricted), in which each firm has been assumed as if it were a fish fed in a pond maintained and controlled by each financial institution.[16] From this assumption, following 5 views emerge, which in total constitute the conventional wisdom.

(1)   It is not easy for firms, particularly for small businesses, to be in a privileged pond prepared by a big bank. When allowed, small businesses are treated as marginal members and often suffer major damage from bank's reluctance to lend to small businesses.

(2)   Being nervous for disadvantageous treatment, small business tends to avoid a privileged pond prepared by a big bank or to make access to other ponds prepared by other banks simultaneously. Moreover, when the fear rises to the surface, it is necessary to move to another pond. Such countermeasures are not easy to adopt and incur a huge additional cost.

(3)   Asymmetric information between lending bank and borrowing firm plays a critical role, with which it is not easy for borrowers to move across ponds. Firms intending to move across ponds fatally suffer from the well-known adverse selection mechanism. In addition, because of this information asymmetry, maintaining lender-borrower relationship with many banks incurs tremendous cost.

(4)   The performance and even the survival of a firm heavily depend on the establishment and maintenance of a close trade-relationship with a specific bank. Close relationship with a bank, often called *keiretsu* relationship, main bank relationship, or relationship banking, is in both of their interests, has prevailed widely particularly in Japan. It is one of the key components of the "Japanese economic system" that enabled the postwar economic recovery and

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[15] It seems the situation was the same even before the 1960s. For the situation in prewar Japan, see Miwa and Ramseyer [2002]. Because of the availability of the consistent data from CEAStat, I go back only to the 1960s.

[16] For a recent standard view, the conventional wisdom, about the "state of and problems in small business finance", see Shimizu [2010].

development in Japan.

(5) Close bank-firm trade relationship, prevalent between big bank and big company in particular, has achieved great results. Concerning small businesses, it should have been a big policy concern to promote establishing close bank-firm relationships. With recent "relationship-banking" promotion policy, the benefit of this relationship has begun to spill over to small businesses that had little enjoyed it.

Over at least half a century, including the days from the high-growth and prosperity to the stagnation often expressed as "the Lost Two Decades", as a basic assumption this conventional wisdom has dominated the research and policy debates about the Japanese financial market. With this research, both this conventional wisdom and the above mentioned views based on it will lose the grounds. They will be pushed for a serious re-examination.[17]

One of the expressions that symbolize the Japanese economy after the burst of "Bubble", often called "the Lost Two Decades", is the "banks reluctance to lend" (*kashishiburi*). Despite of long lasting severe condemnation against banks, a series of small business policies including "coercion" of bank lending to small businesses, and expansion and further alleviation in conditions for "credit guarantee", the condemnation against banks' reluctance to lend has little decreased. It might be because of a wrong diagnosis that it is a "disease", with which adopted treatments have been ineffective. Even for most small businesses, their "Bank Dependence Ratio" has been lower than the level the conventional wisdom had assumed, and recently they increased further their "Independence from Banks". A straightforward interpretation of this observation, detailed in DP1, might be that it is because other financing measures available for firms are more profitable than bank borrowings, to which it is profitable for banks not to challenge".[18]

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[17] It is generally understood that the influence of "asymmetric information" between lender and borrower is above all serious for small businesses. In Japan, however, in most cases bank lending to firms, including small businesses, have been executed on condition that borrowers pledge collateral or personal security, with which trading parties have avoided the influence of "asymmetric information". On this point, see Section 4 of Miwa [2010a]. Often emphasized "bank monitoring" has rarely played a critical role. On the overvaluation of monitoring function of Japanese banks, symbolically that of "main banks", see Chapter 7 of Miwa and Ramseyer [2007], especially 7-10, or in brief Chapter 4 of Miwa and Ramseyer [2006].

[18] Obviously, it does not deny or reject an interpretation like "it is because banks are reluctant to lend to firms" or "banks impose too strict lending conditions". However, reader should ask "Why banks do not lend?" "Why banks lose market by imposing too

If the assumed position and role of banks in financial market is overrated....

The conventional wisdom about the overwhelmingly important position and role in the Japanese financial market of financial institutions, banks in particular, has been a myth substantially deviating from the reality. It implies that the conventional interests, concerns, and hopes about banks, particularly big banks, and their behavior have been overrated.

For instance, the "Financial Crisis" or "Credit Crunch" in Japan at the close of the 1990s seems more to be a "crisis" or panic of financial institutions and financial administration. Overvaluing the influence of "collapse" of several financial institutions including big banks, the government postponed the enforcement of necessary measures in order to avoid their realization. In the upshot, (emphasizing that there is little possibility of such kind of occurrence, or using it as an excuse) the government that had prepared little countermeasure, and the public, had to face a series of financial institution's collapses and grave policy confusion. As shown both in Miwa [2008] and DP2 of this research, at least from borrowing firms on the fund raising side, I do not find prominent phenomena to be recognized as an indication of "Credit Crunch".[19]

It is not because the government adopted appropriate policies that worked effectively. A series of collapse of financial institutions began in the fall of 1997. It was on 5 December 1998 when the Financial Revitalizing Committee was created based on newly established two Financial Stabilization Acts, and it was on 12 March 1999 this Committee decided the injection of public funds, ¥7.4592 trillion in total, to 15 banks.[20]

strict conditions?", and "Will it improve national welfare to criticize banks behavior as 'reluctance to lend' and enforce policies as its countermeasures?" Suppose a consumer on an empty stomach, who with no money asked a restaurant to feed adequately and was refused, criticizes the restaurant: "You have a huge stock of food... It's a restaurant's reluctance to sell!" It may be informative and useful to ask, "What difference is there?" On this illustration, see the discussion entitled "'reluctance to lend' or 'reluctance to borrow'?" at the end of [1]. Introduction in Miwa [2010a]. Furthermore, coercing banks to increase lending to small businesses as a countermeasure might be like coercing department stores that in response to the rise of discount stores pulled cameras and home electric appliances from their shelves to put them all back or to increase their sales radically. It might be only those involved in the "banks' reluctance to lend" fiasco, together with politicians and government sections in charge, who are happy with the policy. For most (potential) borrowers and lenders, and also for most of the public, it might be a symbol of waste and against their interest.

[19] Note that this research is based on firm-level data from CEQStat. I do not take into consideration the influence on other agents such as households and the governments.
[20] See the above note 7 for a brief course of development. Reader should ask carefully: "Did the public fund injection worked effectively and greatly contribute to the 'financial stability'?" and "Did this injection improve the national welfare?" If the "disease" this

Both the fear of collapses of financial institutions including *jusen* (housing loan companies), big banks in particular, and the seriousness of its influence and confusion might have been overrated, or intentionally exaggerated. Upon a wrong assumption that is simply a "myth", its often emphasized "cost" associated with the well-known expression, "too big to fail", had been left unexamined and without careful evaluation.[21]

"Disposal of bad loans" and policies against "banks' reluctance to lend"

It was once a fashion in Japan to call financial institutions that in effect went bankrupt but survived with the protection, assistance, or policy of the government "zombie banks".[22] There has been a strong and wide support to the view that the survival of financial institutions once fell into bankruptcy but stayed in business with the government intervention has been one of the causes of long lasting stagnation in the Japanese economy since the 1990s. Those two observations seem to be based on overvaluation of the position and role of financial institutions, big banks in particular.

During the period from the late 1990s to the 1st half of the 2000s, the Japanese government enthusiastically promoted as "the top priority of tasks in economic policy" and coerced financial institutions "the disposal of bad loans", which however might have fundamental flaw of the same kind and should be reviewed carefully. In Japan "zombie lending" became more popular than "zombie banks". It placed more focus on "lending" behavior of banks as lenders than on their "obligation" of banks as borrowers.[23] Although none of the exact meaning, generating mechanism, or correspondence with "zombie banks" is clear, it seems to focus on the "slow speed" of "bad loan" disposal by

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"treatment" targeted (or alleged to target) was slight or non-existent, the performance evaluation of the treatment would be minor (or negative).

[21] Readers who wonder that, although so many love to refer to the phrase, "too big to fail", too few go into its details and necessary measures for its prevention should see John Kay, "'Too big to fail' is too dumb to keep" *Financial Times*, 28 Oct. 2009.

[22] According to Calomiris and Mason [2004, p.409], Kane[1998, p.5] for the first time used the expression of "'zombie' banks", meaning that "can continue almost indefinitely, and it is very hard to measure their insolvency". He explains a "zombie" institution: "Its ability to renew its deposit funding and its foreign debt depends entirely on the continuing credibility of the explicit and implicit government guarantees that official policies attach to its obligations". Fukao [1998] that includes "zombie bank" in its title use this expression with explanation (p.50): "A financial institution that, after once falling into bankruptcy, stays in business without management discipline, like a zombie".

[23] I leave to readers to the comparison and examination of relationship between "'zombie' banks" of Kane[1998] and "zombie lending" of Cabarello, Hoshi, and Kashyap [2006], and their related definitions and explanations.

financial institutions.[24]

As a policy against "banks' reluctance to lend" to small businesses, in Japan since the 2nd half of the 1990s small business policies have been implemented in a scope wider and in a scale larger than in the 1960s, the hey day of the "dual economy" theory. With the recent reduction in the size of public works expenditure that has consistently been allocated preferentially to small businesses, small business policies have increased the weight of financial policy measures, particularly by expanding the size and scope of "credit guarantee" policies. "The Special Credit Guarantee Policy" during 1998.10~2001.3 is the most representative. Again, this policy scheme is based on the conventional wisdom about the overwhelmingly important position and role of financial institutions, big banks in particular, which is also based on the "dual economy" theory drawn from an assumption (obviously infeasible and implausible, it seems) that financial institutions as a concerted action maintain discriminatory actions against small businesses.[25]

Consequence of too much emphasis on and favoritism toward banks, "bank centralism"?

The authority and government agencies in Japan like the Bank of Japan, Financial Service Agency, and Small and Medium Enterprise Agency view and recognize the reality and working of financial markets placing primary focus on traditional types of financial institutions, upon which they design and implement relevant policies. We should pay attention also to its serious consequence.

Most basic information on finance including financial statistics have been collected through relevant "financial institutions", with which primary focus is placed on or limited to information related to traditional type of financial institutions, representatively banks. However, in relation to firm's financing behavior, the position and role of traditional financial institutions was not so prominent as had been assumed, and recently it has further decreased dramatically which I call the further increase in

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[24] On related issues associated with such expressions as "balance-sheet depression", "'zombie lending' and the long-term stagnation of the Japanese economy in the 1990s", and "'zombie companies' as a cause of long-term stagnation" see Miwa [2008, pp.163~66]. In association with the last expression, the government enthusiastically implemented "disposal of bad loans" policy. The title of Cabarello *et als* [2006], well-known with the expression of "zombie lending", is "Zombie Lending and Depressed Restructuring in Japan". This is an empirical study based on the theory that "[b]y keeping these unprofitable borrowers (that we call 'zombies') alive, the banks allowed them to distort competition throughout the rest of the economy"(p.3). This is not the place for its review, however.

[25] See Miwa [2010a] for the details of the reality, function, and roles of "credit guarantee" policy including the "Special Credit Guarantee Policy".

firm's "Independence from Banks". Naturally, it is necessary to review and restructure the present information collection scheme on various aspects including the span of objectives, the scope of information, and the allocation of focus and priority.

For instance, in discussing the influence on the Japanese economy of recent "financial crisis" and relevant policies, too much emphasis might have been placed on big financial institutions and their direct trade partners. Even if in Japan "the shadow-banking system" has not yet developed so remarkably as in the US and Europe, most Japanese firms obtain overwhelming portion of their funds from outside the "banking system", too.[26] Although unexplored yet, as shown below, in Japan recently including the period of "financial crisis", particularly in the 3rd quarter of FY2008, immediately after the Lehman Shock, the outstanding amount of receivables and payables has decreased dramatically in every size category of firms.

Money-supply indices, attention-grabbing in relation to macro monetary policy, are basically the aggregates of financial institution's deposit to the central bank and cash, or deposits as their liabilities. The primary reason of focus on those indices, at least in Japan, is the conventional wisdom, accepted as an obvious assumption, about the overwhelmingly important position and role of financial institutions, particularly banks, in the financial market. Once doubts on this assumption arise, it would be of great concern to review the role and appropriateness of those indices. It also would be important to investigate the mechanism and influence of the recent further increase in firm's "Independence from Banks", particularly in the 2000s under the long lasting "quantity easing monetary policy" on a magnificent scale.

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[26] Like "non-bank", the expression of "the shadow-banking system" also straightforwardly reflects the "bank centralism". For the expression of "the shadow-banking system", see Lo [2009]. Professor Lo is a prominent scholar in the field related to hedge funds, and this is a revised version of written testimony submitted to the U.S. House of Representatives Committee on Oversight and Government Reform for its November 13, 2008 Hearing on Hedge Funds and Systemic Risk. Many observers point out the defect of the traditional BIS-type regulation, micro-prudence regulation, that place primary focus on regulation of individual financial institutions, representatively banks. In response, it brings growing attention to regulations on a wider category of "financial institutions", macro-prudence regulation, with which the primary attention of regulators and the public is directed to ensure stability in the overall short-term financial market focusing on "liquidity" supply. Hostile sentiment and wariness of the public over "the shadow-banking system" including hedge funds sympathizes with it. Under such a situation, he boldly and interestingly argues that there is little connection between the recent "crisis" and the behavior of hedge-funds, and that it is the "shadow hedge fund system", in which financial institutions, like banks, insurance companies, and MMF, were engaged in hedge-fund-like investments and unprepared for the magnitude of losses in their portfolios caused by the U.S. residential real-estate market, who received the government's bailout efforts (p.13).

The "bank centralism", or the choice of placing too much emphasis on and favoritism on banks, in research and policy debates over the financial market must become an urgent issue for careful review.

Importance of financing measures other than borrowing from financial institutions

Firm's "Bank Dependence Ratio" has been lower than assumed by the conventional wisdom, and recently its "Independence from Banks" has further increased dramatically. As a result, the reality of financing measures other than borrowing from financial institutions and relationship between financing measures become a great concern.

In this research I begin the study along this direction, but only focusing on trade credit, that is, receivables and payables and organizing basic information about them. Recognizing that "we could proceed only to this extent, even with the best available firm-level data from CEQStat", new research programs would begin along this direction, I hope.

Study of recent events and evaluation of related policies

Comparing with the one until the 1980s, the financial market in postwar Japan since the burst of the "Bubble" has been roller-coaster and a series of close encounters with new unknown phenomena.

The dominant view (diagnosis) of the impacts of various events and enforcement of countermeasures (treatment) have been based on the conventional wisdom about the Japanese financial market established in the 1960s at the latest, which assumes as obvious the overwhelmingly important position and role of financial institutions, banks in particular, in the financial market. As this conventional wisdom is a myth which has fatally deviated from the reality, most of those diagnoses and treatments have had great possibilities of being in error. At least, we need a careful review.

The reality of "Credit Crunch" or "financial crisis" since the end of 1997, the influence of "financial crisis" since 2007, and the effectiveness and influence of ultraeasy credit policy under low-interest rate that has been maintained since the beginning of the 2000s are part of the issues for careful review. The same applies to the policy measures for the so-called "*jusen* problem".

[I&S-3]. Data and Variables

In this research I use firm-level data from the *Corporate Enterprise Quarterly Statistics* (CEQStat), with the exception of the parts on long-run trend where I use summary statistics from the *Corporate Enterprise Annual Statistics* (CEAStat). CEQStat classifies firms into 5 size categories, in the size of paid-in capital at the beginning of fiscal year. 5 categories are, 10~20, 20~50, 50~100, 100~1,000, respectively in million yen, and more than ¥1 billion. Hereafter, I use notation from 5 to 9, respectively, for each size category (v4), and often I use 6 figures (or tables), one for all firms and 5 for firms in each size category. CEQStat calls the firms in 3 smaller categories "small firms (literally, small and medium firms)", those in v4=8 "mid-sized", and those in v4=9 "big firms".

CEQStat is a sample survey, whose sample rates greatly differ across size categories. As a result, summary statistics over all the samples surveyed, depending on the sample rates and the sampling method, do not reflect the composition of population. CEQStat randomly samples approximately the following number of firms from each size category: v4=5, 4,000; v4=6, 4,000; v4=7, 2,000; v4=8, 10,000[27] ; and v4=9, all firms.

For instance, the situation of the survey in the 3rd quarter in FY2004 is as follows.

Situation of the Survey: 3rd Quarter of FY2004 (Oct.–Dec. in 2004)

Paid-in Capital (¥million)	10〜99	100〜999	1,000〜	total
Number of Firms Surveyed	9,630	9,930	5,761	25,321
Number of Respondents	6,584	8,129	5,333	20,046
Response rate（％）	68.4	81.9	92.6	79.2

With the exception of the category for the big firms (v4=9) where survey is a census, CEQStat is a sample survey in which the samples surveyed are all renewed at the beginning of each fiscal year, at the beginning of April. All the sample firms are requested to report over 4 quarters on items (primarily financial items) both at the beginning and the end of the quarter. Therefore, with the exception of v4=9, firms surveyed in different fiscal years are basically different. On most firms surveyed, data only on 5 data point, including the data at the beginning of the 1st quarter, are available.

In what follows I use notations like 200104, which stands for the 4th quarter of FY2001, that is, January~March 2002.

Basically in this research I use two types of variables, "level variables" and "difference variables". Suppose y^i_t stands for the outstanding amount of financial item i

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[27] In this category, actually all firms with more than ¥600 million in paid-in capital are surveyed.

at time t, short-term borrowings from financial institutions, for instance, and w_t the total assets. The first type of variables, level variables, l^i_t, is $y^i_{t-1}/w_{t-1}(*100)$, and the second one, d^i_t, is $(y^i_{t-1} - y^i_t)/w_{t-1}(*100)$.

Note that I use the ratios of financial items, typically "level variables", l^i_t, like the ratio of short-term borrowings to total assets ("short-term bank dependence ratio"), at the beginning of the quarter, and in this case the ratio at 200104 stands for the one at the end of the 3rd quarter in FY2001, at the end of December 2001, therefore, $l^i_t = y^i_{t-1}/w_{t-1}(*100)$. Also for "difference variables", d^i_t, the ratio at 200104 stands for the ratio of change in during the 4th quarter in FY2001 to the total assets at the beginning of the 4th quarter in FY2001, therefore, $d^i_t = (y^i_{t-1} - y^i_t)/w_{t-1}(*100)$.

What shown below is the list of variables.

List of Variables

	outstanding amount (at the end of the quarter) at time t	level variable dependence ratio composition ratio at time t	difference variable change in dependence ratio change in composition ratio at time t
short−term−bank−borrowing	y^1_t	$l^1_t=y^1_{t-1}/w_{t-1}$	$d^1_t=(y^1_{t-1}-y^1_t)/w_{t-1}$
long−term−bank−borrowing	y^2_t	$l^2_t=y^2_{t-1}/w_{t-1}$	$d^2_t=(y^2_{t-1}-y^2_t)/w_{t-1}$
deposit	y^3_t	$l^3_t=y^3_{t-1}/w_{t-1}$	$d^3_t=(y^3_{t-1}-3^1_t)/w_{t-1}$
receivable	y^4_t	$l^4_t=y^4_{t-1}/w_{t-1}$	$d^4_t=(y^4_{t-1}-y^4_t)/w_{t-1}$
payable	y^5_t	$l^5_t=y^5_t/w_{t-1}$	$d^5_t=(y^5_{t-1}-y^5_t)/w_{t-1}$
inventory	y^6_t	$l^6_t=y^6_{t-1}/w_{t-1}$	$d^6_t=(y^6_{t-1}-y^6_t)/w_{t-1}$
total bank borrowing	$y^7_t=y^1_t+y^2_t$	$l^7_t=y^7_t/w_{t-1}$	$d^7_t=(y^7_{t-1}-y^7_t)/w_{t-1}$
net−short−term−bank−borrowing	$y^8_t=y^1_t-y^3_t$	$l^8_t=y^8_{t-1}/w_{t-1}$	$d^8_t=(y^8_{t-1}-y^8_t)/w_{t-1}$
total asset	w_t		
v4: firm size category (=5, 6, 7, 8, 9)			
v18: short−term−bank−borrowing (=y^1_t)			

In CEStat, both CEQStat and CEAStat, classifies firms with the size of paid-in capital. For readers' convenience, I show below the average number of persons engaged in firms in each size category, first in all industries surveyed and then in manufacturing industry. Here I show the picture for the 3rd quarter in FY2004. Reader should note that, although it might be so serious for the main body of the research where I use firm-level data since FY1994, during the period since the 1960s over which I show an overview of long-run trends the correspondence between firm-size in paid-in capital and the one in the number of persons engaged has changed dramatically.

Here I follow the notations for firm size classification in CEQStat. 10~19 stands for ¥10 million~¥20 million.

All Industries					(unit: ¥million, number of persons)	
	total	10~19	20~49	50~99	100~999	1,000~
Number of Firms (N)	1,183,393	886,946	211,109	51,087	28,490	5,761
Number of Managers (M)	3,043,159	2,068,178	635,107	168,385	117,733	53,756
Number of Employees (L)	33,071,882	10,768,648	6,510,881	3,782,220	5,255,074	6,755,059
M+L	36,115,041	12,836,826	7,145,988	3,950,605	5,372,807	6,808,815
M/N	3	2	3	3	4	9
L/N	28	12	31	74	184	1,173
(M+L)/N	31	14	34	77	189	1,182

Manufacturing Industry					(unit: ¥million, number of persons)	
	total	10~19	20~49	50~99	100~999	1,000~
Number of Firms (N)	211,326	154,922	35,996	11,129	6,987	2,292
Number of Managers (M)	608,684	402,211	112,776	39,295	30,965	23,437
Number of Employees (L)	9,259,530	2,281,233	1,495,042	1,087,582	1,364,876	3,030,797
M+L	9,868,214	2,683,444	1,607,818	1,126,877	1,395,841	3,054,234
M/N	3	3	3	4	4	10
L/N	44	15	42	98	195	1,322
(M+L)/N	47	17	45	101	200	1,333

In what follows, together with the results on "all industries", for comparison frequently I refer also to the results on the "manufacturing industry".

Also, I show the results by size of firms. The composition of firms by size and by industry is shown below. Their composition ratios do not change by time drastically, but they are not rigidly fixed, either.

I show the picture of the 3rd quarter in FY2004, together with the one of the 1st quarter in FY1994 (the beginning quarter under study) and the one of the 2nd quarter of FY2009.

Sample Numbers Surveyed: by Firm Size, All Industries and Manufacturing Industry

	200403			199401			200902		
	A	B	B/A (%)	A	B	B/A (%)	A	B	B/A (%)
v4=5	1,882	537	28.5	2,374	695	29.3	1,786	462	25.9
v4=6	2,546	673	26.4	3,000	837	27.9	2,522	644	25.5
v4=7	2,148	785	36.5	1,715	754	44.0	2,076	763	36.8
V4=8	8,129	2,361	29.0	8,853	2,741	31.0	7,633	2,181	28.6
v4=9	5,333	2,185	41.0	4,679	2,033	43.4	4,966	2,004	40.4
Total	20,038	6,541	32.6	20,621	7,060	34.2	18,983	6,054	31.9

A：All Industries B：Manufacturing Industry

[I&S-4]. Simple Overview of DP1

In [I&S-4]~[I&S-7], respectively, I show a simple overview of 4 discussion papers that in total comprise the report of the research.

DP1 begins with pointing out that the conventional wisdom about the overwhelmingly important position and role of financial institutions, large banks in particular, in the Japanese financial market, that has been accepted as an obvious assumption for research and policy debates on financial phenomena, is a misconception and misunderstanding, a myth substantially deviating from the reality. DP2, as part of the results, concludes that there is no noteworthy phenomenon that should be judged as a clear sign of "credit Crunch" in Japan during 1997-1999. With those exceptions, this research is not for drawing conclusions on explicit problem setting.

CEStat, particularly CEQStat, provides extraordinary excellent statistical information about financing behavior of Japanese firms, small businesses in particular. In light of the situation of the conventional wisdom in research and policy debates on the Japanese financial market, it is too obvious that more focus should be placed on financing behavior of firms rather than on fund supplying behavior of financial institutions. However, this informative CEStat has rarely been used in research and policy debates on the Japanese financial market. As proactive and effective use of CEStat, including its firm-level data, is a way out of this confusion and unfortunate situation based on the misconception. This research is a critical review of the conventional wisdom and a trial for full-fledged organization of basic information about the financing behavior of Japanese firms, small businesses in particular.

As a consequence, particularly concerning DP2~DP4, I place more emphasis on Introduction and less on Summary.

Key content of DP1

The conventional wisdom about the overwhelmingly important position and role of the financial institutions in the financial market has been accepted as a basic assumption in research and policy debates over financial issues in Japan. DP1, entitled "The Low 'Bank-Dependence Ratio' and the Further Increase in the 'Independence of Firms from Banks'", undertakes a radical review of this conventional view and poses it a fundamental question. This basic assumption has been a misconception and a myth substantially deviating from the reality. This myth has been accepted as a basic assumption for several decades. I focus on this issue in DP1, because it is the most basic among the issues I investigate in this research, which also serves as a foundation of

discussion in DP2~DP4.

Number of zero-short-term-borrowing firms and its ratio to the total

Emphasizing the relationship with the "banks' reluctance to lend", first of all I focus here on firm's short-term borrowing from financial institutions. (DP1 also investigates firm's long-term borrowing and total borrowing, that is, the sum of short-term and long term borrowing.)

Here I show the figure for the smallest firm's group (v4=5) and the list of group averages (from [I-2-3]).
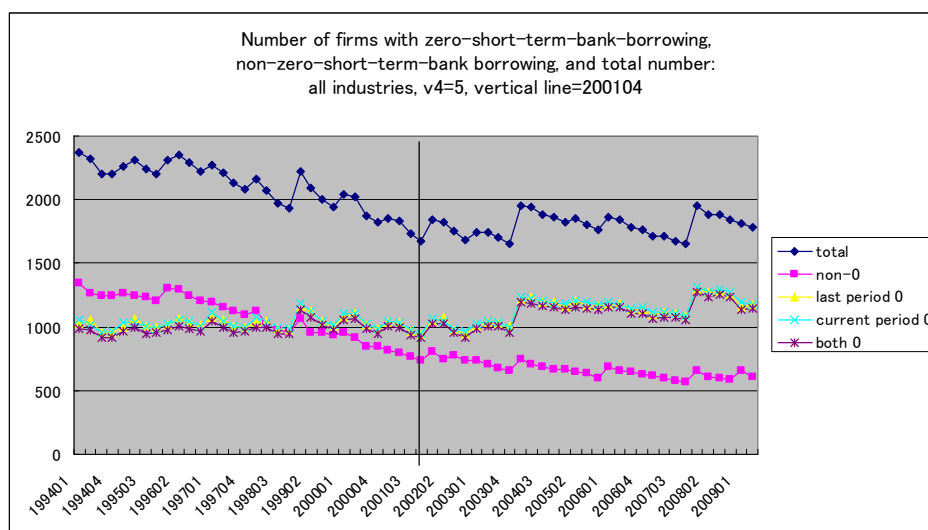
The figure shows the number of non-zero-short-term-borrowing firms (red) and zero-borrowing firms at the beginning of each quarter (yellow), zero-borrowing firms at the end (green), zero-borrowing firms both at the beginning and the end (purple), and all the firms surveyed (blue). For readers' convenience I insert a vertical line on 200104, at the mid-period.

(1) Three numbers of zero-borrowing firms, at the beginning, at the end, and at both points of time, are always almost the same. It implies that most firms with zero-borrowing at the beginning end the quarter with zero-borrowing.

(2) The ratio of non-zero-short-term-borrowing firms has consistently fallen during the study period, to the level of the half around FY1998, and to the 1/3 in FY2009.

Next is the list of group average of ratios, first for all firms and then for each size category. 0-0/T is the ratio of firms with zero-borrowing both at the beginning and end of the quarter to all the firms surveyed. I divide the survey period into two parts, until FY2001 and FY2002 and after, and show the average of ratios, as Average 1 and Average 2, respectively. Average T is for the whole period, and Av.1 – Av.2 is for their difference, that is, Average 1 – Average 2. It is the smallest firms' group (v4=5) where

those ratios are the highest (47.3, 61.5, 54.2) and the difference (Av.1 - Av.2) is the largest (-14.2).

Ratios of the number of firms with 0 short−term−bank borrowing both at the beginning and end of the quarter,
and of firms with zero-change in short-term-bank borrowing during the quarter: averages by period and their difference
All industries, by firm size, (unit=%)

	All firm sizes			v4=5			v4=6		
	nochange/T	0-0/T	0-0/nochange	nochange/T	0-0/T	0-0/nochange	nochange/T	0-0/T	0-0/nochange
Average 1	41.4	30.7	74.1	62.2	47.3	75.9	48.7	36.2	74.2
Average 2	53.1	42.4	79.8	75.0	61.5	82.0	60.4	47.7	78.9
Average T	47.1	36.4	76.8	68.4	54.2	78.9	54.4	41.8	76.5
Av.1 - Av.2	-11.7	-11.8	-5.8	-12.8	-14.2	-6.1	-11.7	-11.5	-4.7
	v4=7			v4=8			v4=9		
	nochange/T	0-0/T	0-0/nochange	nochange/T	0-0/T	0-0/nochange	nochange/T	0-0/T	0-0/nochange
Average 1	43.9	32.8	74.8	39.9	29.8	74.7	30.7	21.7	70.8
Average 2	56.1	44.7	79.7	52.2	42.7	81.7	42.3	32.0	75.7
Average T	49.8	38.6	77.2	45.9	36.1	78.1	36.3	26.7	73.2
Av.1 - Av.2	-12.2	-11.9	-4.9	-12.4	-12.9	-7.0	-11.6	-10.3	-5.0

Short-term bank dependence ratio

From the cumulative distribution of firm's "short-term bank dependence ratio", the ratio of short-term-borrowing to total assets at the beginning of each quarter, I show the transition of p10, p25, p50, p75, p90 (p stands for percentile) in the following 3 figures, for all firms, for firms in v4=5, and v4=8.

short−term loan share (level), all industries, all size, vertical line=200104

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short-term loan share(level), all industries, v4=5, vertical line=200104

short-term loan share (level), all industries, v4=8, vertical line=200104
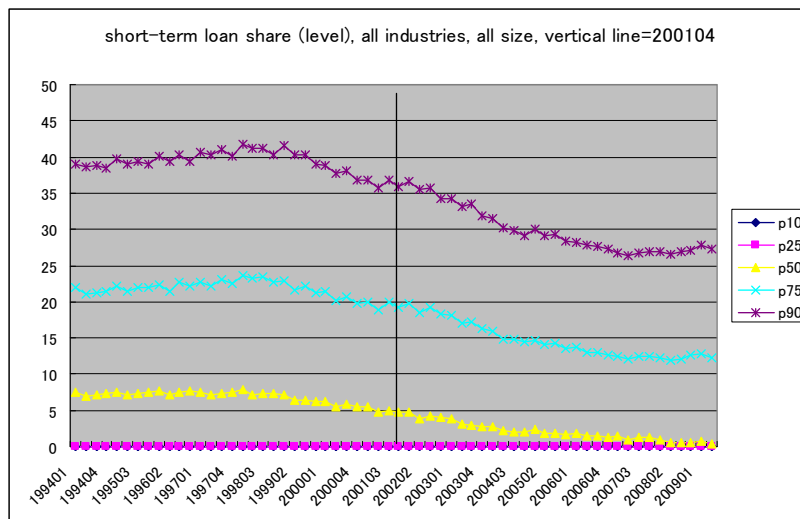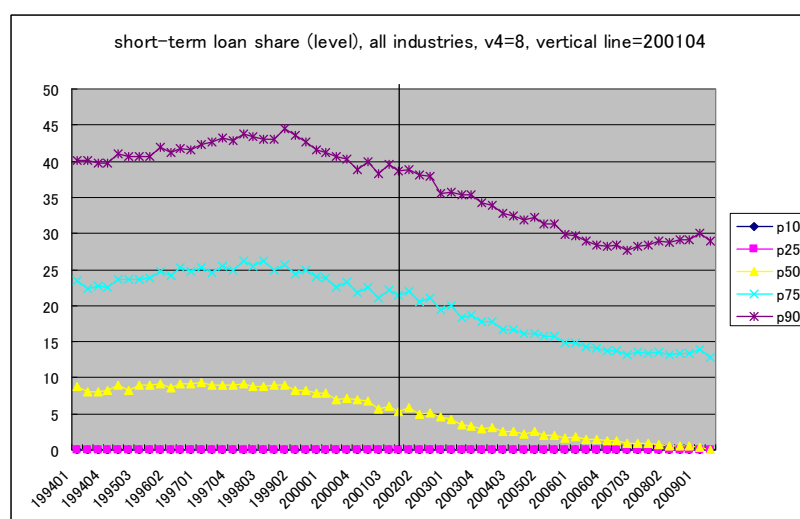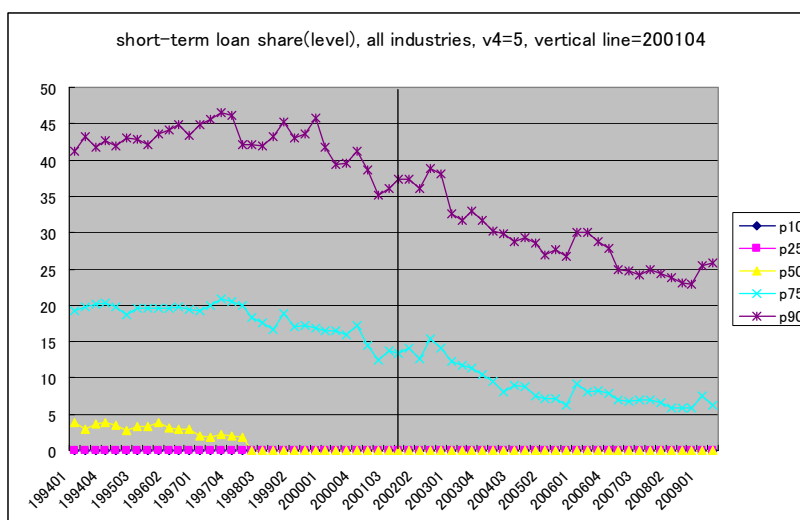
Next table shows the period averages of those percentile values, first for all firms and then for each size category. In every size category, the short-term bank dependence ratios of non-zero-short-term-borrowing firms fell during the study period.

Distribution of short–term–bank–borrowing ratio (I^1_t): unit=% all industries, by size

		p10	p25	p50	p75	p90
all firm szies	Average 1	0.00	0.00	6.79	21.67	39.25
	Average 2	0.00	0.00	2.03	14.57	29.76
	Average T	0.00	0.00	4.49	18.23	34.66
	Av.1 − Av.2	0.00	0.00	4.76	7.11	9.49
v4=5	Average 1	0.00	0.00	1.56	18.09	42.31
	Average 2	0.00	0.00	0.00	8.82	28.96
	Average T	0.00	0.00	0.80	13.60	35.85
	Av.1 − Av.2	0.00	0.00	1.56	9.26	13.36
v4=6	Average 1	0.00	0.00	5.29	20.50	39.87
	Average 2	0.00	0.00	0.72	14.32	31.34
	Average T	0.00	0.00	3.08	17.51	35.74
	Av.1 − Av.2	0.00	0.00	4.57	6.18	8.52
v4=7	Average 1	0.00	0.00	6.17	20.97	38.70
	Average 2	0.00	0.00	1.56	15.03	31.27
	Average T	0.00	0.00	3.94	18.10	35.10
	Av.1 − Av.2	0.00	0.00	4.61	5.94	7.43
v4=8	Average 1	0.00	0.00	8.19	23.92	41.35
	Average 2	0.00	0.00	2.20	15.94	31.65
	Average T	0.00	0.00	5.29	20.06	36.66
	Av.1 − Av.2	0.00	0.00	5.99	7.98	9.70
v4=9	Average 1	0.00	0.29	7.56	20.13	34.81
	Average 2	0.00	0.00	3.84	14.09	26.10
	Average T	0.00	0.15	5.76	17.21	30.59
	Av.1 − Av.2	0.00	0.29	3.71	6.05	8.71

Total bank dependence ratio

Concerning "total borrowing" (= short-term borrowing + long-term borrowing), I show the figure on the transition of bank dependence ratio for the smallest firms (v4=5) and the summary table corresponding to the one shown above (from [I-2-5]). What shown above is not peculiar to short-term bank dependence ratios, that is, to short-term borrowing.

short+long term loan share (level), all industries, v4=5, vertical line=200104
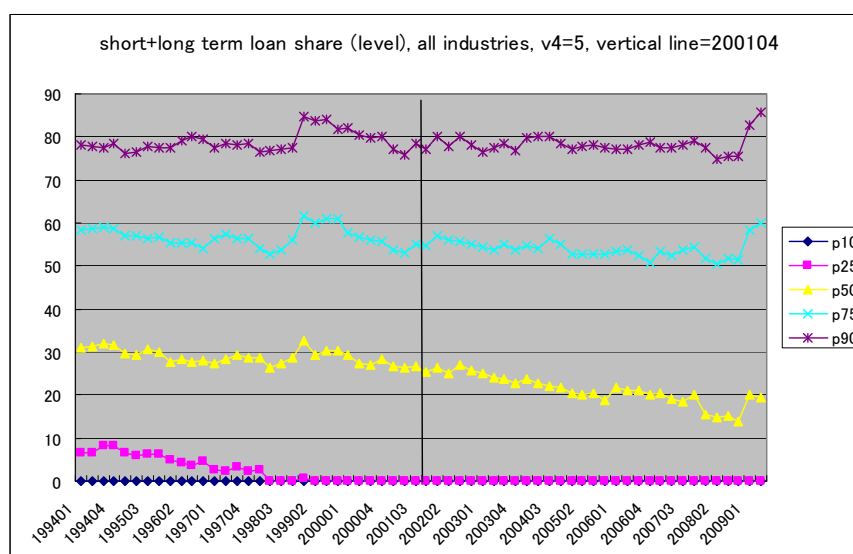
Distribution of total-bank-borrowing ratio (l^7_t): unit=% all industries, by size

		p10	p25	p50	p75	p90
All firm sizes	Average 1	0.00	2.88	25.81	51.06	73.03
	Average 2	0.00	0.00	14.64	40.47	63.04
	Average T	0.00	1.49	20.41	45.94	68.20
	Av.1 – Av.2	0.00	2.88	11.17	10.59	9.98
v4=5	Average 1	0.00	2.69	28.79	56.60	78.79
	Average 2	0.00	0.00	21.00	54.01	78.31
	Average T	0.00	1.39	25.02	55.35	78.56
	Av.1 – Av.2	0.00	2.69	7.78	2.59	0.48
v4=6	Average 1	0.00	7.87	32.56	56.52	75.91
	Average 2	0.00	0.35	26.19	52.97	73.55
	Average T	0.00	4.23	29.48	54.80	74.77
	Av.1 – Av.2	0.00	7.52	6.37	3.54	2.37
v4=7	Average 1	0.00	5.28	32.26	56.10	76.42
	Average 2	0.00	0.00	23.52	51.04	71.06
	Average T	0.00	2.73	28.03	53.65	73.82
	Av.1 – Av.2	0.00	5.28	8.74	5.06	5.36
v4=8	Average 1	0.00	1.85	26.19	51.63	73.47
	Average 2	0.00	0.00	11.72	38.12	59.36
	Average T	0.00	0.95	19.19	45.10	66.64
	Av.1 – Av.2	0.00	1.85	14.47	13.51	14.12
v4=9	Average 1	0.00	2.68	19.51	41.87	65.12
	Average 2	0.00	0.00	11.03	30.19	48.55
	Average T	0.00	1.39	15.40	36.22	57.10
	Av.1 – Av.2	0.00	2.68	8.48	11.68	16.56

Everywhere, in smaller firms' categories in particular, there are rather a small group of firms with extreme high total bank dependence ratio. For instance, the p90 value for v4=5 remains at the level of almost 80%, which however says that only 10% of firms in this category borrow more than 80% of their funds. In the second half-period, the p25 value is 0 almost everywhere, and in the categories of v4=7~v4=9 Av.1 – Av.2

remarkably fell everywhere.

Net short-term bank dependence ratio

Bank borrowing, including short-term bank borrowing, is a part of firm-bank trade relationship. In this light DP1 ([I-5]~[I-6]) focuses on deposit (and cash). During the study period, although "Bank Dependence Ratios" remarkably fell, the ratio of deposit to total assets remained at the same level, or rather moved upwards ([I-4]).

Firms hold deposit for various purposes, and in DP1 I focus on deposit from various perspectives. If a reader pays particular attention to short-term confusion in financial market such as "credit crunch", "financial panic", or drastic tightening, he will recognize deposit as a buffer for them and be interested in the level and movement of the net short-term bank dependence ratio, that is (short-term bank borrowing minus deposit)/total assets.

Here I introduce part of the results on this new short-term bank dependence ratio. I show the figure on the transition of net short-term bank dependence ratio for the smallest firms (v4=5) and the summary table corresponding to the one shown above (from [I-5-2]).

net bank st-loan dependence, all industries, v4=5, vertical line 200104
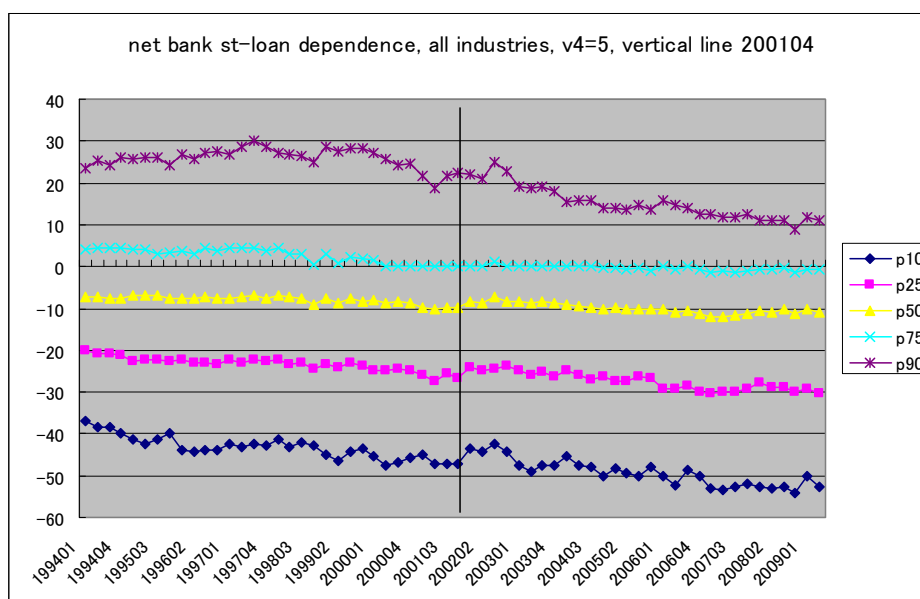
The p75 value has consistently stayed at the level of 0%, which means that only 25% of firms in this size category hold short-term borrowing larger than their bank deposit. The p90 value is at the level of 10% recently.

Following summary table shows that what shown above is not peculiar to firms in v4=5. Also by net short-term bank dependence ratio, firms' "Bank Dependence Ratio" has not be so high as the conventional wisdom has argued, and recently their

"Independence from Banks" has further increased remarkably.

Distribution of net-short-term-bank-borrowing ratio (I^8_t): unit=%   all industries, by size

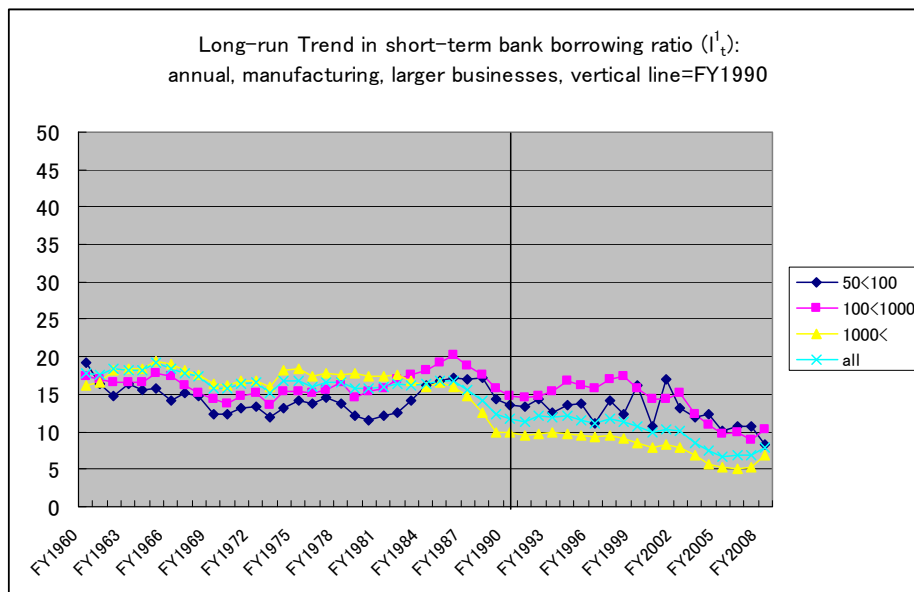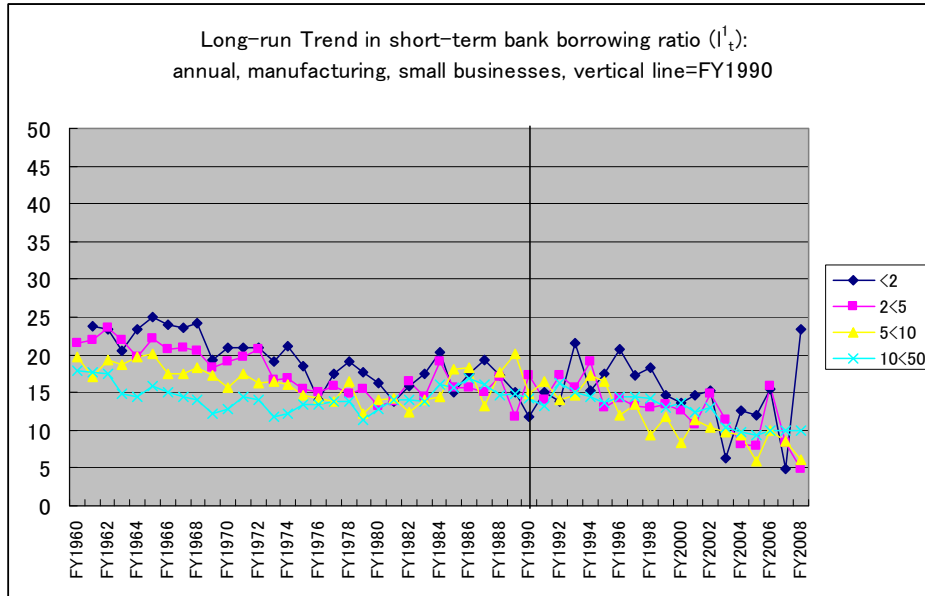|		p10	p25	p50	p75	p90
all firm sizes	Average 1	−27.45	−11.49	−0.98	12.34	30.39
	Average 2	−34.02	−15.55	−3.05	5.56	21.51
	Average T	−30.63	−13.45	−1.99	9.06	26.09
	Av.1 − Av.2	6.57	4.06	2.07	6.77	8.89
v4=5	Average 1	−43.28	−23.32	−7.93	2.64	25.83
	Average 2	−49.31	−27.45	−9.97	−0.40	15.10
	Average T	−46.20	−25.32	−8.92	1.17	20.63
	Av.1 − Av.2	6.02	4.13	2.03	3.04	10.73
v4=6	Average 1	−36.16	−18.74	−5.40	5.74	24.68
	Average 2	−43.33	−23.52	−8.14	1.19	17.89
	Average T	−39.63	−21.05	−6.72	3.54	21.39
	Av.1 − Av.2	7.17	4.79	2.73	4.55	6.78
v4=7	Average 1	−29.09	−13.36	−2.54	9.08	27.27
	Average 2	−35.81	−17.73	−4.73	3.60	21.02
	Average T	−32.34	−15.48	−3.60	6.43	24.24
	Av.1 − Av.2	6.71	4.37	2.19	5.48	6.25
v4=8	Average 1	−23.39	−8.65	0.00	15.34	33.58
	Average 2	−32.82	−14.25	−2.29	6.75	23.86
	Average T	−27.95	−11.36	−1.11	11.18	28.88
	Av.1 − Av.2	9.42	5.60	2.30	8.59	9.73
v4=9	Average 1	−18.98	−7.24	0.72	14.02	29.55
	Average 2	−22.21	−9.43	−0.79	8.12	20.89
	Average T	−20.54	−8.30	−0.01	11.16	25.36
	Av.1 − Av.2	3.23	2.18	1.51	5.90	8.66

Long-run trend

In [I-7], using summary statistics from CEAStat, I show the long-run trend of key financial variables ("level variables") since FY1960. Here I introduce part of the results first on the short-term bank dependence ratio by size and in the manufacturing sector ([I-7-2]). Note that size category in CEAStat is slightly different from that in CEQStat. The unit is million yen, therefore "<2" stands for "less than ¥2 million in paid-in capital".

For instance, for firms in 10<50 that corresponds the CEQStat's v4=5 and 6, the ratio (in blue) started with the level below 20% and until very recently around 15% level, which has not been remarkably different from that of bigger firms. As the long-run bank dependence ratio in the 1970s were below 20% everywhere ([I-7-3], now shown here), total bank dependence ratio was not so high as the conventional wisdom argues.

Long-run Trend in short-term bank borrowing ratio (I^1_t): annual, manufacturing, small businesses, vertical line=FY1990

Long-run Trend in short-term bank borrowing ratio (I^1_t): annual, manufacturing, larger businesses, vertical line=FY1990

Next, I show one of the most impressive results, the ratio of receivables to total assets, "receivable dependence ratio". Here the results are on all industries ([I-7-6-1]) .

In the 1960s and 1970s this ratios were at the level of 30% everywhere, which were higher than the short-term bank dependence ratios. In the 2000s firms in 10<50 is slightly above 15%, approximately the half of the 1960s level, which is lower than that of larger firms.

Long-run Trend in Receivable Dependence Ratio (I^1_t): annual, all industries, small businesses, vertical line=FY1990

Long-run Trend in Receivable Dependence Ratio(I^1_t): annual, all industries, larger businesses, vertical line=FY1990
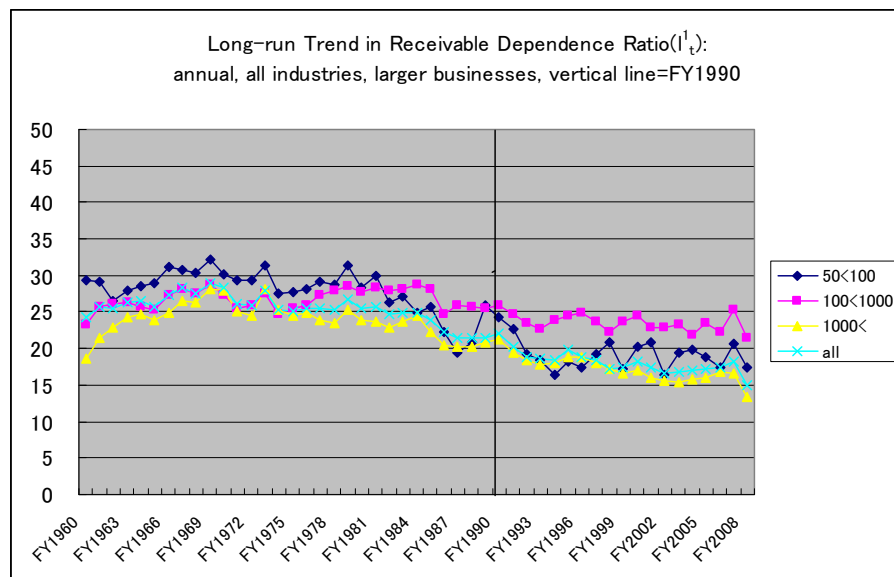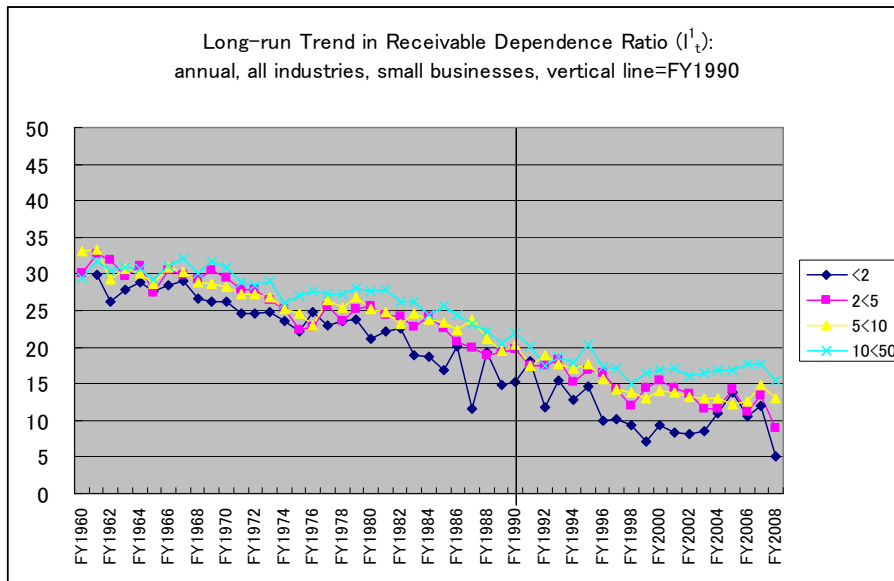
This is the receivable dependence ratio, rather than the payable dependence ratio. In the 1960s, the hay day of the "dual structure" theory, large firms with advantageous position in the market supplied (relent) to smaller firms as trade credit, the conventional wisdom argues. Their receivable dependence ratio, however, was at almost the same level as the one of small businesses. It is small businesses rather than large firms that decreased this dependence ratio remarkably, through the process of "liberalization" and development in financial market.

[I&S-5]. Simple Overview of DP2

In DP2, entitled "The Reality of Short-term Shocks like the 'Credit Crunch' of 1997-1999 and the 'Financial Crisis' of 2007, and the Effectiveness of 'Emergency' Economic Measures – A Follow-up to Miwa [2008]", as a follow-up to Miwa [2008] I investigate the reality of the "Credit Crunch" of 1997-1999 in a wider perspective. Also, I study the influence both of various "emergency economic measures" adopted as countermeasures and of the ultra-easy credit policy that has lasted after the "Crunch". I also focus on the influence of the recent "financial crisis" of 2007.

Miwa [2008] focused on firms with larger than ¥600 million in paid-in capital. Because of this circumscription, there remains a strong interest in a question: "Did the same conclusion applied also to smaller firms with less than ¥600 million in paid-in capital? Was the situation different?" Some seem to be frustrated, arguing: "It was credit crunch or banks' reluctance to lend to small businesses that was serious during that period, and it is off target like this study to focus only on large companies."

This research project began with a question: "Did the same conclusion apply also to smaller firms with less than ¥600 million in paid-in capital? Was the situation different?" As all the firms surveyed are replaced every fiscal year, we cannot conduct completely the same investigation in this study as in Miwa [2008].

In this research, I place more focus on small businesses than on large firms. It was easy to forecast that the conclusion of Miwa [2008] would apply also to small businesses (and it does). Upon the conclusion of DP1 that the conventional wisdom about the overwhelmingly important position and role of the financial institutions in the Japanese financial market is a myth substantially deviating from the reality, we have to change the direction of our focus of study on firm's financing behavior only from borrowing from financial institutions to other balance-sheet items, other financing measures in particular, like deposits, receivables, payables, and inventory, and their mutual relations. As a consequence, in this research, more focus is placed on financing behavior of small businesses, expanding the examination point to other items than bank borrowings.

The study period of this research is 15 and half years, from FY1994 to the 2nd quarter of FY2009. The global financial market has radically changed particularly since the second half of the 1990s, and this change is one of the causes of the recent financial crisis since 2007, argue many observers. In relation particularly to the upheaval and chaos after the "Lehman Shock" of September 2008, we have witnessed an increasing worldwide attention to the reality of Japan's "Lost Two Decades", including the "Credit

Crunch" in 1997-1999, and the details of related government policies and their effectiveness. Many Japanese, particularly those who were in and around the government, argue that policies worked effectively from which we should draw policy lessons positively, and others, mostly those outside Japan, argue that we should learn much from the Japanese experience not to follow the path of Japan.

As shown in DP1, like in Miwa [2008], during 1997-1999 we find no noteworthy observation about firms in any size category that should be regarded as a sign of serious "Credit Crunch". In addition, extending the study period, we explore the recent "financial crisis" of 2007, and draw almost the same conclusion. Moreover, we study also the influence of ultra-easy credit policy that has lasted after the "Crunch".

Influence of and countermeasure to the situation that there were so many zero-short-term-bank-borrowing firms

Particularly in smaller firm groups there were so many zero-short-term-bank-borrowing firms, whose ratio further increased during the study period. Most firms with zero-short-term-bank-borrowing at the beginning of the quarter remain the same at the end. Under such a situation, where the ratio of those firms is more than a half, the basic measure of this study, also adopted in Miwa [2008], to focus on the distribution of short-term-bank-borrowing "difference variable", the ratio of change in short-term-borrowing during the quarter to total assets at the beginning, might face serious troubles. In addition, there must be non-zero-short-term-borrowing firms with 0 change simply because of borrowing period longer than a quarter.

The first table introduced at the beginning of previous section, the list of group averages of ratios…, shows also nonchange/T and 0-0/nonchange. The former is the ratio of the number of firms with non-change to all firms, and the latter is the ratio of firms with zero-short-term-borrowing both at the beginning and the end to the number of non-change firms. In the smallest group firms (in v4=5), for instance, in the second half period, the former was 75%, and the latter was 82%. Then, such a dominance of 0-0 firms might seriously affect the studies with short-term-bank-borrowing "difference variable".

If, for example, we draw a conclusion: "There were few small businesses which were obliged to reduce and actually reduced borrowings from financial institutions even during the 'Credit Crunch' period", we have to prepare ourselves to accept a criticism: "It might be a false illusion that come up with a dominance of information about the firms that had completed their 'Independence from Banks' over that about firms with non-zero-bank-borrowing. Cleaning up such a noise, we have to focus on firms that

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needed to borrow from financial institutions".

As shown in the next figure, ratio of non-zero-short-term-bank borrowing firms was lower in smaller firm group. It drastically fell in every group during the study period.

Nonetheless, by focusing only on firms with more than ¥600 million in paid-in capital and limiting the study period to FY1994~FY2000, fortunately, its influence to the conclusion of Miwa [2008] seems to be relatively minor.
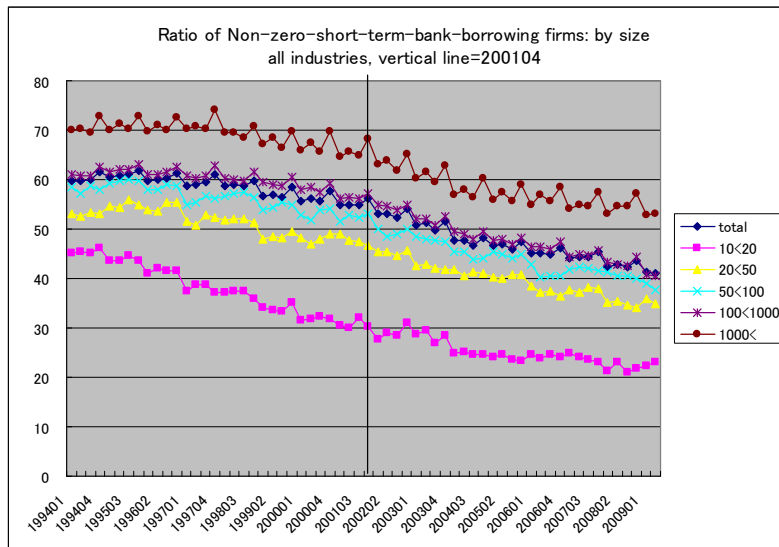
Next figure shows the transition of p10, p25, p50, p75, p90 values of the distribution of short-term-bank-borrowing "difference variable". Actually, most probably due primarily to the influence in the ratio of non-change firms, the distribution seems to be rapidly concentrating around 0 value, like "collapsing" from both sides. This figure is about all the firms in all industries.

Disribution of changes in short-term bank borrowing ratio (d^1_t):
quarterly, all industries, all firm sizes, vertical line=200104
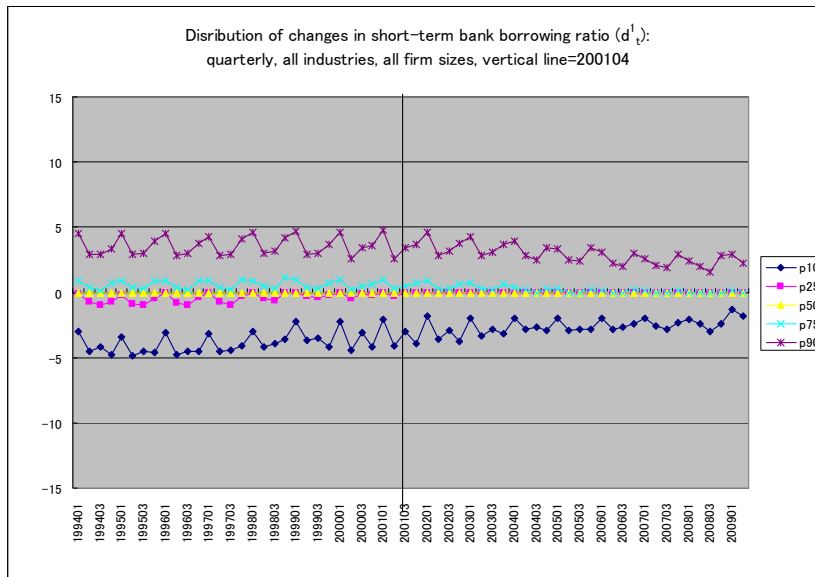
I tried two countermeasures: the first is to exclude firms with zero-short-term-borrowing at the beginning of the quarter (Modified Sample 1); and the second is to exclude firms with non-change in short-term-borrowing (Modified Sample 2). Confirming that those two countermeasures draw similar results, mostly in this research I take the first one (Modified Sample 1).

"Credit Crunch"?: a follow-up of Miwa [2008]

Next figure shows the distribution of short-term-bank-borrowing "difference variable" for firms in v4=5, with Modified Sample 1 ([II-3-1]).

Distribution of changes in short-term bank borrowing ratio (d^1_t):
quarterly, v4=5, modified sample 1, vertical line=200104
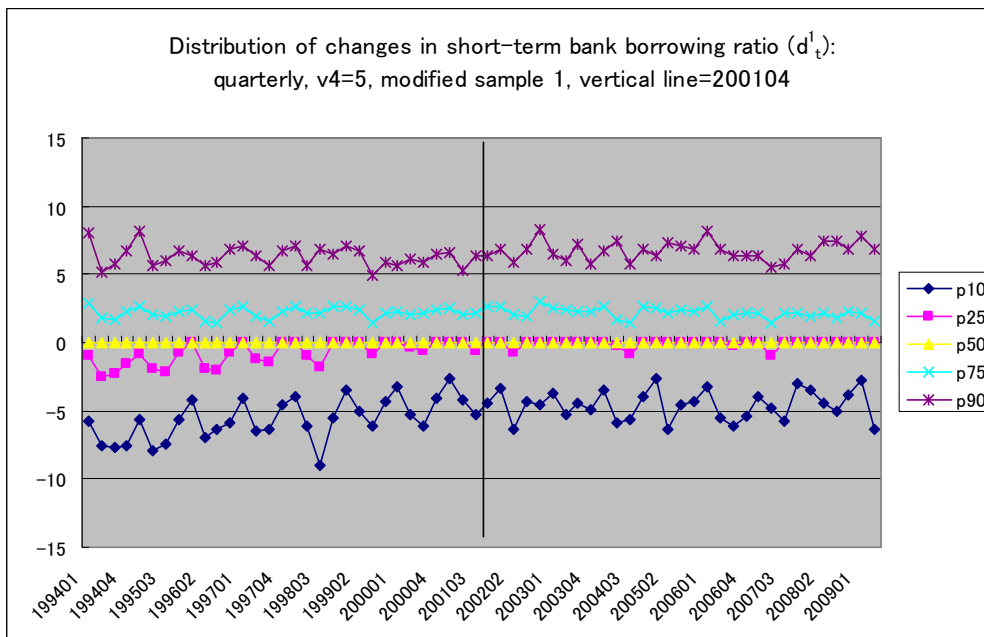
What is prominent here is the shift of distribution in the 3rd quarter of FY1998, suggesting a drastic increase in small firm's borrowing, which is most probably a consequence of temporary explosion of their borrowing stimulated by "the Special Credit Guarantee Policy" for small businesses that began in October 1998 and ended in March 2001.

Next is the corresponding figure for v4=8. As the "Policy" was for small businesses, there is no such a drastic shift in 199803.[28] (Hereafter, often I show figures for V4=5 and 8, the former for representative of small businesses and the latter for larger firms.)

Disribution of changes in short-term bank borrowing ratio (d^1_t): quarterly, v4=8, modified sample 1, vertical line=200104
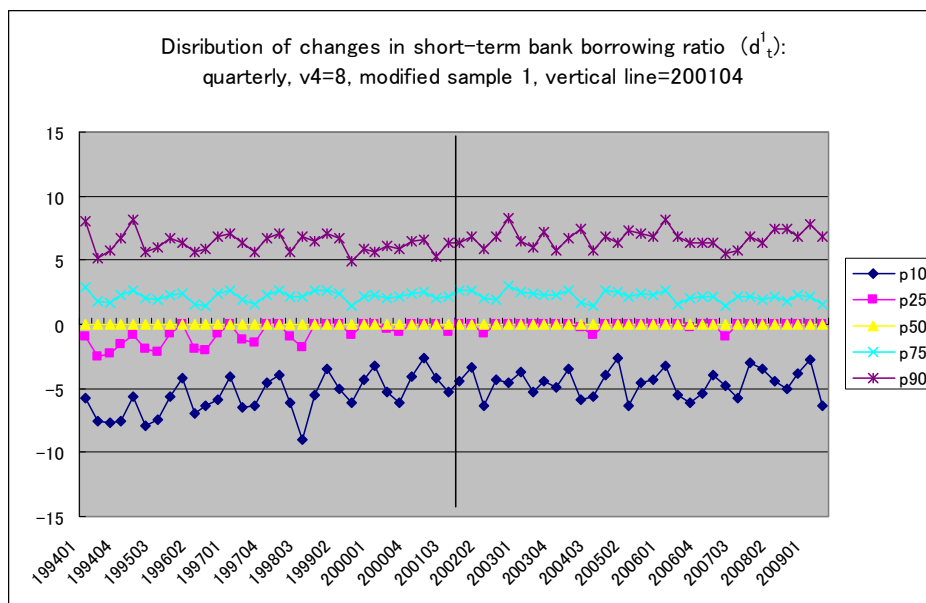
With the exception of this temporary movement, there is no noteworthy observation that suggests an occurrence of serious "credit crunch".

Distribution of level variables:

The ratio of receivables, payables, or inventory to total assets

From the second half of DP2 to DP4, I expand the examination items from transaction items with financial institutions like borrowing and deposit to a wider variety of balance-sheet items. The major focus is placed on receivables and payables, and also inventory often alleged to be closely connected with them. [II-6] and [II-7] focus

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[28] Under this policy scheme, it was profitable to borrow in long-term, 5 to 7 years. The shift of distribution is more prominent in corresponding figures on long-tem borrowing, shown in [II-4-1] and [II-5-2]. The shift is clearly observed in figures both for v4=5 and 6, nothing for v4=8 and v4=9, and a slight shift for v4=9, for firms with ¥50~¥100 million in paid-in capital.

on the level variables, the ratio of receivables, payables, or inventory to total assets, and [II-8]~[II-11] on the difference variables, the ratio of change in deposits, receivables, payables, or inventory to total variables.

The primary purpose of the second half of DP2 is to organize the basic information. For illustration, I introduce here, for v4=5 and 8, the distribution of the ratio of payable to total asset, that is (might be) close substitute for bank borrowing ([II-6-2])。

payables share, v4=5, vertical line 200104

payables share, v4=8, vertical line 200104
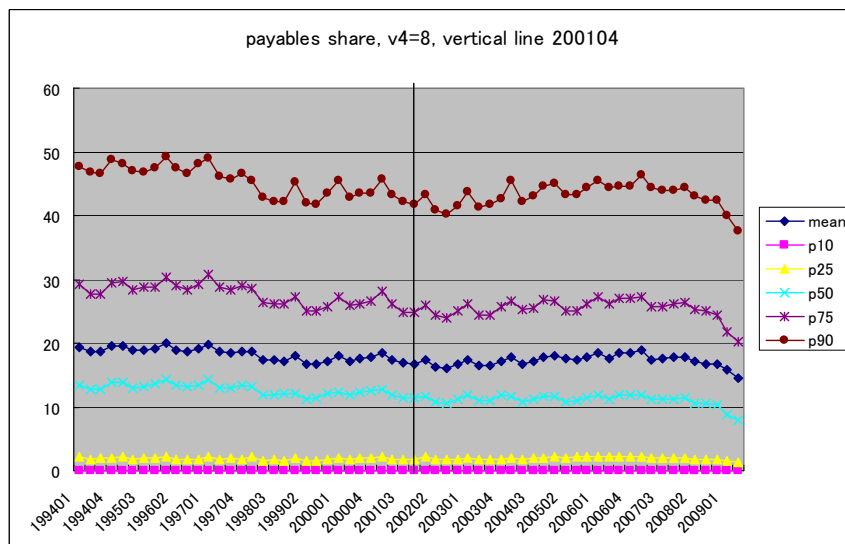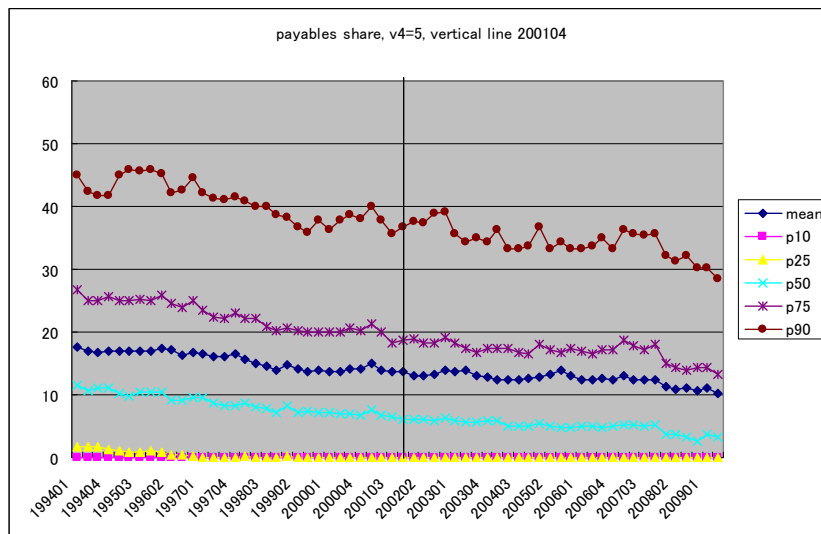
In either class the ratio has been widely distributed, and it has been consistently higher in v4=5 than in v4=8. What those figures show is far from the schematic unilateral relation in the conventional wisdom that small business has obtained credit from large firms through payables.

Rapid decrease in the payable/(total asset) ratio during the recent "financial

crisis", not during the former "Credit Crunch", is prominent. The same applies also to the receivable/(total asset) ratio ([II-6-1]). The reason and mechanism are unexplored, yet.

The ratio of inventory to total asset has been consistently much lower than either the receivable/(total asset) ratio or the payable/(total asset) ratio. In addition, unlike the latter two ratios, during the recent "financial crisis", the inventory/(total asset) ratio has not decreased ([II-7]). The conventional wisdom that trade credit has been used for inventory finance will be under pressure for reevaluation.

What shown above holds with little modification when I limit the examination to the manufacturing industry.

Distribution of difference variables

In [II-8]~[II-11], I examine the distribution of difference variables, the ratio of change in deposits, receivables, payables, or inventory to total assets, respectively.

For illustration, I introduce here, for v4=5 and 8, the distribution of the ratio of change in payable to total asset ([II-10-1]).

Distribution of changes in payable ratio (d^5_t):
All industries, quarterly, v4=8, vertical line=200104
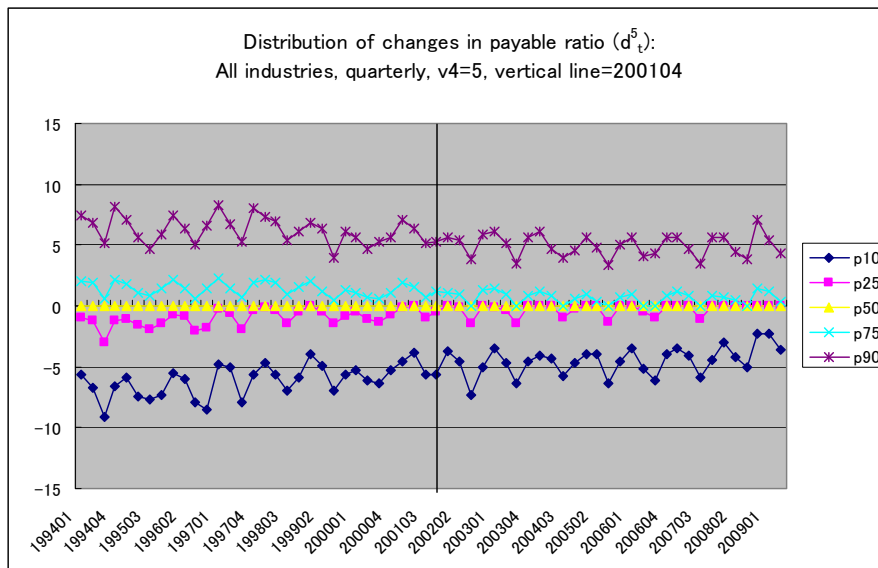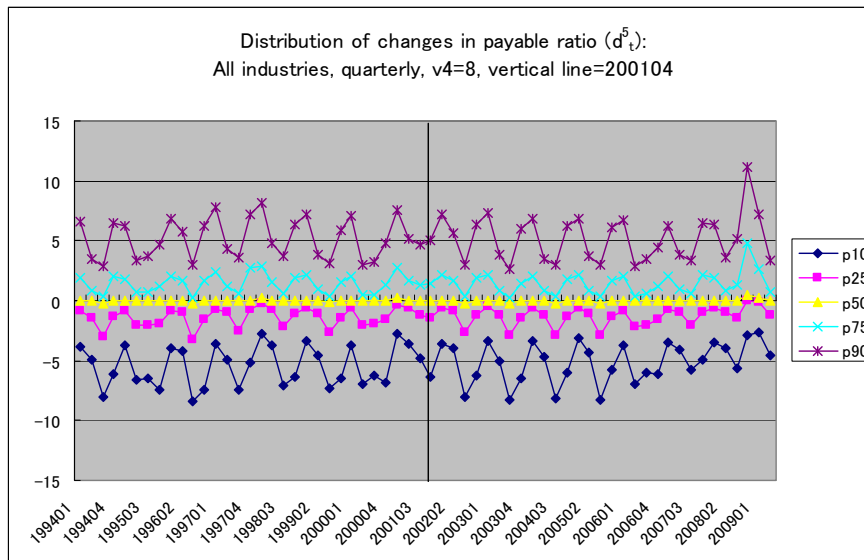
In either class the ratio has been widely distributed. Nowhere I find a prominent movement of the distribution of change in payable dependence ratio, for instance, in that of small businesses during the "Credit Crunch" or at the 3rd quarter of FY1998.

The distribution of change in inventory dependence ratio, the ratio of change in inventory to outstanding total asset, shows that its movement is by far smaller than that of receivables or payables. The close relationship between inventory and trade credit, that is, receivables and payables, that the conventional wisdom takes it obvious and for granted, is unclear (for the details see DP4). The conventional wisdom that trade credit has been used for inventory finance will be under pressure for reevaluation.

The conclusion of Miwa [2008], focusing on the movement of the ratio of change in short-term bank borrowing to total asset, that we find no clear sign of serious "credit crunch" applies also to the situations where we focus on other financial variables like receivables, payables, and inventory and expand our examination to small businesses.

Dramatic decrease in the difference variable in payables, particularly for v4=8, in the 3rd quarter of FY2008, immediately after the Lehman Shock is prominent.

What shown above holds with little modification when I limit the examination to the manufacturing industry.

[I&S-6]. Simple Overview of DP3

Based on the results of DP1 and DP2, DP3, entitled "The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (1) Overall Discussion and Preliminary Investigation", together with DP4, focuses on "trade credit" like receivable and payable. In DP3 and DP4, as the first step to investigate the reality of firm's behavior on financing and asset choice I see balance-sheet items other than "capital" and borrowing from financial institutions, of which DP3 is the first half.

For several decades the conventional wisdom about the overwhelmingly important position and role of financial institutions, big banks in particular, and the decisive significance of borrowing from financial institutions as firm's financing measure has been dominant. Reflecting such a situation, interest on other financing measures including trade credit has been extremely weak. Consequently, the conventional wisdom primarily based on sketchy report or story of "expert's" personal experience, neither with quantitative data nor rough size estimates, has become the dominant view. In view of such a situation, as a basic work for investigating the reality of firm's behavior in choosing financing related variables including borrowing from financial institutions, DP3 and DP4 organize relevant basic information, focusing on receivable, payable and inventory.

DP3 first organizes information about the reality of trade credit and its long-run trends ([III-2]), and next discusses generally the interrelationship among trade credit, borrowing from financial institutions, and inventory ([III-3]). In [III-4]~[III-7], as the first step of investigating the relationships among relevant variables I compare the two groups of firms, firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (type A) and firms with zero-borrowing (type B). It is based on the expectation that there is an essential difference between two types of firms, which is revealed in firm's choice, so that through comparison we will obtain useful information and hints for future research on the decision mechanism on short-term bank borrowing and the causality in making decisions concerning financial variables.

In DP4, by studying correlation coefficients among financial variables and through multiple regressions I examine the relationships among those choice variables. The first half, [IV-2]~[IV-3], is for studying correlation coefficients, upon which the second half, [IV-4]~[IV-5], is for multiple regressions.

The reality of trade credit and its long-run trends

The conventional wisdom about the overwhelmingly important position and

role of financial institutions of the traditional types, big banks in particular, in the financial markets, which I call "bank-centralism", has been dominant not only in Japan but also in the world. As a result, almost everywhere trade credit has never been much emphasized, and most people, including researchers and persons in charge of policies, have lacked interest in its role and function. Particularly in Japan, under the schematic interpretation or preoccupation based on the "dual structure" theory, interest on the reality of trade credit and related transaction has remained on the shelf.

[III-2], entitled "The Reality of Trade Credit and its Lon-run Trends", using summary statistics from CEAStat, examines the schematic interpretation based on the "dual structure" theory, comparing with the reality of long-run trends in trade credit. Comparing with the figures on long-run trends in receivable dependence ratio shown in [I-7], discussion proceeds with long-run trends in payable- and inventory dependence ratio.

For the details I ask readers to refer to DP3. Here I introduce two impressive figures on long-run trends in payable dependence ratio, and then corresponding two figures on inventory dependence ratio, all for all industries.

I start with figures on payable dependence ratio ([III-2-2-]).

Long-run Trend in Payable Dependent Ratio(I^I_t): annual, all industries, small businesses, vertical line=FY1990

Long-run Trend in Payable Dependence Ratio(I^1_t):
annual, all industries, larger businesses, vertical line=FY1990
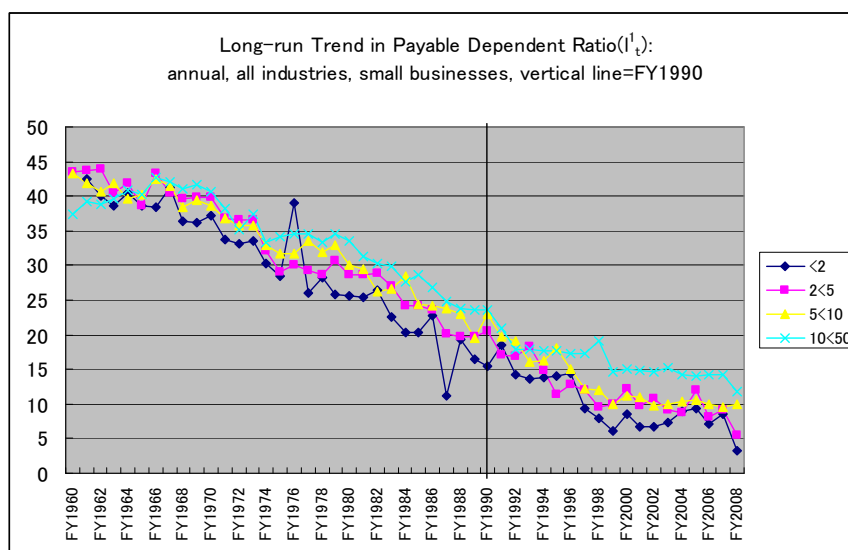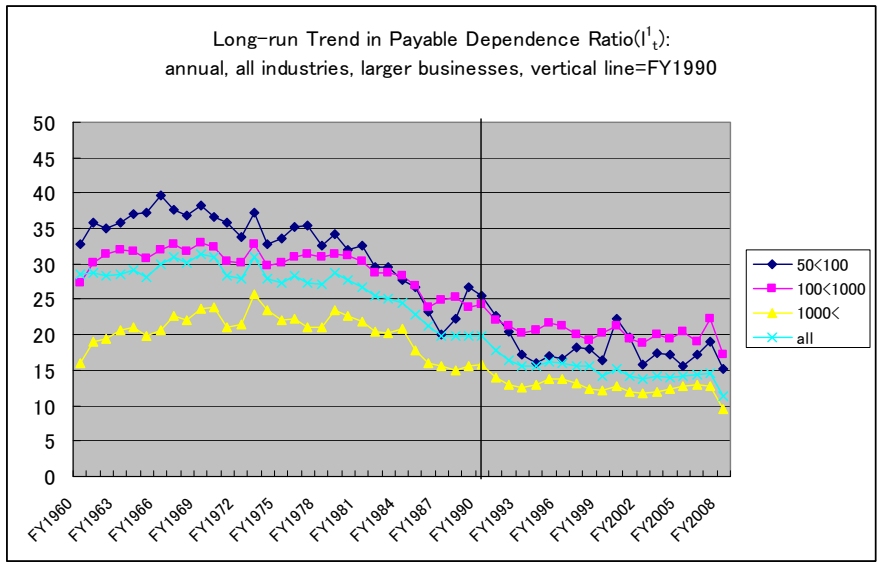
Then, two figures on inventory dependence ratios ([III-2-3]).

Long-run Trend in Inventory Dependent Ratio(I^1_t):
annual, all industries, small businesses, vertical line=FY1990

Long-run Trend in Payable Dependence Ratio(I1t):
annual, all industries, larger businesses, vertical line=FY1990
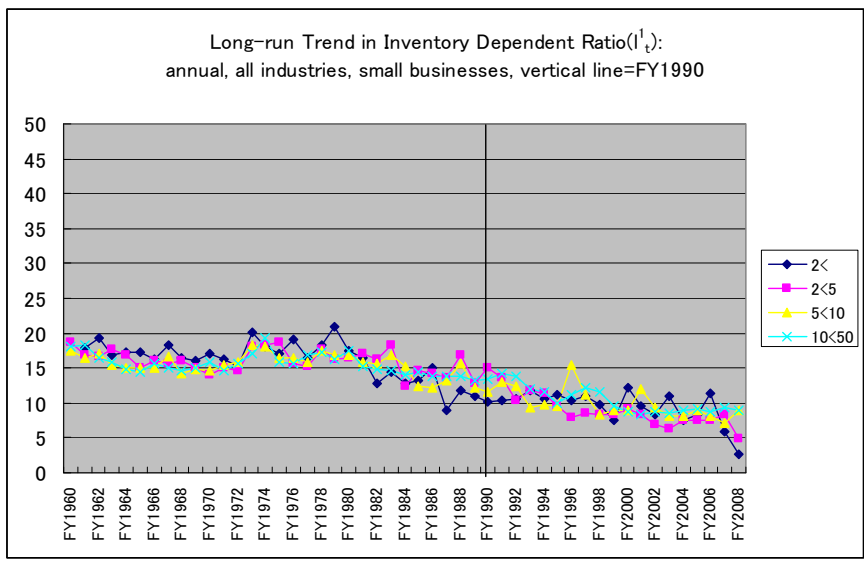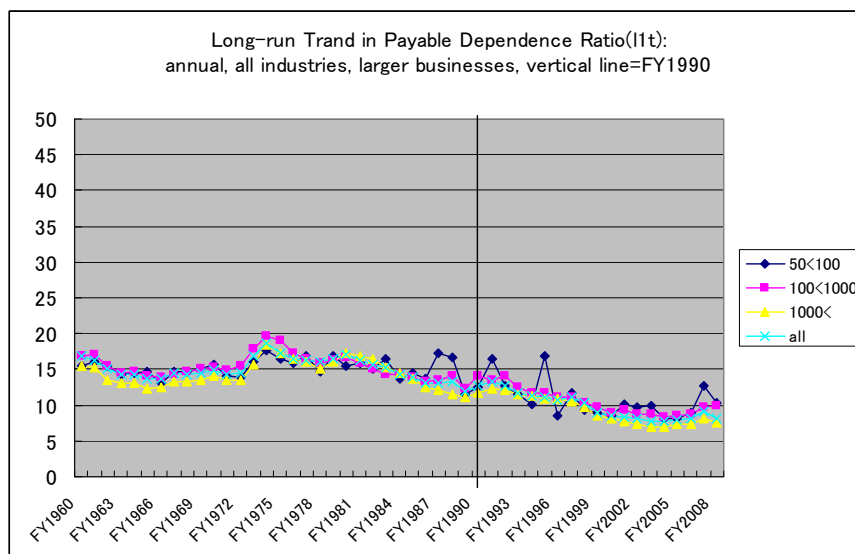
Readers who accept the conventional wisdom that trade credit has been used for inventory finance should compare the trends in both the levels and changes in receivable- and payable dependence ratio.

Choice between trade credit (trade partners) and bank borrowing (banks)

[III-3], entitled "Choice between trade credit (trade partners) and bank borrowing (banks): Introductory discussion", is just an introductory discussion. It does not fit in so easily with summary.

Here I simply introduce one concise fact. Particularly during the heyday of the "dual structure" theory, a large portion of bills receivable (part of receivables) were discounted by banks. The ratio of outstanding amount of discounted bills receivable to total assets used to be fairly high in every firm size class. For banks, it was one of the major forms of lending to firms. What is important here are that the lending rate in this form was almost at the equivalent level with the one in other major lending form like certificate lending, and that in every firm size class many firms did not discount at banks a dominant portion of their bills receivable, suggesting that the choice was not a corner solution.

Comparison of firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (type A) and firms with zero-short-term-bank-borrowing (type B):

Distribution of individual item's composition ratio

In [III-4]~[III-7], as the first step of investigating the relationships among relevant variables, I compare the two groups of firms, firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (type A) and firms

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with zero-short-term-bank-borrowing (type B). It is based on the expectation that there is an essential difference between two types of firms, which is revealed in firm's choice, so that through comparison we will obtain useful information and hints for future research on the decision mechanism on short-term bank borrowing and the causality in making decisions concerning financial variables. It is to seek a clue to think: "Is it because they could not obtain loans from banks? Or they did not?" "On what factors their decision depends?"

[III-4] and [III-5] focus on the individual item's composition ratio (level variables), and [III-6] and [III-7] on the difference variables.

For illustration, here I introduce two figures on the distribution of payable dependence ratio, for all firms surveyed in all industries, and their comparison table ([III-4-4]).
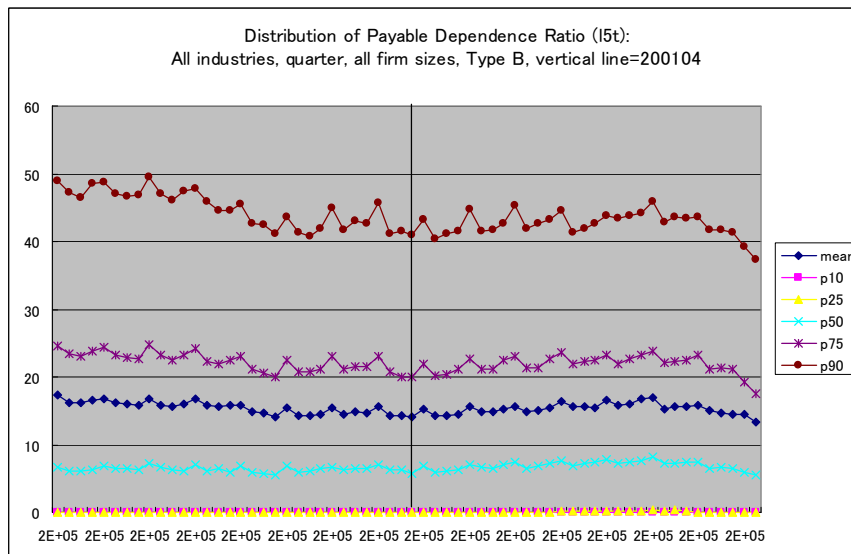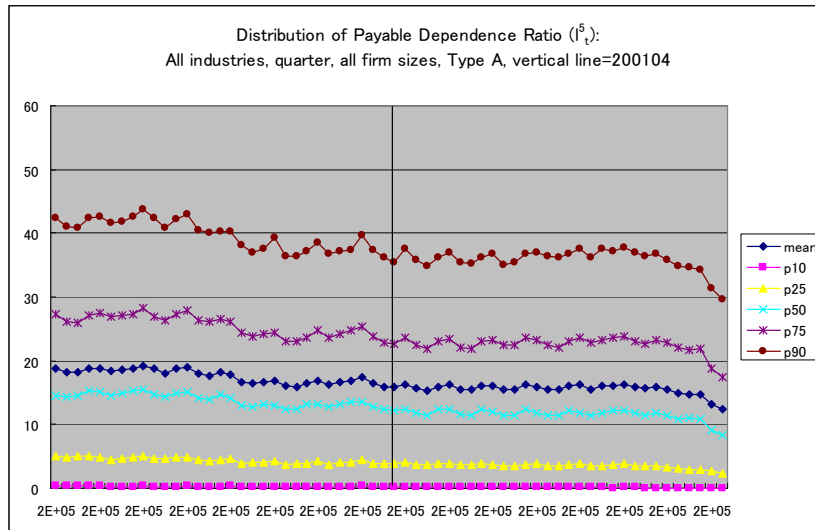
Distribution of Payable Dependence Ratio (I^5_t):
All industries, quarter, all firm sizes, Type A, vertical line=200104

Distribution of Payable Dependence Ratio (I5t):
All industries, quarter, all firm sizes, Type B, vertical line=200104

Distribution of payable dependence ratio (I^5_t): Comparison of firms in Type A and Type B, unit=%

all industries, all size firms

		mean	p10	p25	p50	p75	p90
Firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (A)	Average 1	17.53	0.21	4.38	13.86	25.48	39.64
	Average 2	15.49	0.10	3.48	11.54	22.49	35.83
	Average T	16.54	0.15	3.94	12.74	24.03	37.80
	Av.1 − Av.2	2.04	0.11	0.89	2.32	2.98	3.81
Firms with zero-short-term-bank-borrowing at the beginning of the quarter (B)	Average 1	15.46	0.00	0.00	6.34	22.30	44.84
	Average 2	15.30	0.00	0.07	6.95	21.83	42.57
	Average T	15.39	0.00	0.03	6.64	22.07	43.75
	Av.1 − Av.2	0.16	0.00	−0.07	−0.61	0.47	2.27
(A) − (B)	Average 1	2.07	0.21	4.38	7.52	3.18	−5.20
	Average 2	0.18	0.10	3.41	4.59	0.66	−6.74
	Average T	1.15	0.15	3.91	6.10	1.96	−5.95
	Av.1 − Av.2	1.88	0.11	0.96	2.93	2.52	1.54

Next, I list "particularly prominent observations" in [III-4] for all industries ([III-4-1]).

(1) Both in all industries and in manufacturing industry, there is a remarkable difference between two groups of firms in the level of the ratio of deposit to total asset, particularly in p50, p75, p90, and mean. This pattern has consistently continued over the study period. However, for instance the p50 value of type B falls far short of the p75 value of type A, which shows that all the type B firms hold higher ratio (to total asset) of deposit than all the type A firms.

(2) There is a prominent difference between two types of firms in long-term bank dependence ratio. In addition, concerning the type B firms there is a noteworthy difference between the first half and the second half of the period. (We executed comparison by firm size of the distribution of long-term bank dependence ratio in [I-2-4] for all industries, and in [I-3-2] for manufacturing industry.) Particularly for the type B large firms, the long-term bank dependence ratio decreased dramatically in the second half period.

(3) Rather we had better pay the prime attention to the observation that there is no difference between two types of firms, concerning receivable, payable, and inventory. In addition, there is no difference in that distribution pattern remains stable throughout most of the study period and that during the period of recent "financial crisis" both ratio of receivable and payable (but not inventory) decreased dramatically.

Comparison of firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (type A) and firms with zero-short-term-bank-borrowing (type B):

Distribution of change in individual item's composition ratio

[III-6] and [III-7] examine the distribution of change in individual item's composition ratio, comparing two groups of firms, firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (type A) and firms with

zero-short-term-bank-borrowing (type B). Basically, examination methods are the same as the ones adopted in [III-4] and [III-5].

For illustration, here as well I introduce two figures on the distribution of change in payable dependence ratio, for all firms surveyed in all industries, and their comparison table ([III-6-4]).
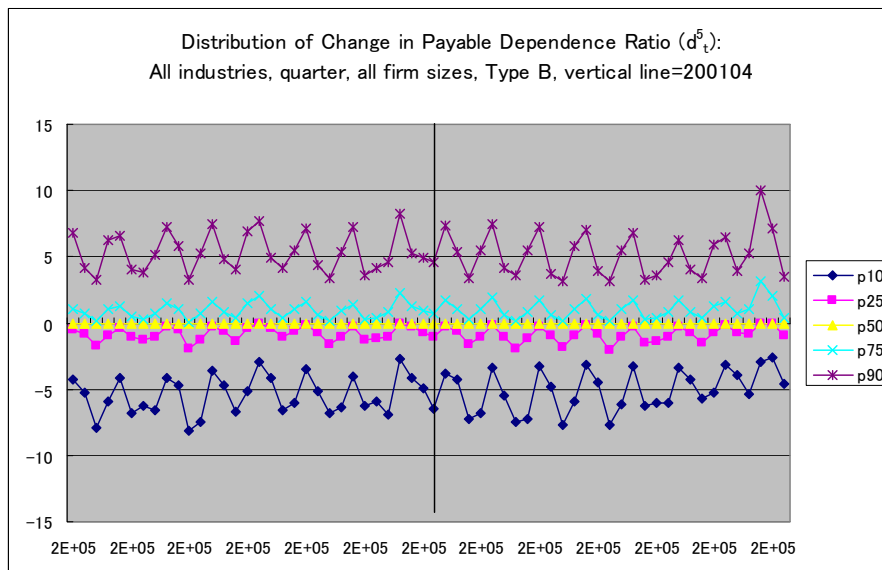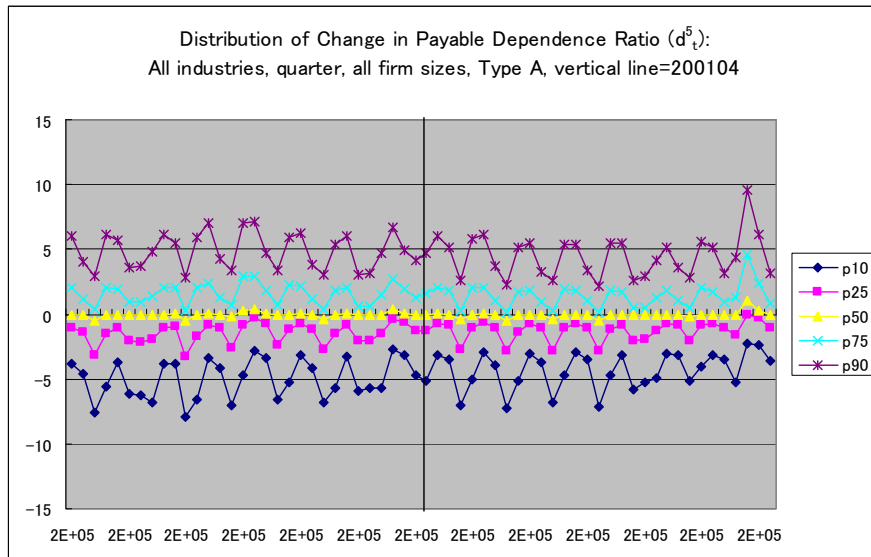
Distribution of change in payable dependence ratio (d^5_t): Comparison of firms in Type A and Type B, unit=%

all industries, all size firms

		p10	p25	p50	p75	p90
Firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (A)	Average 1	−5.00	−1.48	−0.01	1.56	4.86
	Average 2	−4.30	−1.25	−0.02	1.40	4.47
	Average T	−4.66	−1.37	−0.01	1.48	4.67
	Av.1 − Av.2	−0.70	−0.22	0.02	0.16	0.39
Firms with zero-short-term-bank-borrowing at the beginning of the quarter (B)	Average 1	−5.46	−0.82	0.00	0.92	5.31
	Average 2	−5.06	−0.87	0.00	1.04	5.20
	Average T	−5.27	−0.84	0.00	0.98	5.26
	Av.1 − Av.2	−0.40	0.05	0.00	−0.12	0.11
(A) − (B)	Average 1	0.46	−0.66	−0.01	0.64	−0.45
	Average 2	0.76	−0.39	−0.02	0.36	−0.73
	Average T	0.60	−0.53	−0.01	0.51	−0.58
	Av.1 − Av.2	−0.30	−0.27	0.02	0.28	0.28

Nowhere in [III-6] and [III-7], represented in figures and table introduced above, I find prominent difference between two firm groups. For example, no prominence difference became obvious during the "Credit Crunch" in 1997-1999 or the "financial crisis" of 2007.

[I&S-7]. Simple Overview of DP4

Based on the results of DP1 and DP2, DP4, entitled "The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (2) Correlation Coefficients and Multiple Regressions", together with DP3, focuses on "trade credit" like receivable and payable. In DP3 and DP4, as the first step to investigate the reality of firm's behavior on financing and asset choice I see balance-sheet items other than "capital" and borrowing from financial institutions, of which DP4 is the second half.

In DP4, by studying correlation coefficients among financial variables and through multiple regressions I examine the relationships among those choice variables. The first half, [IV-2]~[IV-3], is for studying correlation coefficients, upon which the second half, [IV-4]~[IV-5], is for multiple regressions.

Neither correlation coefficients studies nor multiple regressions in DP4 is an empirical study of the standard type in the sense that it is not testing hypotheses drawn from careful theoretical investigation. The primary aim is to organize basic information as a foundation for promoting of theoretical- and empirical investigations, which will lead us to appropriate and better understanding of financial and capital markets in Japan. Concurrently, by careful examination with reference to detailed firm-level data, it helps us to escape from the present state where the conventional wisdom has been established as the dominant view that is primarily based on sketchy report or story of "expert's" personal experience, neither with quantitative data nor rough size estimates.

Like in the previous discussion, I examine both "level variables" and "difference variables". [IV-2] and [IV-3] examine the correlation coefficients between "level variables" and "difference variables", respectively.

At this time, no useful and appropriate information is available for questions like "How do firms choose decision variables, upon which 'composition ratios' are determined?" and "What should we expect to find in relationship and interlocking movement among 'composition ratios'?" In what follows in DP4, I organize information focusing on (1) the relation between variable on short-term borrowing from financial institutions and other financial variables, and (2) inter-relations among 3 variables, receivable, payable, and inventory. As "other variables" for the former, I focus on 5 variables, long-term borrowing, deposit, receivable, payable, and inventory.

In most cases "composition ratios" are "structural" in the sense that, depending on such factors as the situation, substance of business, and trade customs of the industry the firm belongs, its firm size, and others, those ratios do not change radically not only during a quarter but also during the whole study period. Accordingly, I chose

the examination objects selectively. This selectivity increases more in [IV-4] for multiple regressions, where examination is limited to the manufacturing industry to reduce the noises due to industry-specific factors and focused on firms with non-zero-short-term-bank-borrowing at the beginning of the quarter. The latter choice is because there are so many zero-short-term-borrowing-firms that correlation coefficients between short-term-borrowing variable and other variables and multiple regressions on short-term-borrowing variables would be seriously distorted. In examining inter-relations among 3 variables, receivable, payable, and inventory, particularly in multiple regressions, I also compare two groups of firms, non-zero-short-term-bank-borrowing firms with zero-short-term-bank-borrowing firms.

In examining changes in composition ratios, focusing on "difference variables", I assumed that the "structural" factors that determine the composition ratios did not change radically in a short period of time, upon which I expected to find stable relationship and interlocking movement among changes in 'composition ratios' . (This expectation was completely violated, however.)

The catalogue of correlation coefficients is the same as in "composition ratios" study. In addition, I contrive ways also to investigate questions: "Can we observe during the period of 'Credit Crunch' or 'financial crisis' shocks that 'change' the relations observed in peace-time?"; "Can we observe under the 'ultra-easy credit policy with zero-interest lending rate' any change in 'relationships' observed in other periods?"

With 3 reasons, particularly in the part on multiple regressions, I limit the number of basic tables, with adding its variations: (1) It needs huge time and energy in preparing tables on correlation coefficients and multiple regressions; (2) The marginal rate of return on increasing the number of tables decreases rapidly; (3) It is cumbersome also for readers to increase further the number of such tables.

Both in [IV-2] on composition ratios and in [IV-3] in changes on composition ratios, with the only exception between receivable and payable, there is no noteworthy "relationship" between any pair of variables. For example, between short-term bank borrowing and other variables, there is no noteworthy relationship, with the only exception of often observed strong negative "relationship" with long-term bank borrowing. This point holds also in the periods of the "Credit Crunch" and the "financial crisis" or the period under the "ultra-easy credit policy with zero-interest lending rate".

Taking the above results into consideration, in multiple regressions in [IV-4] and [IV-5] I place focus on the inter-relations among 3 variables (receivable, payable, and inventory), particularly between receivable and payable. Specifically, I choose as the basic point of reference the study of manufacturing firms with non-zero-short-term-

bank-borrowing at the beginning of the quarter, to which I add many variations. Noticing that relations are stable in cases where "strong" relations are observed, I choose to table the results once in 3 years (of the 1st quarter of the fiscal year), 6 time points during the study period. At the heart of the study is the multiple regression of receivable composition ratio (and change in receivable composition ratio) on payable composition ratio (and change in payable composition ratio) and inventory composition ratio (and change in inventory composition ratio).

Correlation coefficients among composition ratios

For illustration I introduce here the correlation coefficients table on non-zero-short-term-bank-borrowing firms in the manufacturing industry, in all size categories, which is the most representative among correlation coefficients tables in my study ([IV-2-2]).

As shown above (detailed in DP1), most firms with zero-short-term-bank-borrowing at the beginning end the quarter also with zero-short-term-bank-borrowing. Of 8 correlation coefficients listed on the table for every quarter, 5 are between short-term-borrowing and other variables.

Correlation Coefficients among Composition Ratios (I^i_t)   Manufacturing, All Industries, All Firm Sizes

	N	I^1_t vs. I^2_t	I^1_t vs. I^3_t	I^1_t vs. I^4_t	I^1_t vs. I^5_t	I^1_t vs. I^6_t	I^4_t vs. I^5_t	I^4_t vs. I^6_t	I^5_t vs. I^6_t
199401	7,060	0.040	−0.097	−0.034	−0.044	0.157	0.547	0.046	0.170
199402	7,003	0.022	−0.091	−0.038	−0.060	0.159	0.511	0.014	0.167
199403	6,835	0.022	−0.103	−0.051	−0.055	0.175	0.540	0.038	0.163
199404	6,833	0.035	−0.101	−0.045	−0.068	0.160	0.515	0.011	0.156
199501	6,936	0.067	−0.095	−0.052	−0.066	0.121	0.509	0.027	0.190
199502	6,981	0.058	−0.092	−0.047	−0.052	0.127	0.490	0.031	0.223
199503	6,916	0.054	−0.098	−0.046	−0.042	0.112	0.510	0.041	0.209
199504	1,814	0.047	−0.071	−0.038	−0.051	0.103	0.498	0.026	0.209
199601	6,553	0.038	−0.089	−0.057	−0.045	0.094	0.528	0.048	0.170
199602	6,532	0.015	−0.087	−0.038	0.012	0.097	0.302	0.035	0.131
199603	6,501	0.001	−0.088	−0.044	−0.031	0.060	0.535	0.039	0.167
199604	6,362	0.025	−0.096	−0.038	−0.041	0.094	0.506	0.015	0.162
199701	6,549	0.006	−0.048	−0.047	−0.046	0.068	0.486	0.040	0.174
199702	6,525	0.000	−0.048	−0.044	−0.044	0.064	0.420	0.031	0.218
199703	6,444	0.012	−0.110	−0.034	−0.040	0.106	0.446	0.042	0.203
199704	6,359	0.004	−0.093	−0.029	−0.049	0.110	0.402	0.019	0.136
199801	6,542	0.025	−0.103	−0.059	−0.033	0.142	0.551	0.050	0.159
199802	6,407	0.023	−0.087	−0.053	−0.049	0.134	0.518	0.059	0.171
199803	6,391	0.020	−0.115	−0.042	−0.044	0.137	0.523	0.070	0.161
199804	6,211	0.015	−0.109	−0.021	−0.045	0.126	0.500	0.038	0.141
199901	6,664	0.040	−0.127	−0.035	−0.027	0.133	0.527	0.053	0.182
199902	6,560	0.063	−0.129	−0.015	−0.023	0.123	0.514	0.046	0.186
199903	6,445	0.058	−0.140	−0.010	−0.027	0.135	0.550	0.060	0.177
199904	6,311	0.042	−0.110	−0.013	−0.032	0.118	0.537	0.042	0.168
200001	6,530	0.016	−0.129	−0.041	−0.060	0.142	0.564	0.057	0.155
200002	6,456	0.046	−0.101	−0.037	−0.005	0.137	0.532	0.054	0.173
200003	6,324	0.045	−0.114	−0.028	−0.027	0.140	0.532	0.073	0.187
200004	6,189	0.041	−0.110	−0.023	−0.014	0.144	0.517	0.041	0.186
200101	6,368	0.037	−0.262	0.098	0.105	0.090	0.571	0.063	0.177
200102	6,360	0.052	−0.122	−0.014	−0.018	0.103	0.534	0.056	0.197
200103	6,264	0.046	−0.139	0.009	0.004	0.112	0.541	0.060	0.172
200104	6,102	0.066	−0.120	−0.002	−0.002	0.113	0.528	0.038	0.167
200201	6,424	0.063	−0.115	−0.047	−0.053	0.101	0.580	0.057	0.146
200202	6,417	0.060	−0.131	−0.034	−0.051	0.118	0.549	0.051	0.156
200203	6,293	0.086	−0.121	−0.045	−0.046	0.089	0.577	0.061	0.139
200204	6,118	0.056	−0.114	−0.041	−0.010	0.087	0.572	0.039	0.137
200301	6,399	0.036	−0.073	−0.031	0.326	0.068	0.491	0.073	0.132
200302	6,334	0.057	−0.095	−0.019	0.208	0.083	0.462	0.067	0.137
200303	6,305	0.050	−0.073	−0.023	0.360	0.064	0.495	0.070	0.137
200304	6,219	0.129	−0.119	−0.038	−0.004	0.127	0.536	0.034	0.148
200401	6,672	0.024	−0.094	−0.034	−0.019	0.119	0.575	0.070	0.163
200402	6,579	0.021	−0.114	−0.048	−0.016	0.106	0.552	0.074	0.184
200403	6,541	0.017	−0.105	−0.046	−0.043	0.119	0.569	0.088	0.177
200404	6,489	0.018	−0.100	−0.046	−0.040	0.115	0.548	0.050	0.172
200501	6,616	0.093	−0.107	−0.050	−0.042	0.116	0.312	0.090	0.108
200502	6,588	0.078	−0.114	−0.045	−0.035	0.110	0.204	0.084	0.073
200503	6,499	0.081	−0.092	−0.053	−0.033	0.110	0.276	0.079	0.085
200504	6,376	0.106	−0.095	−0.045	−0.060	0.109	0.541	0.066	0.188
200601	6,509	0.118	−0.091	−0.077	−0.004	0.117	0.538	0.093	0.164
200602	6,516	0.104	−0.102	−0.061	−0.062	0.115	0.578	0.083	0.202
200603	6,404	0.139	−0.094	−0.056	−0.060	0.108	0.578	0.064	0.174
200604	6,349	0.119	−0.080	−0.056	−0.062	0.102	0.562	0.054	0.177
200701	6,389	0.083	−0.086	−0.060	0.012	0.113	0.556	0.106	0.185
200702	6,379	0.090	−0.097	−0.045	0.021	0.102	0.544	0.111	0.207
200703	6,356	0.088	−0.093	−0.045	0.014	0.103	0.536	0.098	0.177
200704	6,197	0.092	−0.089	−0.023	0.016	0.111	0.521	0.073	0.169
200801	6,440	0.051	−0.045	−0.029	−0.034	0.099	0.532	0.063	0.134
200802	6,362	0.051	−0.050	−0.025	−0.027	0.101	0.548	0.062	0.165
200803	6,304	0.038	−0.087	−0.031	−0.013	0.093	0.566	0.051	0.168
200804	6,184	0.040	−0.098	−0.027	−0.037	0.098	0.547	0.055	0.166
200901	6,087	0.077	−0.094	−0.027	−0.033	0.128	0.555	0.066	0.179
200902	6,054	0.104	−0.116	−0.024	−0.040	0.126	0.590	0.059	0.181
Average 1	6,385	0.034	−0.107	−0.030	−0.032	0.120	0.509	0.043	0.175
Average 2	6,380	0.072	−0.096	−0.041	0.004	0.105	0.520	0.070	0.158
Average T	6,383	0.052	−0.102	−0.036	−0.014	0.113	0.514	0.056	0.167
Av.1 − Av.2	5	−0.039	−0.011	0.011	−0.036	0.015	−0.011	−0.027	0.017

Here I use "level variables", $l^1_t \sim l^6_t$ for short-term borrowing, long-term borrowing, deposit, receivable, payable, and inventory, respectively. For example l^1_t vs. l^5_t stands for the correlation coefficient between short-term borrowing dependence ratio and payable dependence ratio.

N stands for the number of samples surveyed, and the number on the first column shows the quarter surveyed. As mentioned above, 199401 stands for the 1st quarter of FY1994. 5 columns from the 3rd to 7th are for correlation coefficient between short-term bank borrowing variable (l^1_t) and other variables, and the last 3 for 3 variables (receivable l^4_t, payable l^5_t, and inventory l^6_t).

For reader's convenience, I box correlation coefficient when its absolute value exceeds 0.4, suggesting an extremely strong relationship.

The 4 rows at the bottom of the table show, as before, the averages and its difference. Average 1, Average 2, Average T, respectively, stands for the average of correlation coefficient in the first half period (from FY1994 to FY2001), in the second half period (from FY2002 to the 2nd quarter of FY2009), and the whole study period, and the last row is for the difference between Average 1 and Average 2.

Those explanations apply also to [IV-3] on changes in composition ratios, with the exception of variables where I use d_i instead of l_i.

Three points are obvious. (1) The correlation coefficient between l_4 and l_5 (receivable and payable) on the 3rd column from the right almost always exceeds 0.4, implying that there is stably an extremely strong relationship between them. (2) In other pair of variables, we find no correlation coefficient whose absolute value exceeds 0.4, and almost everywhere its absolute value by far lower than 0.4. (3) We find no noteworthy change in the levels and signs of correlation coefficients either between the "Credit Crunch" in 1997-1999 or the "financial crisis" of 2007 and remaining study period or between the first half period and the second half under the "ultra-easy credit policy with zero-interest-lending-rate".

Concerning the correlation coefficients between l_4 and l_5 (receivable and payable), (1) correlation coefficients for all the industries are higher than the ones for the manufacturing industry, (2) correlation coefficients for firms with non-zero-short-term-bank borrowing at the beginning of the quarter are higher than the ones for all firms, and (3) correlation coefficients are higher for large (or medium-sized) firms than the ones for smaller firms.

Correlation coefficients among changes in composition ratios

Also concerning correlation coefficients among changes in composition ratios,

for illustration, I introduce here the correlation coefficients table on non-zero-short-term-bank-borrowing firms in the manufacturing industry, in all size categories, which is the most representative among correlation coefficients tables in my study ([IV-3-2]).

Here I use "difference variables", $d^1_t \sim d^6_t$, for change in short-term borrowing, long-term borrowing, deposit, receivable, payable, and inventory, respectively. For example d^1_t vs. d^5_t stands for the correlation coefficient between changes in short-term borrowing dependence ratio and change in payable dependence ratio.

The basic result of the study on correlation coefficients among "difference variables" is almost the same with that on correlation coefficients among "level variables". For example, the average of correlation coefficients over the whole study period (Average T) of "difference variables" on receivable and payable is 0.513, and the one for "level variables" is 0.514.

Two points might gather attention. First, outside the pair of receivable and payable (d^4_t vs. d^5_t), there sometimes, but not quite often (8 on the table), appear correlation coefficients whose absolute value exceed 0.4. Second, we observe a consistently stable negative[29] strong relation between short-term bank borrowing and long-term bank borrowing (d^1_t vs. d^2_t). Its Average T is -0.237, and the absolute value of its correlation coefficient exceed 0.4 in 4 quarters which interestingly are all during the "Credit Crunch" of 1997-1999. In this research, however, I have not asked why.

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[29] Note that it is "negative" correlation rather than "positive" one.

Correlation Coefficients among Changes in Composition Ratios (d^i_t)   Manufacturing, All Firm Sizes, Type A

	N	d^1_t vs. d^2_t	d^1_t vs. d^3_t	d^1_t vs. d^4_t	d^1_t vs. d^5_t	d^1_t vs. d^6_t	d^4_t vs. d^5_t	d^4_t vs. d^6_t	d^5_t vs d^6_t
199401	5399	−0.381	0.179	0.069	0.019	0.071	0.497	−0.066	0.185
199402	5277	−0.276	0.124	0.145	0.028	0.111	0.561	−0.025	0.414
199403	5190	−0.249	0.144	0.460	0.389	0.095	0.687	−0.138	0.118
199404	5207	−0.276	0.126	0.200	0.098	0.135	0.638	−0.085	0.258
199501	5363	−0.276	0.162	0.228	0.033	0.120	0.560	−0.098	0.219
199502	5337	−0.334	0.123	0.143	−0.046	0.083	0.551	−0.101	0.159
199503	5314	−0.298	0.120	0.135	0.004	0.091	0.435	−0.166	0.182
199504	5236	−0.384	0.152	0.105	−0.027	0.036	0.513	−0.291	0.047
199601	5008	−0.312	0.147	0.152	0.020	0.074	0.545	−0.152	0.198
199602	4972	−0.082	0.113	0.136	−0.025	0.080	0.615	−0.037	0.199
199603	4963	−0.233	0.207	0.154	−0.021	0.092	0.529	−0.157	0.121
199604	4877	−0.230	0.191	0.147	−0.026	0.059	0.581	−0.251	0.062
199701	4948	−0.343	0.115	0.169	0.056	0.129	0.533	−0.116	0.214
199702	4873	−0.974	−0.160	0.039	−0.005	0.021	0.432	−0.083	0.265
199703	4847	−0.292	0.066	0.194	0.004	0.110	0.477	−0.120	0.112
199704	4795	−0.491	0.124	0.103	−0.005	0.054	0.552	−0.288	0.023
199801	4869	−0.206	0.202	0.142	−0.014	0.057	0.532	−0.124	0.235
199802	4756	−0.449	0.122	0.177	−0.026	0.191	0.470	−0.074	0.179
199803	4771	−0.365	0.146	−0.038	−0.031	0.134	0.607	−0.066	0.206
199804	4647	−0.438	0.144	0.119	0.023	0.049	0.789	−0.264	−0.045
199901	4881	−0.165	0.103	0.195	0.048	0.224	0.548	−0.050	0.198
199902	4768	−0.363	0.081	0.167	0.033	0.257	0.503	−0.080	0.217
199903	4726	0.234	0.153	0.336	−0.003	0.086	0.506	−0.058	0.149
199904	4623	−0.135	0.189	0.089	0.005	0.085	0.491	−0.287	0.025
200001	4761	−0.335	0.200	0.172	0.015	0.123	0.491	−0.099	0.193
200002	4588	0.199	0.167	0.134	0.099	0.063	0.527	−0.050	0.203
200003	4566	−0.241	0.174	0.079	−0.044	0.153	0.396	−0.083	0.319
200004	4451	−0.213	0.126	0.089	−0.037	0.062	0.399	−0.342	0.005
200101	4561	−0.229	0.268	−0.145	0.049	0.129	−0.035	−0.075	0.173
200102	4485	−0.287	0.219	0.230	0.071	0.089	0.538	−0.063	0.233
200103	4435	−0.162	0.218	0.696	0.657	0.082	0.867	−0.120	0.060
200104	4303	−0.342	0.251	0.040	0.029	0.089	0.532	−0.299	0.114
200201	4480	−0.306	0.290	0.156	−0.005	0.068	0.499	−0.188	0.126
200202	4346	−0.344	0.133	0.074	−0.054	−0.014	0.530	0.010	0.324
200203	4301	0.276	0.046	0.189	0.005	0.084	0.456	−0.164	0.335
200204	4143	−0.357	0.317	0.087	−0.019	0.078	0.510	−0.263	0.121
200301	4302	−0.267	0.287	0.072	−0.041	0.050	0.291	−0.127	0.114
200302	4179	−0.284	0.212	0.113	0.020	0.132	0.465	−0.039	0.209
200303	4205	−0.027	0.057	0.020	0.114	0.051	0.559	0.191	0.275
200304	4071	−0.321	0.330	0.079	−0.032	0.053	0.457	−0.304	0.014
200401	4299	−0.190	0.210	0.144	0.032	−0.034	0.571	−0.114	0.117
200402	4130	−0.287	0.157	0.146	0.042	0.147	0.488	−0.054	0.263
200403	4116	−0.199	0.125	0.138	0.004	0.185	0.535	−0.046	0.228
200404	4048	−0.181	0.253	0.131	0.007	0.032	0.474	−0.314	0.103
200501	4180	−0.161	0.058	0.180	−0.065	0.152	0.509	−0.144	0.177
200502	4101	−0.238	0.186	0.118	−0.062	0.054	0.384	−0.142	0.242
200503	4041	−0.228	0.267	0.241	0.085	0.049	0.518	−0.205	0.139
200504	3920	−0.238	0.120	0.139	−0.038	0.099	0.502	−0.240	0.162
200601	3978	−0.299	0.150	0.143	0.013	0.154	0.562	−0.015	0.268
200602	3929	−0.086	−0.196	0.131	−0.208	0.033	0.412	−0.087	0.178
200603	3869	−0.105	0.131	0.099	0.006	0.141	0.509	−0.064	0.254
200604	3811	−0.143	0.105	0.091	0.008	0.046	0.489	−0.245	0.082
200701	3827	−0.273	0.220	0.162	0.043	0.083	0.394	−0.118	0.244
200702	3787	−0.272	0.189	0.155	−0.028	0.072	0.480	−0.074	0.217
200703	3798	−0.154	0.130	0.181	0.007	0.074	0.393	−0.168	0.229
200704	3722	−0.269	0.212	0.137	−0.065	0.110	0.510	−0.230	0.097
200801	3784	−0.205	0.070	−0.328	−0.524	0.065	0.676	−0.089	0.170
200802	3698	−0.026	0.117	0.127	−0.034	−0.029	0.469	−0.090	0.283
200803	3678	−0.217	0.123	0.098	0.017	0.239	0.577	−0.071	0.272
200804	3605	−0.147	0.075	0.117	−0.032	0.006	0.593	−0.101	0.243
200901	3653	−0.030	0.045	0.051	−0.039	0.106	0.567	−0.112	0.202
200902	3556	−0.221	0.060	−0.146	−0.214	0.076	0.577	−0.117	0.225
Average 1	4,869	−0.279	0.147	0.158	0.043	0.101	0.527	−0.135	0.164
Average 2	3,985	−0.193	0.149	0.102	−0.035	0.079	0.498	−0.124	0.197
Average T	4,441	−0.237	0.148	0.131	0.005	0.090	0.513	−0.129	0.180
Av.1 − Av.2	883	−0.086	−0.003	0.057	0.078	0.022	0.029	−0.010	−0.033

Multiple regressions on composition ratios

   Following the study on correlation coefficients in [IV-2] and [IV-3], I study in [IV-4] and [IV-5] the inter-relations among variables with multiple regressions.

   As shown in [IV-2] and [IV-3], either among "level variables" or "difference variables", with the sole prominent exception of the one between receivable and payable, there is no consistently stable relation among variables with high absolute value correlation coefficients. Upon the result of the study on correlation coefficients in [IV-2] and [IV-3], multiple regressions in [IV-4] and [IV-5] focus on the relationship between receivable and payable. Here following questions are of the primary concern.

(1) Of the two variables with a high correlation coefficient, what is the value of regression coefficient? How about its t-value and the Adjusted R-squares value of regression equation?

(2) What are those values when we add other variables like inventory? In that case, what is the size and sign of regression coefficient and t-value of inventory variable? Which values are larger in the regression of receivable (payable) on payable (receivable) and inventory? Does the regression result support the previous conclusion from correlation coefficients that the former relation is stronger?

(3) Do those values wildly vary by firm size or across time? Did they change radically during the "Credit Crunch" in 1997-1999, for instance?

Assuming that the relationships both among "composition ratios" (l^i_ts) and among changes in "composition ratios" (d^i_ts) are "structural" and do not change radically not only during a quarter but also during the whole study period, I choose in [IV-4] and [IV-5] as the basic point of reference the study of manufacturing firms with non-zero-short-term-bank borrowing at the beginning of the quarter, to which I add many variations. Results on variations are to be seen with reference to the table on the basic case. In variations, I table the results once in 3 years (of the 1st quarter of the fiscal year), 6 time points during the study period.

   The 4 rows at the bottom of the table show, as before, the "averages" (for the basic case I show "Average 1", "Average 2", "Average T", and "Av.1-Av.2"). Those "averages" have no specific meaning, they are just for illustration.[30]

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[30] In DP4, readers should note that in some cases, like regression coefficient and its t-value in v4=9 at 200301 in the manufacturing industry ([IV-4-4]), 3 t-values of regression coefficients on payable in the 2nd table for variation 1 and the t-value at

The results of multiple regressions on "level variables" (l^i_ts) in [IV-4] and those on "difference variables" (d^i_ts) are surprisingly similar. The latter results were expected to vary wildly both across quarters and periods, but they were extremely stable throughout the study period. In this regard, my expectations were off the point, and the results are amazing.

With various specifications I compare two groups of firms, firms with non-zero-short-term-bank-borrowing at the beginning of the quarter (type A, v18[31]>0) and firms with zero-short-term-bank-borrowing (type B, v18=0). Although there appear slight differences both in regression coefficients and their t-values, but there is no prominent difference between those two groups. In this sense, there is no noteworthy difference in firm behavior, financing in particular, between them. The comparison is based on the expectation that there is an essential difference between two types of firms, which is revealed in firm's choice, so that through comparison we will obtain useful information and hints for future research on the decision mechanism on short-term bank borrowing and the causality in making decisions concerning financial variables.

The above conclusion holds also during the "Credit Crunch" in 1997-1999, the "financial Crisis" of 2007, and the period under the ultra-easy credit policy in the 2000s.

For illustration, I show here the table on the basic case of [the manufacturing industry, all sizes, and v18>0] for [receivable (l^4_t) = f (payable (l^5_t), inventory (l^6_t))].

200301 in the 2nd table for variation 3 (both in [IV-5-1]), "outliers" in regression coefficients or their t-values due to unexplored reasons remarkably increase the average values.

[31] In this paper y^1_t is for the outstanding amount of short-term borrowing from financial institutions at time t. In the discussion papers in Japanese, following the original dataset, it is expressed as v18, which for reader's convenience I maintain often in figures and tables in this paper.

Multiple Regressions: $I^4_t=f(I^5_t, I^6_t)$ Manufacruting, All Firm Sizes, Type A (v18>0)

	payable (I^5_t)		inventory (I^6_t)		
	coefficient	t-value	coefficient	t-value	Adj R-square
199401	0.530	49.66	−0.056	−3.72	0.315
199402	0.517	45.53	−0.082	−5.52	0.282
199403	0.537	48.15	−0.058	−3.91	0.309
199404	0.539	47.34	−0.076	−5.01	0.301
199501	0.536	49.81	−0.081	−5.20	0.317
199502	0.523	48.36	−0.102	−6.74	0.305
199503	0.531	48.74	−0.060	−3.81	0.311
199504	0.518	45.99	−0.091	−5.71	0.288
199601	0.555	49.36	−0.050	−3.05	−0.050
199602	0.118	19.54	0.012	0.68	0.072
199603	0.560	48.58	−0.045	−2.93	0.324
199604	0.543	46.12	−0.063	−3.92	0.304
199701	0.576	49.46	−0.045	−2.79	0.332
199702	0.518	44.59	−0.081	−5.13	0.290
199703	0.527	45.34	−0.060	−3.86	0.299
199704	0.502	41.05	−0.079	−4.90	0.260
199801	0.562	45.63	−0.032	−1.96	0.302
199802	0.533	43.20	−0.030	−1.96	0.284
199803	0.536	42.42	−0.010	−0.62	0.277
199804	0.526	40.47	−0.026	−1.65	0.262
199901	0.526	44.07	−0.031	−1.97	0.286
199902	0.503	41.32	−0.030	−1.93	0.266
199903	0.562	46.28	−0.030	−1.94	0.314
199904	0.539	43.59	−0.065	−4.06	0.292
200001	0.624	50.68	−0.032	−1.95	0.352
200002	0.513	42.32	−0.035	−2.19	0.282
200003	0.542	43.81	−0.029	−1.72	0.300
200004	0.548	43.92	−0.080	−4.94	0.302
200101	0.620	51.43	−0.023	−1.28	0.370
200102	0.552	44.33	−0.049	−3.05	0.306
200103	0.572	43.81	−0.027	−1.66	0.304
200104	0.580	43.19	−0.068	−4.33	0.302
200201	0.678	53.41	−0.004	−0.23	0.390
200202	0.640	49.38	−0.009	−0.56	0.361
200203	0.642	50.06	−0.010	−0.68	0.370
200204	0.594	46.02	−0.045	−2.80	0.338
200301	0.376	33.61	0.032	1.74	0.211
200302	0.432	36.87	−0.005	−0.32	0.247
200303	0.362	32.88	0.016	0.91	0.207
200304	0.530	41.66	−0.033	−1.97	0.299
200401	0.599	47.92	−0.022	−1.31	0.351
200402	0.565	44.50	−0.017	−1.04	0.327
200403	0.589	47.25	−0.017	−1.06	0.356
200404	0.566	44.90	−0.056	−3.42	0.333
200501	0.610	47.08	−0.009	−0.53	0.352
200502	0.584	44.81	−0.021	−1.29	0.333
200503	0.605	47.62	−0.024	−1.51	0.363
200504	0.582	44.38	−0.018	−1.04	0.337
200601	0.415	36.87	0.017	0.99	0.258
200602	0.609	48.80	−0.056	−3.67	0.378
200603	0.596	47.51	−0.059	−3.70	0.369
200604	0.581	44.76	−0.066	−4.01	0.345
200701	0.471	39.33	0.008	0.44	0.292
200702	0.454	38.13	−0.010	−0.60	0.281
200703	0.485	39.75	−0.022	−1.29	0.296
200704	0.471	37.79	−0.048	−2.80	0.277
200801	0.614	45.43	−0.049	−3.01	0.354
200802	0.595	45.80	−0.055	−3.50	0.363
200803	0.580	45.09	−0.057	−3.65	0.357
200804	0.574	41.89	−0.054	−3.32	0.329
200901	0.618	42.60	−0.032	−2.20	0.333
200902	0.640	44.49	−0.038	−2.69	0.358
Average 1	0.530	44.94	−0.050	−3.21	0.283
Average 2	0.555	43.69	−0.025	−1.60	0.326
Average T	0.542	44.33	−0.038	−2.43	0.304
Av,1 − Av.2	−0.025	1.25	−0.025	−1.61	−0.042

Multiple regressions on changes in composition ratios

Following the results on composition ratios in [IV-4], [IV-5] reports the results of multiple regressions on changes in composition ratios.

The basic method and pattern of investigation is almost the same as in [IV-4]. Composition ratios (level variables), regarded to be "structural" depending on various "structural" factors, are expected to rarely vary wildly in a short period, but the changes in composition ratios (difference variables) in contrast have possibilities to often vary wildly. Moreover, if we find a prominent "change" in such a specific period as the "Credit Crunch" in 1997-1999, it would be useful in obtaining information about the relationships among difference variables, and further about firm's financing behavior and financial market. Upon this expectation, in multiple regressions on change in composition ratios I prepare 4 basic cases in order to make it easy to compare variations with basic cases. (However, the results, represented by regression coefficients and their t-values, are surprisingly stable throughout the study period, and there is no prominent "change" to focus on.)

The 4 basic cases are all on the manufacturing industry, which are (1) all sizes and v18>0, (2) all sizes and v18=0, (3) v4=5 and v18>0, and (4) v4=8 and v18>0.

The result of the multiple regressions on change in composition ratios, at least seemingly, is surprisingly similar to that on composition ratios. I have not asked why, yet.

For illustration, I show here also the table on the basic case of [the manufacturing industry, all sizes, and v18>0] for [receivable (d^4_t) = f (payable (d^5_t), inventory (d^6_t))] ([IV-5-1]). For example, in the table on change in composition ratios the Average T of payable's regression coefficient is 0.724 and t-value 45.68, and in the previous table on composition ratios are 0.542 and 44.334.

Multiple Regressions: $d^4_t = f(d^5_t, d^6_t)$ Manufacturing, All Firm Sizes, Type A (v18>0)

	payable (d^5_t)		inventory (d^6_t)		
	coefficient	t-value	coefficient	t-value	Adj R-square
199401	0.789	44.68	−0.396	−13.87	0.273
199402	0.881	58.54	−0.569	−26.41	0.394
199403	0.817	73.60	−0.423	−22.94	0.520
199404	1.006	67.85	−0.542	−25.66	0.473
199501	0.815	54.76	−0.514	−20.78	0.365
199502	0.728	51.72	−0.435	−17.24	0.341
199503	0.523	39.82	−0.432	−20.95	0.251
199504	0.717	47.71	−0.608	−28.58	0.432
199601	0.699	52.25	−0.601	−23.61	0.368
199602	0.817	57.97	−0.363	−14.82	0.404
199603	0.725	47.43	−0.403	−19.09	0.329
199604	0.849	54.80	−0.575	−26.33	0.420
199701	0.728	49.43	−0.480	−20.35	0.339
199702	0.599	37.40	−0.353	−16.24	0.228
199703	0.636	39.89	−0.309	−14.07	0.258
199704	0.792	49.78	−0.577	−26.74	0.395
199801	0.818	49.93	−0.543	−22.12	0.349
199802	0.623	39.03	−0.305	−12.74	0.247
199803	1.011	56.82	−0.410	−17.46	0.406
199804	0.954	93.01	−0.559	−27.31	0.675
199901	0.683	48.43	−0.316	−13.74	0.326
199902	0.657	43.71	−0.290	−15.86	0.290
199903	0.705	42.00	−0.320	−10.89	0.274
199904	0.566	41.35	−0.561	−24.83	0.330
200001	0.899	42.23	−0.381	−16.03	0.280
200002	0.747	44.52	−0.326	−13.00	0.303
200003	0.436	33.78	−0.324	−16.76	0.205
200004	0.453	31.47	−0.584	−26.98	0.277
200101	−0.062	−1.50	−0.299	−4.76	0.006
200102	0.808	46.34	−0.438	−15.80	0.326
200103	1.270	124.55	−0.555	−24.58	0.781
200104	0.835	48.83	−0.652	−30.97	0.414
200201	0.750	42.50	−0.469	−20.37	0.312
200202	0.722	44.18	−0.330	−13.62	0.310
200203	0.690	43.09	−0.294	−26.72	0.320
200204	0.717	44.14	−0.582	−26.47	0.367
200301	0.690	21.33	−0.524	−11.16	0.110
200302	0.635	35.70	−0.279	−10.25	0.235
200303	0.732	41.20	0.059	3.02	0.313
200304	0.805	35.28	−0.675	−23.77	0.305
200401	0.799	48.16	−0.330	−14.90	0.359
200402	0.667	39.24	−0.353	−14.21	0.273
200403	0.677	43.47	−0.275	−13.39	0.316
200404	0.763	40.39	−0.751	−28.96	0.357
200501	0.735	42.45	−0.448	−18.59	0.316
200502	0.581	30.99	−0.464	−17.43	0.206
200503	0.725	43.31	−0.577	−21.94	0.346
200504	0.771	42.88	−0.595	−25.48	0.358
200601	0.678	45.72	−0.355	−13.38	0.345
200602	0.494	30.33	−0.251	−11.33	0.196
200603	0.692	40.35	−0.354	−14.82	0.299
200604	0.708	38.18	−0.488	−21.35	0.320
200701	0.615	30.21	−0.401	−15.31	0.204
200702	0.697	36.47	−0.375	−13.12	0.264
200703	0.574	30.97	−0.441	−18.51	0.224
200704	0.746	40.08	−0.544	−21.03	0.338
200801	0.893	60.95	−0.486	−18.00	0.499
200802	0.633	36.75	−0.387	−16.55	0.273
200803	0.816	48.03	−0.416	−18.34	0.388
200804	0.782	50.06	−0.577	−19.89	0.416
200901	0.805	46.05	−0.472	−17.68	0.375
200902	0.795	47.53	−0.522	−19.42	0.397
Average 1	0.735	50.38	−0.451	−19.73	0.352
Average 2	0.713	40.67	−0.432	−17.43	0.311
Average T	0.724	45.68	−0.442	−18.62	0.333
Av,1 − Av.2	0.022	9.71	−0.019	−2.30	0.041

[I&S-8]. Interesting Observations

At the opening of [I&S-2], I wrote as follows.

> The conventional wisdom that financial institutions, big banks in particular, have dominated the Japanese financial market and played there the key roles has long been an obvious basic assumption in research and policy debate over the Japanese financial phenomena. First, this research begins with pointing out that this conventional wisdom is and has been a misunderstanding and misconception, a myth fatally deviating from the reality. Consequently, from the start to the end, the content of this research has a wide variety of and grave implications both to research and policy discussion on financial market issues.
>
> Among the sectors obtaining funds from the market, corporate sector, therefore firms, small businesses in particular, has gathered the greatest interest both of the researchers and policy makers. Second, at least partly because of the stable dominance of the conventional wisdom as a foundation in research and policy debate in Japan, CEStat, CEQStat in particular, that provides relevant statistical information by far of the best quality, has rarely been used effectively in research on financial phenomena or policy debate. It is extremely productive to show in detail that active use of CEStat, its firm-level data in particular, is effective in escaping from confusion, chaos, and calamity based on the misconceptions. In light of the predominance of the conventional wisdom in Japan, this second point might be the most basic message of this research.

Upon those two basic points, this research conducts a full-fledged organization of basic information about financing behavior of Japanese firms, small businesses in particular, critically reviewing the dominant view or the conventional wisdom about related issues.

As a consequence of the basic character, this research directly draws few clear "conclusions", and it does not fit in so easily with "summary". Instead, I list below points and observations that I found on the process of the study and still remain impressive and interesting to me at its close, which I believe useful for readers in understanding behavior of Japanese firms, small businesses in particular, organized in the report.

(1) Even when we focus only on financing (and asset allocation), the behavior of firms in Japan ranges widely. Together with "representative figures" obtainable also from summary statistics published as the result of CEStat (CEAStat and CEQStat)

surveys, particularly for understanding the reality of great diversity in Japanese firms we should promote mote active utilization of firm-level data from those statistics.

(2) In light of the low bank dependence ratio (much lower than the conventional wisdom has argued), the relationship between bank's lending- and firm's borrowing behavior is by far remoter than has been widely assumed. The analytical method, that has been a foundation of the conventional wisdom, adopts the information about bank's lending behavior as a good substitute of firm's borrowing behavior, implicitly assuming either one-to-one correspondence or virtual integration. It has been a source of misunderstanding and a cause of big trouble. Examination of firm's financing and asset allocation behavior, too, must be conducted upon exact reality of examination objects.

(3) With the exception of listed firms for which security filings are available, CEStat is about the only source that provides good statistical information about firms including small businesses in Japan. Nevertheless, CEStat including the published summary statistics has rarely been utilized in research and policy debate on financial phenomena and finance related policies including small business policies. As a result, the conventional wisdom that has been a foundation of those research and policies is a misconception, misunderstanding, or a myth substantially deviating from the reality. Not only such a situation has been left as it is but also it has faced with few serious challenge or sense of crisis.

(4) The evil of above point (3) is particularly serious concerning small business. In Japan, small businesses have received special treatment in a world of this "myth". Recent heated policy discussion (or fiasco) over the "bank's reluctance to small business lending" and rapid expansion of related policies are symbolic. Unsurprisingly, neither coherent logical explanation nor persuasive evidence is presented.

(5) What is the most surprising and impressive in this research is the Japanese firm's low bank (to be precise, financial institutions) dependence ratio, the ratio of bank borrowing, short-term borrowing in particular, to total asset: Even in the 1960s the bank dependence ratio was by far lower than has been argued by the conventional wisdom, and since then it has consistently decreased to the present. I think it appropriate to call it "'low bank dependence' and 'further increase in independence of firms from banks'". I was deeply surprised to find that this "increase in independence" has accelerated under the ultra-easy credit policy under "zero-lending-rate" in the 2000s and that these "low bank dependence ratio" and

"further increase in independence from banks" have been more prominent among small businesses than among ultra-big excellent companies that are alleged to be advantageous in making access to international capital market.

(6) With the sole exception of receivable-payable relations (stable high positive correlation coefficient is symbolic), the study of inter-relations among composition variables such as short-term borrowing, long-term borrowing, deposit, receivable, payable, and inventory shows no noteworthy strong relation. Moreover, it is impressive that such inter-relationship is observed stably throughout the study period. No long-term changing trend is observed. No prominent change is observed during the "Credit Crunch" in 1997-1999 and the "financial crisis" of 2007, either.

(7) The above point (6) with little modification applies also to the study of inter-relations among changes in composition ratios. I expected to find prominent phenomena that had emerged in response to "outside shocks" during the "Credit Crunch" in 1997-1999 or in the "financial crisis" of 2007, which would be useful in understanding the inter-relations among changes in composition ratios. Unfortunately, however, no such prominent phenomena recognized to be a sign of those shocks. Of the points (6) and (7), I was more deeply surprised at the stability of inter-relations among changes in composition ratios.

(8) Concerning any of short-term borrowing, long-term borrowing, and total borrowing (sum of short-term- and long-term borrowing), there is no close relationship with other financial variables studied in this research. For example, there is no observation that suggests an often claimed relation that firms finding difficulty in obtaining bank borrowing actively use payables as its alternative funding source.

(9) We have only extremely poor information about trade credit, both detailed basic information and explanations on its transaction. Under such a situation, the view that "trade credit is used primarily for inventory finance" has been accepted as the conventional wisdom. This view, however, is obscure and vague, whose substance is almost completely unclear. Investigation on the basis of CEStat shows that, whatever the interpretation, this conventional wisdom is not supported by the data.

(10) Of inter-relationships among receivable, payable, and inventory, the relation between receivable and payable is strong and stable, but the one between inventory and receivable or payable is neither strong nor stable. The conventional wisdom has long argued, "trade credit is the means for large companies that enjoy advantages in bank borrowing to supply credit to small businesses". Data from the CEStat do not support this view, either in the study period of FY1994-FY2009 or in

several decades since the 1960s.

(11)   The research covers the period when the financial market since the burst of "Bubble" has been roller-coaster and a series of close encounters with new unknown phenomena. Observers consistently criticized that the various troubles and slow response in related policies have been an important cause of the "Lost Two Decades". On various fronts I was often surprised at a weak (or no) correspondence between observations drawn from data and the widely accepted "facts". Most symbolically, I find not serious impact of the "Credit Crunch" in 1997-1999 on firm's financing behavior, including that of the impact of actual collapse of several financial institutions which had been alleged to be so grave.

(12)   Heated discussion and prominent expansion of small business policies symbolizes the Japanese economy during the past two decades since the bust of "Bubble", the so-called "Lost Two Decades". Emphasizing the seriousness of "banks' reluctance to small business lend" and its decisive importance to the Japanese economy, the Japanese government expanded small business policies on a historically unprecedented scale and scope, at the center of which is the "credit guarantee policy". In none of its necessity, importance as policy issue, and effectiveness and efficiency of the policy that ensures its continuous implementation, either coherent logical explanation or persuasive evidence is available. It is not easy to draw grounds to support any of them from the study of firm's financing (asset allocation) behavior using firm-level data from the CEQStat.

[I&S-9]. Appendix: Abstracts of DI1~DP4

[I&S-9-1] Abstract of DP1

"The Low 'Bank-Dependence Ratio' and Recent Further Increase in the 'Independence of Firms from Banks'" (DP1, Miwa [2010d])

This is the first of the 4 discussion papers that, together with the Introduction and Summary paper (Miwa, 2010c), comprise the report of my recent investigation: "A Study of Financing Behavior of Japanese Firms with Firm-Level Data from the *Corporate Enterprise Quarterly Statistics* – 1994~2009".

A basic premise to most studies of Japanese financial phenomena has been the dominant role played by banks. Hoshi and Kashyap [2001, p.310] wrote that banks "were the only game in town". Observers argue that this bank dominance continued even after the "financial liberalization" of the 1980s, through which the largest firms obtained access to international capital market.

Using firm-level financial data from the *Hojin Kigyo Tokei Kiho* (Corporate Enterprise Quarterly Statistics) of the Ministry of Finance, I find that the ratio of zero-short-term-borrowing firms is highest, 50% in 1998 and two-thirds in 2008, among the smallest firms. I also find the average (short-term bank borrowing)/(total asset) ratio was lowest among these firms. Much the same phenomena characterize the patterns of long-term-borrowing ratio. Under the "zero-interest-rate, quantity easing" monetary policy, the low "bank dependence ratio" among firms fell further.

Using annual financial data from *Corporate Enterprise Annual Statistics* since the 1960s, I also show that even in the 1960s the bank-dependence ratio was lower than commonly perceived. Since then, it has declined consistently.

Those findings constitute a fundamental challenge to the conventional wisdom about the financial market and financial regulation in Japan.

"The Reality of Short-term Shocks like the 'Credit Crunch' of 1997-1999 and the 'Financial Crisis' of 2007, and the Effectiveness of 'Emergency' Economic Measures – A Follow-up to Miwa [2008]" (DP1, Miwa [2010e])

This is the second of the 4 discussion papers that, together with the Introduction and Summary paper (Miwa, 2010c), comprise the report of my recent investigation: "A Study of Financing Behavior of Japanese Firms with Firm-Level Data from the *Corporate Enterprise Quarterly Statistics* – 1994~2009".

In Miwa [2008], I used quarterly financial data on about 6,000 firms with over ¥600 million in paid-in capital to question the purported success of Japanese policy toward the financial crisis and the accumulated bad loans at banks, the debate over the causes of the Lost Decade, and postwar financial regulation more generally. This paper is a follow-up to Miwa [2008]. It expands the period studied from 1994-2000 to 1994-2009, expands the focus to include much smaller firms, and redesigns the study to encompass wider issues.

Taking the basic finding reported in Miwa [2010d] into consideration, I classified firms into two groups: firms with non-zero short-term-bank-borrowing at the beginning of the term (type A), and all others (type B). Focusing on the type A firms, I control the predominant influence of zero-short-term-bank-borrowing firms, and confirm the conclusion of Miwa [2008].

In the second half of the paper, I investigate the distribution of the ratio of the amount of financial items like payables, receivables, and inventory to total assets (level variables), and the change in the amount of financial items to total assets (difference variables). Surprisingly, the distributions both in level variables and difference variables remained stable during the "Credit Crunch", the "Financial Crisis", and the "zero-interest-rate, quantity easing" monetary policy period.

[I&S-9-3] Abstract of DP3

"The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (1) Overall
Discussion and Preliminary Investigation" (DP3, Miwa [2010f])

This is the third of the 4 discussion papers that, together with the Introduction and
Summary paper (Miwa, 2010c), comprise the report of my recent investigation: "A Study
of Financing Behavior of Japanese Firms with Firm-Level Data from *Corporate
Enterprise Quarterly Statistics* – 1994~2009".

The findings in the first two discussion papers invite readers to consider "trade
credit", and ask "what were the alternative sources of financing for the firms? Did they
involve trade credit?" Some readers will recall that -- when criticized by the public and
the government for not lending more extensively -- the banks had replied that good
borrowers were not asking for money.

Because of the strength of the conventional wisdom, most researchers and
policy makers have focused on bank finance. They have neglected the place within the
financial market for other sources of funds like trade credit. This paper first reviews the
current state of discussions about trade credit (III-2). It then provides an overview of
the relationship among trade partners and banks (III-3). It uses firm-level data on trade
credit (payables and receivables) and other financial items like bank borrowings,
deposit, and inventory. Finally, it compares positive-bank-borrowing firms and
zero-bank-borrowing firms, and concludes that there is no clear and important
difference between them. In turn, this suggests that whether a firm borrowed from
banks had no bearing on whether it suffered from financial constraints.

"The Reality of Trade Credit and its Link to Bank Borrowing and Inventory: (2) Correlation Coefficients and Multiple Regressions" (DP4, Miwa [2010g])

This is the last of the 4 discussion papers that, together with the Introduction and Summary paper (Miwa, 2010c), comprise the report of my recent investigation: "A Study of Financing Behavior of Japanese Firms with Firm-Level Data from *Corporate Enterprise Quarterly Statistics* – 1994~2009".

In the third paper, I examined the place of trade credit in Japan. Here, I continue that exploration, and turn to trade credit patterns during the "Credit Crunch." I examine the correlation among various financial variables, including the ratio of specific variables to total assets (level variables), and the ratio of the change in specific variables to total assets (difference variables). The results are surprisingly stable over time, and similar between level variables and difference variables.

The only stable relation is between payables and receivables. This appears in multiple regression studies both on level variables and on difference variables -- and appears for the size and t-value of regression coefficients and adj. R squares. Moreover, the results are stable over time, and similar between level variables and difference variables.

Observers argue that Japan experienced a serious "Credit Crunch" during 1997-1999, but has avoided much of the confusion caused by the recent world-wide "financial crisis." The data I studied suggest the opposite. I find no indication of any serious "credit crunch" ten years ago, but find a drastic decrease both in payables and in receivables in firms of all sizes.

Reference（Both for the interdependence and integrity of discussion and for readers' convenience, this reference is common to all 5 discussion papers, this DPI&S and DP1~DP4）

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