Market Power and the Detrimental Effects of Competition: Evidence from the Taiwanese Banking Industry

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Abstract

A competitive price is beneficial to consumers, but an overly-competitive banking industry may be harmful to a nation's economic development in the long run (Hart and Zingales, 2014). In this study, we examine the gradual erosion of the net interest margins (NIMs) of Taiwanese banks and their relation with market shares. The empirical implications are as follows: First, firm market shares tend to have positive and significant impacts on the bank NIMs. Specifically, the credit lending market share is highly significant in affecting the level of NIMs, and its effect is stronger for the second sub-period. Second, as the focus of lending type shifted from collateralized to credit lending, a higher credit lending market share led to higher NIMs in line with Demsetz's (1973) superiority hypothesis. Lastly, for market concentration, we are unable to draw firm conclusions based on the data, hence providing little support for Bain's (1951) collusion hypothesis.

1. Introduction

In Asia, the market structures of the banking industries in many newly industrialized countries have gone through significant changes in the past decade due to the Asian financial crisis, and rapid consolidation and high net interest margins (NIMs) have been the special characteristics for the financial markets in developing countries.[1] Among other developing nations, the Taiwanese banking industry is special for its consistent low market concentration and NIMs.

A competitive price is beneficial to consumers, but an overly-competitive banking industry may be harmful to a nation's economic development in the long run (Hart and Zingales, 2014). In Taiwan, the banking industry is such a case where a fiercely competitive banking industry, combined with the previous administration's refusal to open up the border toward the Chinese government, resulted in small and unprofitable banks that are unable to compete internationally and service Taiwanese corporation's operations overseas. The increase in the number of competing commercial and retail banks was the result of the financial liberalization in 1991. In this study, we examine the gradual erosion of the NIMs of Taiwanese banks and their relationships with different market shares.

For this study, we obtain access to a comprehensive Taiwanese banking dataset. This dataset has never used in published academic papers studying the Asian banking industries. Because the time span of the database traces back to the origin of the financial liberalization in Taiwan in 1991, by conducting panel regression analysis, we are able to confirm some predictions regarding bank profitability and behavior. In addition, the Taiwanese banking industry serves as a

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[1] Demirguc-Kunt and Huizinga's (2000) empirical study finds that, for countries with underdeveloped financial systems, a move toward a more developed financial system reduces bank margins and profitability. More specifically, in developing countries, both the banks and stock markets are less developed, and the greater the development of a country's banks, the harsher is the competitive environment, the greater is the efficiency, and the lower are the bank margins and profits.

good example for this type of study because its services have been largely unchanged for the previous two decades, and the only drastic changes were the rapid growth in the number of banks in the 1990s and the shift of focus from collateralized lending to credit lending after 2001.[2] Therefore, there is little noise in analyzing the relationship between NIMs and banks' market shares.

In what follows we examine some determinates of the NIMs of banks in Taiwan (the lending rate net of the borrowing rate). We will look at these margins as affected by concepts like "market power." In this regard it is important to distinguish between types of market power and to also understand the limitations of looking solely at NIMs.

Market power, as used in the literature, often carries a pejorative connotation, e.g., the implication of collusion or coordination between sellers. This should not be the case in all instances. Patents, for example, are a temporary granting of monopoly power (or market power) to encourage invention and technological progress. The market power here is generally for a single firm and considered to be a social good.

The tension between these two interpretations can be traced primarily to Bain (1951) and Demsetz (1973). Bain found a correlation between industry concentration and firm profits, which he interpreted as meaning that industries with higher concentration had higher profits due to collusion (tacit or explicit), supporting the pejorative interpretation of the term.

Demsetz points out that, just as with patents, any innovations which lead to either superior technologies (low production costs) or superior products can lead to some firms enjoying the economics rents from their insights through individual firm (not collective) market power. His insight was that this could lead to a firm developing a higher market share and higher profits. The

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[2] This claim is discussed later in the paper.

result could then be that industry concentration rises and industry profits rise, the correlation between concentration and profits could be due to market power, but unilateral market power rewarding successful entrepreneurial competition, a desired outcome just as with the patent system.[3]

What is the likely explanation for the concentration - profits relationships found in the literature, collective market power or unilateral market power? Scherer and Ross (1990) state that this is the "main question" in empirical industrial organization in the latter part of the twentieth century. Their conclusion is that the Demsetz hypothesis "wins" the day with them saying that market "power appears to be wielded not collectively..." Although Jakubson, Jeong, Kim and Masson (2009) have a working paper which questions this (for Korean data) we will not pursue the issue in detail.

The reason for the importance of this debate to our work has to do with the distinction between market share and market concentration. Following Demsetz's work one might interpret a market share - firm profit correlation as "good" unilateral market power. An industry market concentration - industry profits correlation, however, can be due to either Bain's collusive hypothesis or Demsetz's superior firm hypothesis. So, in modeling NIMs, as functions of market shares or functions of market concentration, we have to be careful about interpretation of results. So correlations may be interesting, yet not determinative of a particular interpretation of results.

The second issue of importance is a certain limitation of looking at NIMs alone. Suppose one had identical firms and perfect competition. Suppose that it takes a dollar of deposits to make a dollar of loans. Further suppose that it costs c to convert a dollar of deposits to a dollar of

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[3] Dixit (1986) shows that with heterogeneous goods outcomes are highly dependent upon demand structures. So, for example, if Porsche comes out with a superior product it will gain higher profits and its very small share will increase, possibly eroding industry concentration. We ignore such effects.

loans. Then one would expect something like $r_{loans} = r_{deposits} + c$ where the $NIM \equiv r_{loans} - r_{deposits}$. Collective behavior could raise the NIM by creating $r_{loans} > r_{deposits} + c$. Alternative, one firm facing a lower c than its rivals might make profits while its rivals are breaking even.

To distinguish types of behavior, such as the behaviors implied by Bain or Demsetz's hypotheses one would need information not only on interest rates, but also on firm marginal costs. Without this information this study focuses on NIMs to see if shares, concentration or other factors explain these margins.

In this paper, we investigate how NIMs are affected by different types of market shares, macroeconomic variables and financial market structures, controlling for several firm-specific variables such as bank financial structures and lending practices. Then we will move on to different types of market concentration to examine the relationship between NIMs and market concentration.

2. Literature review

Recent research, as surveyed by Levine (1997), shows that the efficiency of financial intermediaries can affect economic growth. Specifically, banks affect the net returns on savings and determine the required returns on investments. In order to achieve efficiency and service corporations, banks have to be sufficiently large to achieve the economies of scales which reduce operating costs. Bank consolidation waves in Hong Kong, Korea and Japan have produced some of the largest and competitive financial institutions in the world.

In general, financial institutions may benefit from consolidation for positive reasons. First, consolidation may create economies of scale, economies of scope and managerial efficiencies which may reduce costs. Second, financial institutions can expand and enter into other segments

through consolidation, potentially lowering operating risks by further diversification. Third, consolidation may increase surviving banks' market power and induce collusion.

Berger and Hannan (1989) and Hannan (1991) study how U.S. banks in more concentrated local markets charge higher rates on corporate loans and pay lower rates on retail deposits, resulting in higher NIMs. Many papers have focused on the impacts of concentration on the degree of competition in the banking sector and bank profitability. Demirgüç-Kunt, Laeven and Levine (2004) analyzed the effects of concentration and bank regulation on U.S. bank spreads.

As for NIMs, Hanson and Rocha (1986) summarize the role that implicit and explicit taxes play in raising spreads and discuss some of the determinants of bank costs and profits, such as inflation, scale economies and market structure. The authors use aggregate interest data for 29 countries between 1975 and 1983; they find a positive correlation between NIMs and inflation.

Barth, Nolle and Rice (1997) use 1993 data from 19 industrial countries to study the impacts of banking power on bank returns on equity controlling for several bank and market characteristics. They find that variations in bank power, concentration, and the existence of explicit deposit insurance do not significantly affect the return on bank equity. However, their study does not control for many important variables that affect the base lending rates.

Kunt and Huizinga (1999) use bank-level data of 80 countries from 1988 to 1995 to show that differences in NIMs and bank profitability reflect a variety of determinants: bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure and underlying legal and institutional indicators. They find that a larger ratio of bank assets to gross domestic product and a lower market concentration ratio lead to lower margins and profits, controlling for differences in bank activity, leverage and the macroeconomic environment.

Salas and Saurina (2002) provide empirical evidence on the effects of regulatory changes on the market power of Spanish banks. They study how banks responded to regulatory changes in terms of risk-taking behavior as the result of increased competition and reduced economic profits. In addition, the study shows that industry liberalization measures have increased competition and eroded banks' market power. They also find that banks with lower charter values tend to have lower equity-assets ratios, indicating lower solvency, and they experience higher risk.

Several papers examine the effects of bank mergers and acquisitions (M&As) on prices. Mergers or consolidations increase market concentration, which increase banks' market power (by collusion, tacit or explicit) and theoretically create more unfavorable prices for customers on deposits and loans. But alternatively, banks may also reach better economies of scale and efficiency savings that may be passed on to customers. Prager and Hannan (1998) find that M&As increased local concentration in U.S. banking markets and had unfavorable price effects. Others such as Akhavein, Berger and Humphrey (1997) find mixed or insignificant effects of M&As' effects on prices in the U.S. Sapienza (2002) also finds mixed results for the Italian banking industry. Panetta and Focarelli (2003) explain that, based on their empirical research on the Italian banking sector, short-run effects of M&As may have short-run effects on prices that are unfavorable to customers, but that the long-run effects were favorable due to efficiency gains. In short, their logic is that the market power effects dominate in the short-run and the efficiency effects dominate in the long term.

Demirgüç-Kunt, Laeven and Levine (2004) examine the impact of bank regulations, concentration and national institutions on bank NIMs using data on 1400 banks across 72 countries. They control for bank-specific characteristics and macroeconomic factors. The results show that tighter regulations on bank entry, restrictions on bank activities and regulations that limit the freedom of bankers to conduct their business all boost NIMs. However, we feel that comparing the NIMs across different countries without controlling for important economic variables such as the base lending rate for banks or the discount rate set by the central bank may result in ambiguity. They find a weak positive relationship between bank margins and concentration, but the relationship becomes insignificant when controlling for institutional development.

In this literature review we find several factors influencing banking competition and NIMs. From our review of the literature, it appears to us that there are some gaps which should be explored. For example, no papers have considered the basic sources of income and lending practices - some banks may depend on account service fees as an important source of revenue. Such banks, if large, may charge lower lending rates because they are volume-based, or they may charge lower interest rates because they are trying to expand.

In terms of actual lending practices, collateralized lending is also different from credit lending. If a bank focuses on the former type of lending, such that the borrowers have assets that can be seized and liquidated in the event of default, then banks can afford to charge lower lending rates. This type of lending usually consists largely of institutional lending or mortgages. As for credit lending, because the default possibility is based on a firm or a person's credit history, a bank usually charges higher lending rates to compensate for the additional risk. If a bank focuses more on credit lending than on collateralized lending, it will have higher average lending rates, resulting

in higher NIMs, holding all else equal. To our knowledge, no paper has taken this factor into account when conducting industry analysis.

3. The Taiwanese banking industry

Before 1989, most Taiwanese banks were state-owned. In 1989, the Lee administration passed and instituted a new banking law, essentially opening up the Taiwanese banking industry to the establishment of new privately-owned banks. The policy officially came into effect in 1991 and drastically lowered the barriers to entry in the banking industry. As soon as the deregulation went underway, 13 new banks were created. Before 1991 there were only twelve banks. In 1991, the entry of 13 new banks doubled the number of banks which continued to shoot up until there were 52 banks in 2002 after which consolidation and exit saw a decline to 37 banks in 2008.

Due to the competitive banking landscape, bank profits have been decreasing since the 1990s. The continuous, decades-long decline of the NIMs has posed a serious challenge. Interest earned from banking loans to consumers and firms is still the biggest income source for banks and the decrease in NIMs directly affects banks' returns on equity (ROE). Based on the data provided by the Financial Supervisory Commission and the Central Bank in Taiwan, in 1993 the seven state-owned major banks had an average ROE of 22.90% and the domestic non-state-own average was 12.46%. In 2000, the domestic average declined to 6.19% in 2000, -6.93% in 2002, 10.30% in 2004 and 1.95% in 2006.

Recognizing the over-banking problem, the Taiwanese government began a series of actions to meet these challenges. One law that was passed was the Financial Holding Company Act. After the passage of the Financial Holding Company Act in 2001, fourteen financial holding companies were established, owning banks, insurers or securities firms. The government

purposefully allowed the creation of such powerful financial conglomerates in hopes of seeing accelerated consolidation in the banking industry. However, the passage of the act did not facilitate the banking industry consolidation to an ideal level. After eight years, there are still 37 banks in Taiwan as of 2009, far too many when compared with other Asian countries such as Hong Kong, Singapore, Japan and South Korea. In these countries, the total assets market share of the three largest banks was 63% in South Korea, 83% in Hong Kong, 72% in Singapore, 68% in Australia, but only 16% in Taiwan (Hwang and Wu, 2007) . Moreover, the state-owned banks continued to hold the majority market shares in Taiwan. These banks lack international competitiveness in terms of service qualities and product offerings, and a privatization of these state-owned banks would be necessary for these banks to get stronger market positions and increase the competitiveness in both domestic and international markets.

At the beginning of the millennium, pressured by the low profitability, banks began to focus on credit lending and offer innovative products. Products like the cash cards (many stores do not allow credit-card purchases in Taiwan), credit cards and collateralized debt obligations became popular. Because the lending amount is relatively small for each consumer, banks could charge higher lending rates.

4. Data and methodology

4.1. Data

Two databases owned by the National Taiwan University are used. One database includes the monthly data on the operational information such as bank lending rates, bank deposit rates, the deposit market shares, lending, depositing amounts and etc. The other database extracts the information from banks' quarterly filings; it has the basic performance measures, profitability and

cost structure on a quarterly basis. The frequencies of these two databases are different such that the data extracted from the quarterly reports have only four observations for a bank per year, whereas the other database has twelve observations. If only quarterly data is used, some monthly data would be sacrificed. To utilize all available information, we replace the missing values based on the information available at the last observation. Aside from the above adjustments, there are no other modifications done to the datasets.

Over 400 variables are identified in the combined dataset, and the most important ones are chosen to construct the regression model. Moreover, aside from the high frequency and long length of data, this study is also unique in that it includes many control variables. The control variables include a comprehensive set of bank characteristics such as size, leverage and lending practices, macroeconomic indicators and financial market structure. As discussed earlier, the Taiwanese financial industry was largely stale before 1991. In this study, we use observations between 1991 and 2009 and end up with 5081 observations in total.

4.2. Empirical model and variables

This paper uses panel data regression with fixed effects to analyze the impacts of various types of market shares on bank NIMs. The pricing power is conventionally defined as the net interest margin, also called the bank spread. This study controls for a host of bank characteristics and macroeconomic variables by estimating regressions of the following form (base model):

$$NIM_{i,t} = \alpha_{0i} + \alpha_1 Debt\ to\ Assets\ Ratio_{i,t} + \alpha_2 NPL\ Percentage_{i,t}$$
$$+ \alpha_3 Service\ to\ Interest\ Income\ Ratio_{i,t}$$
$$+ \alpha_4 Administrative\ Cost\ Percentage_{i,t} + \alpha_5 Discount\ Rate_t$$
$$+ \alpha_6 Base\ Lending\ Rate_t + \alpha_7 Market\ Share_{i,t} + \alpha_8 Liquid\ Ratio_{i,t} + \epsilon_{i,t}.$$

where i is the bank ID, t refers to the time period considered in monthly frequency. Equation (1) is motivated by the dealership model of bank spreads developed by Ho and Saunders (1981), extended by Allen (1988), Angbazo (1997) and others, and the firm theoretical framework developed by Zarruck (1989) and Wong (1997). The two models predict how operating costs, regulatory costs, credit risks and market structure can affect interest spreads. Their models are modified in this paper, and we use ex ante NIMs whereas they use ex post NIMs.

The NIM is the difference between the weighted-average lending rate of the month, which is defined as the ex ante weighted-average contractual lending rates and weighted-average lending rate on new loans, and the average deposit rate of the month, which is defined as the ex ante weighted-average contractual deposit rates and weighted-average lending rate on new deposits.

The debt-to-asset ratio is the ratio of total debt (bank liabilities) to total assets. Buser, Chen and Kane (1981) examine the theoretical relationship between bank profitability and bank capitalization. Banks that have high levels of liabilities compared with their equity would have higher incentives to get better-capitalized and engage in more prudent lending behavior, causing lower NIMs. In the 1990s, Berger (1995b) shows that U.S. banks have a positive relationship between bank profitability and capitalization. Banks that are well-capitalized also face lower expected bankruptcy costs for themselves and their customers, and they are able to engage in more profitable (riskier) lending practices.

The administrative cost refers to the ratio of administrative expenses to average assets. Banks which incur higher administrative costs per unit of business may have higher marginal costs of lending and in equilibrium some or all of the difference in marginal costs may be passed on in terms of greater NIMs.

The NPL percentage is the ratio of non-performing loans to total loans. Non-performing loans include the preexisting and current NPLs. NPLs typically only stay on a bank's balance sheet for a couple years, and then are written down at the discretion of bank managers or partially recovered by collection agencies. This variable captures the credit risk imbedded in the preexisting bank portfolio, which may likely affect the bank's attitude toward future risks and types of customers. This variable is often included in the literature, but it is especially important since we are using ex ante NIMs. The NPL in this case captures the differing portfolio risks. Specifically, banks will charge higher rates of interest on riskier loans so banks with riskier loans and facing similarly riskier loans in the future will have higher average NIMs.

The discount rate is the government's marginal lending rate to banks, and it is set by the central bank. It is a fixed rate for banks to borrow money from the central bank. It is also called the interest rate for "discount window lending." The discount rate has not been studied much in the literature on bank spreads, but it represents a cost for the banks to borrow money from the central bank. Banks may be incentivized to pursue more deposits if liquidity is needed by paying more for them in the form of higher deposit interest rates, which may have a negative impact on NIMs. In equilibrium a bank may want to hold these safer assets because of having higher risk loans and wanting to balance those in its portfolio.

The base lending rate is targeted by the central bank. This interest rate is also known as the "federal funds rate," and it is the shot-term rate at which the banks lend to each other. It is also known as the minimum lending rate and serves as the basis for debtors to refinance loans, meaning that a higher base lending rate should have a positive relationship with the NIMs.

The liquid ratio is measured as the ratio of liquid assets to total assets. Liquid assets include cash and deposit balances in other banks, including reserve requirements at the central

bank. A high liquidity ratio, whether self-imposed or required by regulatory authority, inflicts a cost on banks since they have liquid assets on their balance sheets that can be reallocated to less-liquid but higher-return assets.

Four different kinds of market shares are used. There are the average monthly deposit market share, the bank branch market share (out of total branches in the country), credit lending market share and collateralized lending market share. The first two are concerned with the absolute bank size in the industry, and the latter two address the bank lending practices. The average monthly deposit market share is the market share of the total deposits a bank has in the financial market. Bank branch market share is self-explanatory, though not often used in the literature. The bank branch market share is important in Taiwan since online banking is not yet prevalent in Taiwan, and most customers have to go to a physical location to receive banking services. Credit lending and collateralized lending market shares are the market shares of how much credit loans and collateralized loans a bank makes in a month. To our knowledge, these two explanatory variables have never been used in the literature. Table 1 summarized the representative statistics of our sample.

[Insert Table 1 about here.]

4.3. Net interest margin and profitability

This study uses ex-ante interest spreads. The ex-ante spread is the difference between the contractual rates charged on loans and rates paid on deposits. It is appropriate in our context to use the ex-ante NIMs because this study examines the pricing power of banks. In the literature, researchers usually use ex-post NIMs, which is the spread between banks' actual interest revenue and their actual interest expense. The reason is that ex-ante spreads are generally only available at

the aggregate industry level and are put together from a variety of sources. In this study, we are able to obtain historical ex-ante data at the firm level.

Again, most papers use ex-post spreads because the ex-ante spreads, determined by contractual agreements, are not available. The ex-post spread is the difference between the implicit average interest charged on loans and the implicit average interest paid on deposits. The spread is calculated by taking the total quarterly interest received divided by the average loans for the period less the total interest paid on deposits divided by average deposits. But the ex post spread in reality does not represent the pricing power of banks. There are several shortcomings. First, the interest received by a bank already incorporates default risks – when a debtor defaults, a bank does not receive interest. A debtor would not have lower default risk because the lender has more market share or because the banking industry is more or less concentrated. Second, the interest rate received by a bank during the quarter does not represent the bank's pricing power – the bank can be receiving interest this quarter from a loan made years ago.

5. Empirical results

5.1. Limitations of net interest margin

Before we get to the empirical results, we must first discuss the limitations of looking only at NIMs. As mentioned earlier, by using market shares, we are examining whether banks benefit as described by Demsetz's "superiority" hypothesis. There are two sides when looking at a firm's superiority – the cost side and the demand side.

On the cost side, the concept can be illustrated by a simple Bertrand model. First, assume there are 100 buyers of one unit each. Each buyer has value of $1.00 for a unit with no service and $1.10 for a unit with service. Assume constant returns to scale and that all sellers (banks) have

marginal cost of $c_i = c = \$0.25$ for the product and of si = infinity for the service added to any unit. And assume that N is large.

In a symmetric Bertrand game, $P = MC$ implies that $P = \$0.25$. It is conventional but not necessary to assume that each firm sells $100/N$ units. Clearly, P not only equals MC, but $P = AC$, and the profits are zero.

Now, assume a firm learns how to produce units at $MC < \$0.25$, say $MC = \$0.20$. It will charge a price equal to its rival's MCs minus epsilon (price differences) and get the entire market. To keep things simple, call the innovating firm, firm 1, and suppose that epsilon were a penny, $\$0.01$. Then price falls to $P = \$0.24$ and firm 1 share goes to 100%, the entire market. Note that the price of firm 1 falls as its share goes up (and it is conventional to say that all other firms remain in the market at price $\$0.25$ and shares $= 0$). The apparent "margin" in terms of price falls. Or maybe put another way, the margin relative to MC, where MC is defined as pre-innovation MC has fallen from $\$0.00$ to $-\$0.01$ (a negative margin). The problem here is that the true margin has gone up from $\$0.00$ to $\$0.04$ for the superior firm. To put into the context of this paper, we need to observe not only P (the lending rate) over time but also ci (the lending cost) over time. This is the problem with looking at NIMs, they are pure prices, and do not reflect costs and cost changes over time. Therefore, in this paper, results obtained from the regression do not examine the cost side of the superiority hypothesis. But one can predict that if a bank does attain a cost advantage, then as the bank gains share, the NIMs go down.

As for the demand side of the superiority hypothesis, we can illustrate some issues using a particular set of preferences. This is a game in which consumers have preferences between sellers. In particular these preferences are not at all like Hoetelling preferences (a much harder model) or

like Chamberlin's symmetric differentiation. They are simply that some consumers happen to like any seller who offers one unit of s per sale to all others if the prices are identical.

Now again suppose firm 1 is a superior firm and learns how to add a unit of service to its product for $s_1 = \$0.05$ (a nickel). It could choose to not offer service, and earn zero profits and have a share of $100/N$. But it could offer service. Service is worth $0.10 to half the population. To avoid epsilons, suppose that if sellers $2, \cdots, N$ are selling at $P = \$0.25$, that firm 1 can capture the service folks at $\$0.25 + \$0.09$ (nine cent premium, rather than a $0.999 premium reflecting an epsilon below $\$0.35$).

Firm 1 now has a price of $0.34 and earns unobservable profits of $(0.09 - 0.05) \times 50 = \$2.00$ and its share increases to 50% of the market. Firms $2, \cdots, N$ still charge a price of 0.25 in equilibrium and following convention each now has a share of $50/N$.

What one can observe, without seeing costs, is that the average price of product goes from $0.25 to $0.295 (using industry data) and firm 1's price goes from $0.25 to $0.34 using firm data. One cannot observe the superiority rents (market power) due to the fact that marginal costs, with and without service, are unobservable. (Note that although firm 1's price goes up by $0.09, its margin only goes up by $0.04, but one can't see this if costs are unobservable).

Here the superiority leads to a higher observed price (NIMs) for firm 1 because the superiority is on the demand side, not the cost side. This is a story in which market share and NIMs are positively correlated. So, cost side superiority leads to firm shares associated with lower firm NIMs and demand side superiority to firm shares associated with higher NIMs. In what follows we find that NIMs are related to shares as would be expected in a demand superiority model, not like they would be in a cost superiority model.

5.2. Average monthly deposit market share and branch market share

In spread estimations such as Peria and Mody (2004), authors usually make some assumptions in the panel regression analysis. First, they assume there are no structural shifts in the relation between bank spreads and their determinants, and second, they ignore possible common shocks or time trends. In this paper, we divide the time horizon into two sub-periods. The first period is from year 1991 to 2000. This is because the first financial reform began in 2001 and worsened the situation; it induced the banks to engage in fierce competition for depositors by lowering the collateralized lending rate. They wanted to get bigger in order to avoid being acquired and absorbed by competitors. Therefore, after 2001 one may expect the deposit market share to have a negative impact on NIMs because the kind of market share was earned by lowering the NIMs. Since the consolidation progressed quite slowly, this price war became a continuous practice, causing Taiwanese banks to have the lowest profitability in Asia. The sub-periods are a unique aspect of this study. By doing so, we can capture the structural shifts of the industry and conduct analysis without assuming there were not structural shifts, common shocks or time trends.

[Insert Table 2 about here.]

Tables 2, 3 and 4 report the results of panel regressions based on the first two market share types. The three tables are based on three different model specifications; Table 2 is based on firm characteristics (base model), Table 3 adds control variables based on lending practice information, and Table 4 adds more control variables based on macroeconomic data.

Table 2 reports the results of the base model. Two types of market shares are included: the average monthly deposit market share and the bank branch market share. The average monthly deposit market share is measured by a bank's total deposit amount over the total deposits owned by the entire industry. The second type of market share is the bank branch market share. This proxy is rarely used, but in practice, the more branches a bank has, the more convenient it is for depositors

to engage in daily transactions. A higher bank branch market share may give a bank some power to price the loans higher since consumers may not compare the lending rates of all banks before making a borrowing decision. Also, the branch market share is important because first, depositors can sacrifice some pricing advantages for convenience, and second, a bank with a high branch market share may have a more established reputation in the marketplace, and depositors may not compare different deposit rates and go directly with large banks, implicitly ceding pricing power to the banks. Additionally, the higher a bank's branch share is, the higher the service income, which may result in a higher service income to interest income ratio. The panel regression already controls for this ratio, so if branch market share still has positive impact on NIMs, such impact may be the result of a bank's unilateral market power. With more branches, customers may find a bank more convenient and deposit their money at the bank. With the higher demand for deposits, the bank may effectively lower the deposit rates and enjoy higher NIMs. Later we will control for different lending practices to see which types of market shares directly impact the NIMs.

In Table 2, banks that have higher debt ratios have lower NIMs, and the result is economically and statistically significant and consistent across time periods. The NPL percentage, which is the non-performing-loans to total loans ratio, has a positive effects on NIMs between 2001 and 2009. Non-performing loans may be the result of risky lending. Banks generally charge higher lending rates for riskier borrowers. The NPL percentage is then a proxy for the overall risk profile of bank's lending portfolio. The results are consistent with each other and significant at 1% level when the panel regressions include all observations from 2001 to 2009. The reason why the NPL is not significant between 1991 and 2000 may be because banks mostly engaged in collateralized lending, and NPL ratio was consistently low at the time. In Taiwan, the NPL was

not a problem until banks began issuing too many credit cards and cash cards while underestimating or neglecting to monitor the default risks of the consumers.

The administrative cost is the ratio of administrative expenses to average total assets. If banks incur high administrative costs in the process of providing their services as intermediaries, given the increased marginal cost, in equilibrium this should lead to higher lending rates for some or all banks. In previous papers, including Peria and Mody (2004), this variable always has a positive impact in NIMs. However, it is interesting to note that the administrative cost has different effects in different time periods in my sample. Overall, the administrative cost has a positive effect on NIMs, but between 2001 and 2009, the effect is negative. It illustrates a unique phenomenon in the Taiwanese banking industry such that banks were still expanding rapidly during the period, resulting in higher administrative cost, but they were not able to pass the expenses on to the borrowers and depositors for fear of losing market shares.

The liquid ratio is measured as the ratio of liquid assets to total assets. Liquid assets are defined as cash, deposits in other banks and excess reserves at the central bank. Excess reserves are defined as the federal deposits in excess of the required reserves. For example, a bank has a deposit of $100, and if the Federal Reserve requirement is 10%, then $10 will be the required reserve. If the bank deposits $20 at the central bank for the $100 deposit, then the $10 is the excess reserve. In the literature, high liquidity ratios are said to inflict a cost on banks since they have to give up holding higher-yielding assets. Supposedly, banks would transfer this opportunity cost to borrowers, resulting in higher spreads. In Table 2, one can see that in all samples and sub-samples except one, higher liquidity ratios do result in higher NIMs.

The average monthly market share and bank branch market share both have positive and significant impacts on NIMs for the entire sample and between 1991 and 2000. But from 2001 to

2009, the average monthly market share has a negative impact on NIMs. In Taiwan, after the first financial reform, according to Current Asian Banker Analysis's publication in 2006, banks began issuing credit cards and cash cards because they yielded higher interests. Gradually, banks' operations became largely focused on credit lending. The fact that the average monthly market share has a negative impact from 2001 to 2009 may potentially be attributed to the changing lending practice from collateralized lending to credit lending. As Taiwanese banks became more leveraged and focused on credit lending, the deposit and branch market shares became less relevant. Following Figure 1 is a chart of the historical credit lending to total lending ratio based on National Taiwan University's database.

[Insert Figure 1 about here.]

Table 3 adds several more control variables. With these additional variables, samples and sub-sample panel regressions all have improved R-squares. This regression model includes the variables from the base model and four other variables that are related to a bank's internal operation and lending practices.

[Insert Table 3 about here.]

The loan-loss reserve is what the bank managers set aside from earnings to prepare for possible defaults. The managers have a lot of latitude in deciding how much to set aside, and this amount would be booked as expenses. If the loan-loss reserve overestimates the actual default rate, the remaining amount shows on the next year's financial statement as the loan recovery. There are several reasons why managers set aside different amounts in different years. First, if a manager feels that the bank's lending portfolio is riskier than that of the previous year, the manager will set aside a higher portion of earnings into the loan-loss reserve. The loan-loss reserve to total lending ratio is another proxy for portfolio risk. Second, managers may also set aside such funding in

preparation for a possible downturn of the financial market. Third, managers also use it as a tool for income management in order to meet analyst expectations.

Table 3 shows that the overall effect of the loan-loss reserve to total lending ratio is positive and significant. However, in subsamples, the effects are positive between 2001 and 2009 and negative between 1991 and 2000. As mentioned above, Taiwanese banks mostly engaged in collateralized lending in the early years of deregulation, and future cash flows from collateralized lending were more predictable. The bank managers may have been setting aside money for a possible financial downturn instead of using the loan-loss reserve as a risk management tool.

As for the total asset growth rate, given that the shareholders' equity at book does not fluctuate greatly from year to year, the total assets growth mainly reflects an increase in deposits. A bank that is growing in deposits would have more room for profitable but riskier lending. The overall effect of the total asset growth rate is positive and significant for all samples.

The lending to deposit ratio is the total lending to the total deposit ratio. The lending to deposit ratio has the same effect on the bank lending practices as the debt-to-asset ratio. If a bank's deposits are low compared to what the bank has lent out, then a bank would be forced to engage in more prudent lending practices, avoiding higher risk borrowers. Table 3 shows that the lending to deposit ratio has a negative and significant effect on NIMs, indicating that banks with higher ratios make loans at lower NIMs across all periods.

[Insert Table 4 about here.]

Table 4 includes additional variables based on macroeconomic data. For the third model specification, we incorporate the total bank assets as an indicator of market structure and scale effects. The total bank assets to GDP ratio is a proxy for the banking industry's power in the country. If the ratio is large, it means that the banking industry is more powerful in the country. In

the panel regression analysis, we get positive and significant results for all samples except for monthly average deposit market share from 1991 to 2000. It means that the banking industry is able to impose higher NIMs as it becomes larger relative to the country's economy.

As discussed, the lending to deposit ratio serves the same purpose as the debt to assets ratio from a different perspective. The results are significant across all time periods, indicating that if the pre-established loan portfolio causes a higher lending to deposit ratio, the managers will engage in more prudent lending practices, causing a lower average NIM.

The annual GDP growth rate provides inconclusive results. A central bank tends to raise interest rates during a bull market to fight inflation, and banks follow suit to raise their lending rates. As a result, banks usually experience high NIMs when the GDP growth rate is high. Of course, to attract more deposits to fuel a bank's lending activity, it has to raise the deposit rate eventually. But there is usually a lag between the raising of the lending rate and the raising of the deposit interest rate, and Table 4's inconclusive results may be a result of this lag.

The average monthly deposit market share yields significant results consistent with the previous two model specifications, and the branch market share's aggregate sample result is significant and consistent as well. However, the subsamples' results are insignificant in this model specification. Moreover, this specification is not better than the second one based on the R-square, since the R-squares are all lower than those of the second model specification.

Based on the above results, we can see that the deposit market shares and branch market shares overall are positively correlated with banks' NIMs. But the coefficients become negative between 2001-2009. It indicates that the absolute size and the number of branches do not provide a bank with an advantage during this period. Interpreting the results from the demand side of the superiority hypothesis, bank sizes (the level of deposits and the number of physical locations)

allow the banks to enjoy greater demands during 1991-2000, pushing up the NIMs. This advantage may be attributed to superior convenience to the depositors or more popular choices for borrowers (a popular bank may have been the first place to go to obtain loans). During 2001-2009, the above advantages may disappear as many banks have a higher number of branches, borrowers have easier access to bank lending information, and collateralized lending became less profitable for banks due to the increasing competition.

5.3. Credit lending and collateralized lending market shares

This section includes the regression results based on the other two types of market shares, credit lending market share and collateralized lending market share. They each represent different types of lending and are used not only as unilateral market power proxies but also to capture the structural shift in the Taiwanese banking industry. Here we again make the distinction between the collusive firms and the superiority hypotheses. Market shares are distinct from concentration. By examining market shares, we see whether banks seem to have higher pricing advantage due to having a degree of superiority in their product offerings. Based on these two proxies, we conduct panel regression analyses based on the previous three model specifications to determine whether the regressions yield consistent results. Since credit lending market share and collateralized market share are explanatory variables, the credit lending to collateralized lending ratio is excluded from the variable list.

[Insert Table 5 about here.]

In Table 5, the regression results indicate consistent implications with those of the base model regression using the monthly average deposit market share and branch market share. The market shares of credit lending and collateralized lending are important factors that affect the NIMs.

First, the credit lending market share is highly significant in affecting the level of NIMs, and its effect is stronger for the second sub-period. As discussed earlier, the lending practice shifted from collateralized to credit lending, and the results here indicate this shift as well. The results show that, given this shift, in the second sub-period one can see that a bank's credit lending market share gives greater power to a bank to charge higher NIMs. Second, credit card or cash card products are mostly homogeneous since they are just small credit loans in nature, so a relatively popular cash card or credit card may induce potential customers to apply, raising the demand and resulting in higher lending rates.

The collateralized lending market share, on the other hand, has significant impacts between 1999 and 2000, but it loses its significance from 2001 to 2009. This implies that the Taiwanese banks strayed away from safer lending practices (making loans based on collateral) and let the profitability be driven by credit loans. Without proper risk monitoring, given that the result of credit loans are much harder to predict than collateralized loans, the banks faced the danger of higher default rates if hit by an economic slump, which did happen in 2004.

In addition, the R-squares for the period between 1991 and 2000 are much higher than for the period between 2001 and 2009, showing that the model specification works much better in the early years of the financial liberalization. After the market became saturated in the beginning of the millennium, the gradual reduction in the number of banks had not helped the banks resuscitate their profitability; the competition is still fierce. The gradual, and continuing reduction in the number of banks is mostly a result of unprofitable banks becoming insolvent and exiting the industry through acquisitions by other larger banks.

There is a dramatic period-to-period change in the statistical significance of the service income to total income ratio. As discussed earlier, banks may charge higher lending rates if they

have a higher portion of income coming from service fees, and the results are highly significant in the period of 1991-2000. But the variable experiences a drop in significance for 2001-2009.

[Insert Table 6 about here.]

Table 6 is based on the second model specification. The R-squares are improved with additional bank information as they were previously. For the period between 1991 and 2000, the R-squares are as high as 0.76, indicating a very high predictive power. The two market shares yield consistent results as before.

[Insert Table 7 about here.]

Table 7 is based on the third model specification, and it shows consistent results. However, it does not exhibit higher R-squares as before. One potential reason is that the credit lending market share may not be important to demand side superiority. For example, when one owns a mortgage, it is not necessary to visit the bank frequently. For daily transactions, he may use another bank and visit the bank's branches often. So demand superiority based on locational convenience may only be based on deposits, and not on loans.

The GDP annual growth rate still exhibits a negative relationship with the NIMs in the period between 1991 and 2000 and positive in the period between 2001 and 2009. Typically, the GDP growth should be positively related to NIMs because the central bank tends to raise interest rate to combat inflation, but our data does not show that higher GDP growth is accompanied by higher NIMs.

The market stock cap to the quarterly GDP ratio represents the strength of the capital market. The regression from the overall sample indicates that if the market index, which consists of the largest corporations in the country, is performing strongly relatively to the nation's GDP, it has negative impacts on NIMs. In subsamples, the effect is positive during 1991 to 2000 and it has

a negative impact during 2001 to 2009. Usually, a strong growth prospect (indicated by a high stock-cap-to-GDP ratio) should increase demand for loans, driving up lending rates. But based on our data, the results are inconclusive.

Based on the above results, we can see that collateralized lending market shares cease to give banks advantages such that higher collateralized market shares do not drive up NIMs during 2001-2009. After 2001, credit lending becomes more crucial for banks' profitability, and if a bank can produce popular credit cards or cash cards (small credit loans), their popularity may drive up demand for loans and raise the bank's NIMs. This also provides support for Demsetz's superiority hypothesis when the changing lending practice is taken into account.

5.4. Market concentration

In this section, we examine the correlations between NIMs and different types of market concentration. The market concentrations used in this paper are Herfindahl indices, calculated as the sum of squared market shares of each bank. As discussed earlier, we are trying to examine the correlations between NIMs and their determinants. Only a general discussion of the results is included, but all relevant tables are provided in the appendix for references in Table 8 through Table 13.

[Insert Table 8 about here.]

[Insert Table 9 about here.]

Overall, the regression results are inconclusive and provide little support for Bain's collusion hypothesis. The coefficients across different model specifications and time periods are unstable. The coefficients of different concentration measures yield opposite but significant results. For example, in Table 8 and 9, the market branch Herfindahl index for the overall period yielded significant results, but the coefficients have opposite signs for the first two model specifications

(negative and then positive). Table 10 then yields a negative and significant coefficient for the overall period.

[Insert Table 10 about here.]

When we turn to the Herfindahl indices for credit lending and collateralized lending, the results are more consistent. Both types of Herfindahl indices in Table 11-13 indicate that for the overall period and the first period (1991-2000), there is evidence of collusion based on the data such that higher market concentrations lead to higher NIMs. But this effect disappeared during 2001 to 2009 such that higher market concentration for both types of lending leads to lower NIMs. As discussed earlier, this is a period of fierce pricing wars and industry consolidation, and the result may potentially be attributed to the rapid erosion of NIMs among banks. In other words, during this period, the Herfindahl indices became higher but NIMs continued to drop. This may yield a negative correlation between the Herfindahl indices and NIMs during the period. It also does not provide support for Bain's collusion hypothesis.

[Insert Table 11 about here.]

[Insert Table 12 about here.]

[Insert Table 13 about here.]

A potential reason for some of the inconclusive results for Table 8-10 may be caused by the overall low concentration of the Taiwanese banking industry. As mentioned earlier, the top 3 banks in Taiwan only sum up to less than 20% market share. Based on general findings using Herfindahl indices (Geithman, Marvel and Weiss, 1981), if the top four (top eight firms) firms' market shares sum up to less than 50% (70%) the derivative of profits with respect to concentration is essential zero. This means that any meaningful results would have to come from data sets which have higher concentration.

Furthermore, based on Taiwan's Financial Supervisory Commission's report, out of the top 10 banks in Taiwan, nine are government-owned or the government has the majority shares. It is quite possible that government banks are not likely to be collusive between each other or with private sector rivals, and government banks should not set prices to maximize profits but should maximize the consumer welfare and break even. Therefore, efficiency and unilateral market power may affect the NIMs, while market concentration may not affect them.

6. Conclusions

As discussed in the beginning of this paper, too many banks entered the market during the 1990s, and the competition became fierce as the government began to encourage an industry-wide consolidation. Banks were eager to gain market share by offering higher deposit rates and lower lending rates, resulting in the lowest industry NIMs in Asia.

The overall results show that firm market shares tend to have positive and significant impacts on the bank NIMs. Specifically, the credit lending market share is highly significant in affecting the level of NIMs, and its effect is stronger for the second sub-period. As discussed earlier, the focus of lending type shifted from collateralized to credit lending, and the results here indicate this shift as well. The results show that, given this shift, in the second sub-period one can see that higher credit lending market share led to higher NIMs. Based on the demand side of the superiority hypothesis, high credit lending market share increases demand for a bank's credit loans and raise the NIMs. It means that a relatively popular cash card or credit card may induce more potential customers to apply, raising the demand and resulting in higher lending rates.

The collateralized lending market share, on the other hand, has significant impacts between 1999 and 2000, but it loses its significance from 2001 to 2009. This also indicates the shift of lending type.

There is a dramatic period-to-period change in the statistical significance of the service income to total income ratio. As discussed earlier, banks may charge higher lending rates if they have a higher portion of income coming from service fees, and the results are highly significant in the period of 1991-2000. But the variable experiences a drop in significance for 2001-2009. The results support the demand side of Demsetz's superiority hypothesis.

For market concentration, we are unable to draw firm conclusions based on the data as some regression yield contradictory results, hence providing little support for Bain's collusion hypothesis. There are two potential reasons. First, the Taiwanese banking industry's concentration is too low for the Herfindahl indices to yield meaningful results. Based on general findings using the Herfindahl indices (Geithman, Marvel and Weiss, 1981), if the top four (top eight) firms' concentration ratios are less than 50% (70%) the derivative of profits with respect to concentration is essential zero. This means that any meaningful results would have to come from data sets which have higher concentration. Second, the biggest banks in Taiwan are all state-owned banks. It is quite possible that government banks are not likely to be collusive between each other or with private sector rivals, and that government banks do not set prices to maximize profits but to maximize the consumer welfare and break even. Therefore, efficiency and unilateral market power may affect the NIMs, and the market concentration would not affect them.

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Table 1: Sample Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
NIMs	5278	3.571449	2.339307	0	64
Debt to assets ratio	5272	89.76445	11.46907	0.73	99.17
NPL percentage	5278	3.001228	2.432975	0	16.33
Service/ interest income	5242	0.0571841	0.052747	0	0.779462
Administrative cost/ total revenue	5260	23.23901	7.73967	0	64.17
Discount rate	5278	3.575374	1.550582	1.25	6.25
Base lending rate	5278	6.08897	1.898596	3.162	8.647
Credit/ collateralized lending	5042	9.644629	69.92915	0	556.5624
Liquid ratio	5272	0.2645425	0.0972346	0.0317914	0.9690241
Loss reserve ratio	5199	1.231333	0.7663322	0	10.42
Total assets growth	5260	15.03355	36.75141	-38.76	902.81
Lending to deposit ratio	5244	90.19424	36.0609	0	508.93
Bank asset to GDP	5149	5210.793	1385.181	818.3441	7586.106
GDP growth rate	5149	4.721824	4.214922	-9.88	12.62
Stock cap to GDP ratio	5149	0.7818385	1.335686	0.1760109	7.555964
Monthly total assets	5279	1.35E+10	5.37E+09	0	2.15E+10
Mkt share of credit lending	5230	0.0397706	0.0495375	0	0.4465027
Mkt share of collateralized lending	5230	0.0397706	0.0485395	0	0.6360543
Log total branches	4754	7.929741	0.19211	7.499424	8.105609
Average monthly market share (%)	5117	2.214688	2.036833	0	9.21
Bank branch market share	4651	0.0234938	0.0171975	0.0006037	0.0919118

Table 2: Deposit and Branch Market Shares – Base Model

Average monthly deposit and branch market shares are used as the explanatory variables of interest. The regression model uses fundamental bank information, excluding macroeconomic and lending practice information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Average Monthly Deposit Market Share			Bank Branch Market Share		
	All	**1991~2000**	**2001~2009**	**All**	**1991~2000**	**2001~2009**
Debt-to-Asset Ratio	-0.06503***	-0.03433***	-0.06772***	-0.18554***	-0.23689***	-0.07322***
	(15.51)	(4.95)	(11.19)	(43.33)	(38.98)	(11.89)
NPL Percentage	0.06416***	0.01672	0.12501***	0.11648***	0.04651	0.12597***
	(7.05)	(1.02)	(13.57)	(10.26)	(1.64)	(13.55)
Service Interest to Total Income	3.64992***	11.69017***	2.33535***	4.44110***	27.34636***	2.23780***
	(7.06)	(8.68)	(5.13)	(7.27)	(13.98)	(4.82)
Administrative Cost Percentage	0.03917***	0.16737***	-0.03520***	0.01251***	0.15853***	-0.03369***
	(11.35)	(21.89)	(9.89)	(2.93)	(12.02)	(9.27)
Discount Rates	-0.05206***	-0.51979***	-0.11768***	-0.02824	-0.47715***	-0.10248***
	(2.68)	(8.86)	(5.00)	(1.22)	(5.22)	(4.27)
Base Lending Rate	0.14704***	0.77028***	-0.09895***	0.01795	0.59308***	-0.10413***
	(8.24)	(8.80)	(6.17)	(0.85)	(3.60)	(6.38)
Liquid Ratio	6.37397***	5.24137***	2.07630***	6.80676***	-0.24302	2.42186***
	(24.53)	(10.44)	(7.48)	(21.40)	(0.30)	(8.19)
Average Monthly MKT Share	0.15968***	0.12501**	-0.22880***			
	(5.97)	(2.26)	(6.44)			
Bank Branch MKT Share				0.48439***	0.56965***	-0.06160*
				(14.73)	(5.58)	(1.90)
Observations	5081	2290	2791	4621	1802	2819
Number of Banks	32	29	32	32	29	32
R-squared	0.23392	0.49333	0.24600	0.39503	0.59988	0.23167

	Average Monthly Deposit Market Share			Bank Branch Market Share		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.03246***	-0.03401***	-0.06153***	-0.18169***	-0.21607***	-0.06725***
	(7.09)	(5.10)	(10.35)	(43.43)	(37.26)	(11.08)
NPL Percentage	0.06000***	0.07866***	0.12781***	0.11713***	0.13906***	0.12817***
	(6.58)	(5.13)	(13.73)	(10.41)	(5.19)	(13.63)
Service Interest to Total Income Ratio	3.92158***	13.12071***	1.40197***	4.14365***	25.60361***	1.35685***
	(7.49)	(9.57)	(2.98)	(6.71)	(12.75)	(2.83)
Administrative Cost Percentage	0.03305***	0.15423***	-0.02727***	0.00750*	0.12635***	-0.02594***
	(9.61)	(22.34)	(7.73)	(1.79)	(10.46)	(7.18)
Discount Rates	-0.07128***	-0.28636***	-0.06618***	-0.04543**	-0.07021	-0.05204**
	(3.66)	(4.95)	(2.83)	(1.99)	(0.72)	(2.18)
Base Lending Rate	0.15457***	0.57027***	-0.09410***	0.00426	0.31988**	-0.09636***
	(8.95)	(6.80)	(6.01)	(0.21)	(2.11)	(6.04)
Liquid Ratio	5.33713***	1.42019***	1.77920***	7.13189***	-0.21343	2.19049***
	(20.80)	(2.87)	(6.61)	(23.11)	(0.26)	(7.62)
Loss Reserve to Total Lending Ratio	0.17275***	-0.25029***	0.05006**	0.08386***	-0.05653	0.05175**
	(7.11)	(2.98)	(2.43)	(2.98)	(0.44)	(2.45)
Total Assets Growth Rate	0.01306***	0.01269***	0.01701***	0.01163***	0.00611***	0.01716***
	(17.23)	(17.86)	(13.84)	(20.21)	(8.12)	(13.66)
Lending to Deposit Ratio	-0.00574***	-0.03142***	-0.00210***	-0.00452***	-0.04210***	-0.00208***
	(7.65)	(14.36)	(3.28)	(5.10)	(11.49)	(3.19)
Credit-to-Collateralized Lending Ratio	-0.00072***	0.02709	-0.00064*	-0.00031	-0.11461	-0.00050
	(2.68)	(0.29)	(1.76)	(0.96)	(0.73)	(1.36)
Average Monthly MKT Share	0.10812***	0.18975***	-0.25218***			
	(3.95)	(3.87)	(7.18)			
Bank Branch MKT Share				0.53610***	0.50941***	-0.04771
				(16.23)	(5.41)	(1.49)
Observations	4947	2214	2733	4524	1763	2761
Number of Banks	32	29	32	32	29	32
R-squared	0.29187	0.62342	0.29645	0.45581	0.69793	0.28113

Average monthly deposit and branch market shares are used as the explanatory variables of interest. The regression model uses fundamental bank information, lending practice and macroeconomic information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Average Monthly Deposit Market Share			Bank Branch Market Share		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.04030***	-0.03870***	-0.06353***	-0.05996***	-0.06785***	-0.07091***
	(8.19)	(5.54)	(9.76)	(9.66)	(5.16)	(10.74)
NPL Percentage	0.05840***	0.03055*	0.13299***	0.08685***	0.05954***	0.13684***
	(6.33)	(1.82)	(13.34)	(9.25)	(3.14)	(13.70)
Service Interest to Total Income Ratio	3.88882***	12.07762***	1.22730***	3.53967***	14.33368***	1.16710**
	(7.50)	(8.83)	(2.60)	(6.83)	(10.59)	(2.43)
Administrative Cost Percentage	0.03024***	0.15156***	-0.02740***	0.01127***	0.16136***	-0.02671***
	(8.60)	(21.28)	(7.42)	(3.14)	(19.26)	(7.11)
Discount Rates	-0.08349***	0.21138**	-0.05050**	0.04239*	0.26551**	-0.03941
	(3.70)	(2.31)	(1.98)	(1.76)	(2.50)	(1.51)
Base Lending Rate	0.11540***	0.15396	-0.07554***	0.07552***	0.33024***	-0.06835***
	(6.27)	(1.61)	(4.34)	(4.19)	(2.79)	(3.86)
Liquid Ratio	5.15146***	1.55733***	1.84433***	5.93222***	1.13674*	2.30483***
	(18.56)	(2.77)	(6.47)	(20.73)	(1.86)	(7.79)
Loss Reserve to Total Lending	0.15884***	-0.29814***	0.03983*	0.12539***	-0.15460*	0.03776*
	(6.60)	(3.56)	(1.91)	(5.35)	(1.87)	(1.78)
Total Assets Growth Rate	0.00973***	0.01286***	0.01553***	0.00341***	-0.00052	0.01537***
	(10.15)	(11.20)	(12.39)	(2.77)	(0.27)	(12.03)
Lending to Deposit Ratio	-0.00519***	-0.02972***	-0.00236***	-0.00410***	-0.03435***	-0.00243***
	(6.91)	(12.62)	(3.69)	(5.49)	(13.59)	(3.74)
Credit-to-Collateralized Lending	-0.00078***	-0.09523	-0.00063*	-0.00044	0.06189	-0.00049
	(2.92)	(1.03)	(1.75)	(1.64)	(0.59)	(1.33)
Bank Assets to GDP Ratio	-20.79080***	-29.56286***	10.54492***	11.06077***	10.15738*	11.57668***
	(8.47)	(9.26)	(3.07)	(3.19)	(1.87)	(3.31)
GDP Growth Rate	-0.01890***	-0.05628***	0.01198***	0.00385	-0.01886	0.01177***
	(4.00)	(4.12)	(2.78)	(0.79)	(1.30)	(2.68)
Stock Capitalization to GDP Ratio	-0.08756***	0.64845***	-0.02012*	-0.09836***	1.11856***	-0.02891**
	(6.46)	(2.66)	(1.80)	(7.37)	(4.49)	(2.52)
Monthly Total Assets	0.36699***	0.93384***	0.33883	0.27287**	-0.05567	0.58025***
	(3.80)	(5.78)	(1.56)	(2.43)	(0.26)	(2.62)
Average Monthly MKT Share	0.10014***	0.11480**	-0.23911***			
	(3.65)	(2.33)	(6.72)			
Bank Branch MKT Share				0.40110***	-0.035820	-0.047369
				(14.36)	(0.47)	(1.42)
Observations	4922	2189	2733	4507	1746	2761
Number of Banks	32	29	32	32	29	32
R-squared	0.28840	0.61266	0.30484	0.25143	0.36631	0.29347

Table 5: Credit Lending and Collateralized Lending Market Shares – Base Model

Monthly credit lending market share and collateralized lending market share are used as the explanatory variables of interest.   The regression model uses fundamental bank information, excluding macroeconomic and lending practice information.   Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Credit Lending			Collateralized Lending		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.12560***	-0.18245***	-0.01779***	-0.12448***	-0.18370***	-0.01844***
	(32.39)	(32.78)	(4.61)	(32.16)	(33.43)	(4.75)
NPL Percentage	0.10167***	-0.00916	0.12463***	0.09650***	0.01099	0.11910***
	(7.37)	(0.37)	(13.23)	(7.03)	(0.45)	(12.60)
Service Interest to Total Income Ratio	12.80739***	33.15070***	1.54377***	12.96833***	33.46166***	1.34533***
	(20.72)	(37.72)	(3.42)	(20.99)	(38.34)	(2.98)
Administrative Cost Percentage	0.00636	0.05634***	-0.02513***	0.00670	0.06152***	-0.02702***
	(1.28)	(6.01)	(6.90)	(1.35)	(6.55)	(7.44)
Discount Rates	0.08606***	-0.48621***	-0.16855***	0.08742***	-0.46846***	-0.17106***
	(2.95)	(5.09)	(7.23)	(2.99)	(4.95)	(7.28)
Base Lending Rate	0.02408	-0.05262	-0.06029***	0.03150	-0.10843	-0.06231***
	(0.92)	(0.35)	(3.81)	(1.21)	(0.74)	(3.90)
Liquid Ratio	6.66927***	6.29387***	1.97553***	6.75137***	6.13639***	1.76519***
	(17.84)	(8.32)	(7.51)	(18.06)	(8.16)	(6.62)
Mkt Share of Credit Lending	5.42561***	3.65599***	6.54808***			
	(7.12)	(4.59)	(4.55)			
Collateralized Lending Mkt Share				4.05908***	4.73289***	0.17938
				(6.13)	(6.72)	(0.14)
Observations	5230	2322	2908	5230	2322	2908
Number of Banks	34	31	34	34	31	34
R-squared	0.37784	0.70559	0.19732	0.37627	0.70863	0.19153

Table 6: Credit Lending and Collateralized Lending Market Shares – Adding Lending Practice Information

Monthly credit lending market share and collateralized lending market share are used as the explanatory variables of interest. The regression model uses fundamental bank information and lending practice information, excluding macroeconomic information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Credit Lending			Collateralized Lending		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.12989***	-0.17699***	-0.02396***	-0.12919***	-0.17906***	-0.02512***
	(33.81)	(33.74)	(5.69)	(33.66)	(34.61)	(5.94)
NPL Percentage	0.10487***	0.05813**	0.11825***	0.09825***	0.07367***	0.11433***
	(7.73)	(2.37)	(12.29)	(7.30)	(3.02)	(11.78)
Service Interest to Total Income Ratio	13.46061***	29.83820***	1.43106***	13.62388***	30.17610***	1.18764***
	(22.54)	(35.45)	(3.12)	(22.83)	(36.14)	(2.59)
Administrative Cost Percentage	0.00163	0.04865***	-0.02518***	0.00092	0.05350***	-0.02682***
	(0.33)	(4.98)	(6.85)	(0.19)	(5.50)	(7.31)
Discount Rates	0.08460***	-0.23835***	-0.14301***	0.08206***	-0.22810**	-0.14337***
	(2.97)	(2.60)	(6.07)	(2.88)	(2.52)	(6.03)
Base Lending Rate	0.03026	-0.08768	-0.05863***	0.03684	-0.17272	-0.06213***
	(1.20)	(0.64)	(3.69)	(1.47)	(1.29)	(3.88)
Liquid Ratio	6.13545***	4.83278***	2.02017***	6.18788***	4.53672***	1.77151***
	(16.90)	(6.41)	(7.55)	(17.05)	(6.05)	(6.53)
Loss Reserve to Total Lending Ratio	0.06246*	-0.36152**	0.06007***	0.07261**	-0.30781**	0.05561**
	(1.72)	(2.54)	(2.77)	(2.00)	(2.19)	(2.56)
Total Assets Growth Rate	0.00880***	0.00729***	0.00504***	0.00879***	0.00731***	0.00530***
	(14.41)	(10.26)	(7.32)	(14.38)	(10.44)	(7.66)
Lending to Deposit Ratio	-0.01220***	-0.04258***	-0.00199***	-0.01206***	-0.04308***	-0.00184***
	(11.03)	(12.86)	(2.95)	(10.89)	(13.20)	(2.72)
Mkt Share of Credit Lending	5.93356***	3.84844***	6.36734***			
	(7.82)	(4.99)	(4.43)			
Collateralized Lending Mkt Share				4.54213***	5.05363***	-0.53637
				(7.19)	(7.87)	(0.41)
Observations	5187	2302	2885	5187	2302	2885
Number of Banks	33	30	33	33	30	33
R-squared	0.43807	0.75882	0.21904	0.43704	0.76267	0.21369

	Credit Lending			Collateralized Lending		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.04527***	-0.02947***	-0.06678***	-0.04413***	-0.03374***	-0.06564***
	(9.07)	(4.47)	(10.28)	(8.90)	(5.13)	(10.04)
NPL Percentage	0.06796***	0.00253	0.13606***	0.06397***	0.00899	0.13072***
	(7.39)	(0.16)	(13.98)	(7.01)	(0.57)	(13.30)
Service Interest to Total Income	3.58904***	8.06275***	1.48868***	3.74984***	8.24047***	1.12515**
	(7.20)	(6.85)	(3.23)	(7.54)	(7.03)	(2.44)
Administrative Cost Percentage	0.03093***	0.15013***	-0.02275***	0.02988***	0.15683***	-0.02423***
	(8.84)	(20.95)	(6.15)	(8.57)	(21.86)	(6.53)
Discount Rates	-0.03138	0.21714**	-0.03018	-0.04229*	0.17807**	-0.03127
	(1.36)	(2.39)	(1.17)	(1.87)	(1.97)	(1.21)
Base Lending Rate	0.10636***	0.17348*	-0.05879***	0.10733***	0.14994	-0.06584***
	(5.78)	(1.86)	(3.34)	(5.83)	(1.61)	(3.71)
Liquid Ratio	5.81027***	2.08095***	2.78083***	5.78300***	1.78543***	2.41221***
	(20.97)	(3.76)	(9.63)	(20.90)	(3.22)	(8.32)
Loss Reserve to Total Lending	0.15232***	-0.30219***	0.05151**	0.15887***	-0.27804***	0.04989**
	(6.31)	(3.64)	(2.45)	(6.58)	(3.34)	(2.36)
Total Assets Growth Rate	0.01048***	0.01167***	0.01481***	0.01022***	0.01304***	0.01603***
	(10.81)	(9.87)	(11.64)	(10.58)	(11.19)	(12.47)
Lending to Deposit Ratio	-0.00573***	-0.02843***	-0.00254***	-0.00559***	-0.02953***	-0.00239***
	(7.59)	(12.17)	(3.92)	(7.40)	(12.58)	(3.67)
Bank Assets to GDP Ratio	-15.76297***	-35.38536***	14.04391***	-17.54651***	-27.84597***	13.30336***
	(5.95)	(10.19)	(4.11)	(6.85)	(8.27)	(3.87)
GDP Growth Rate	-0.01376***	-0.06601***	0.01471***	-0.01525***	-0.05344***	0.01384***
	(2.88)	(4.84)	(3.42)	(3.21)	(3.95)	(3.20)
Stock Capitalization to GDP Ratio	-0.09349***	0.79136***	-0.04606***	-0.09384***	0.78051***	-0.04095***
	(7.03)	(3.25)	(4.15)	(7.05)	(3.21)	(3.68)
Monthly Total Assets	0.56520***	1.04400***	0.42608**	0.55240***	1.05445***	0.34439
	(5.89)	(6.60)	(2.01)	(5.77)	(6.69)	(1.62)
Mkt Share of Credit Lending	4.45871***	-1.32599*	7.60108***			
	(6.32)	(1.78)	(5.48)			
Collateralized Lending Mkt Share				3.25418***	1.93268***	-1.10599
				(6.06)	(3.61)	(0.87)
Observations	5092	2241	2851	5092	2241	2851
Number of Banks	32	29	32	32	29	32
R-squared	0.29121	0.60319	0.30638	0.29077	0.60496	0.29915

Table 8: Herfindahls based on Bank Deposits and Branches - Base Model

Average monthly deposit and branch market shares are used as the explanatory variables of interest. The regression model uses fundamental bank information, excluding macroeconomic and lending practice information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Herfindahl based on Bank Deposits			Herfindahl based on Bank Branches		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.12096***	-0.18250***	-0.00928**	-0.11950***	-0.18089***	-0.00869**
	(31.72)	(33.52)	(2.35)	(30.98)	(33.49)	(2.21)
NPL Percentage	0.08404***	-0.01231	0.10699***	0.08789***	-0.07799***	0.10342***
	(6.20)	(0.51)	(11.47)	(6.37)	(3.02)	(11.04)
Service Interest to Total Income	13.23573***	32.88878***	1.67148***	13.25493***	33.11185***	1.55452***
	(21.48)	(37.65)	(3.75)	(21.42)	(38.04)	(3.50)
Administrative Cost Percentage	0.00635	0.04457***	-0.01858***	0.00597	0.06728***	-0.01838***
	(1.28)	(4.78)	(5.03)	(1.20)	(7.10)	(4.99)
Discount Rates	0.04834	-0.39797***	-0.05852**	0.09784***	-0.48827***	-0.06258**
	(1.60)	(4.24)	(2.25)	(3.34)	(5.19)	(2.45)
Base Lending Rate	-0.00436	-0.15891	-0.12574***	0.02871	0.92955***	-0.10500***
	(0.16)	(1.08)	(7.38)	(1.04)	(5.46)	(6.48)
Liquid Ratio	6.23430***	6.09701***	0.84729***	6.66575***	6.78287***	0.84165***
	(16.02)	(8.16)	(3.10)	(17.08)	(9.17)	(3.09)
Deposit Herfindahl	-42.72997***	-58.40136***	-108.38176***			
	(5.91)	(6.84)	(9.33)			
Branch Herfindahl				-7.59199**	35.74178***	-48.13836***
				(2.09)	(7.17)	(9.73)
Observations	5242	2334	2908	5242	2334	2908
Number of Banks	34	31	34	34	31	34
R-squared	0.37606	0.70882	0.21535	0.37240	0.70940	0.21737

Table 9: Herfindahls based on Bank Deposits and Branches - Adding Lending Practice Information

Average monthly deposit and branch market shares are used as the explanatory variables of interest. The regression model uses fundamental bank information, excluding macroeconomic and lending practice information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Herfindahl based on Bank Deposits			Herfindahl based on Bank Branches		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.17667***	-0.17638***	-0.05389***	-0.17994***	-0.17517***	-0.05184***
	(45.44)	(33.97)	(8.21)	(45.57)	(33.58)	(7.90)
NPL Percentage	0.09102***	0.06923***	0.11780***	0.08076***	0.02820	0.11499***
	(7.37)	(2.85)	(12.30)	(6.44)	(1.07)	(11.94)
Service Interest to Total Income	17.70783***	31.08173***	1.60124***	17.66008***	31.51755***	1.53622***
	(30.67)	(36.36)	(3.33)	(30.62)	(36.81)	(3.20)
Administrative Cost Percentage	-0.00413	0.04804***	-0.02164***	-0.00371	0.06019***	-0.02090***
	(0.90)	(4.90)	(5.83)	(0.81)	(6.06)	(5.63)
Discount Rates	0.05556**	-0.03627	-0.02865	0.06411**	-0.10690	-0.02480
	(2.03)	(0.39)	(1.12)	(2.41)	(1.13)	(0.98)
Base Lending Rate	0.06847***	-0.09451	-0.10624***	0.12615***	0.47421***	-0.09944***
	(2.82)	(0.66)	(6.33)	(5.15)	(2.91)	(6.20)
Liquid Ratio	6.55249***	3.77862***	1.93548***	7.29438***	4.15112***	1.85923***
	(18.53)	(4.95)	(6.53)	(20.48)	(5.41)	(6.32)
Loss Reserve to Total Lending Ratio	0.11569***	-0.32449**	0.07100***	0.12226***	-0.20620	0.07207***
	(3.46)	(2.28)	(3.34)	(3.67)	(1.45)	(3.40)
Total Assets Growth Rate	0.00687***	0.00636***	0.01657***	0.00754***	0.00630***	0.01660***
	(10.88)	(9.15)	(13.04)	(11.92)	(9.03)	(13.14)
Lending to Deposit Ratio	-0.00898***	-0.04481***	-0.00195***	-0.00854***	-0.04421***	-0.00196***
	(8.81)	(13.74)	(2.98)	(8.36)	(13.32)	(3.00)
Credit-to-Collateralized Lending	-0.00113***	-0.17812	-0.00049	-0.00119***	-0.18824	-0.00051
	(3.07)	(1.27)	(1.33)	(3.26)	(1.34)	(1.39)
Deposit Herfindahl	-16.71014**	-44.24583***	-45.96409***			
	(2.53)	(5.45)	(3.75)			
Branch Herfindahl				15.19869***	15.99483***	-23.44774***
				(4.52)	(3.34)	(4.52)
Observations	5027	2233	2794	5027	2233	2794
Number of Banks	32	29	32	32	29	32
R-squared	0.54128	0.77392	0.28268	0.54258	0.77202	0.28432

Table 10: Herfindahls based on Bank Deposits and Branches - Adding Macroeconomic Information

Average monthly deposit and branch market shares are used as the explanatory variables of interest. The regression model uses fundamental bank information, lending practice and macroeconomic information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Herfindahl based on Bank Deposits			Herfindahl based on Bank Branches		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.03778***	-0.02580***	-0.05966***	-0.03426***	-0.03621***	-0.05906***
	(7.72)	(3.81)	(9.11)	(6.93)	(5.48)	(9.10)
NPL Percentage	0.05887***	0.01423	0.13520***	0.05955***	0.01010	0.13680***
	(6.32)	(0.90)	(13.74)	(6.45)	(0.63)	(14.00)
Service Interest to Total Income	4.13089***	10.95732***	1.35435***	3.96478***	12.15072***	1.13212**
	(7.89)	(7.93)	(2.83)	(7.56)	(8.90)	(2.38)
Administrative Cost Percentage	0.02704***	0.15423***	-0.02413***	0.02709***	0.15302***	-0.02447***
	(7.67)	(21.60)	(6.50)	(7.72)	(21.45)	(6.64)
Discount Rates	-0.06664***	0.12942	-0.02898	-0.04549**	0.10401	-0.04444*
	(2.94)	(1.40)	(1.12)	(1.96)	(1.09)	(1.73)
Base Lending Rate	0.09712***	0.27398***	-0.05944***	0.08879***	0.37761***	-0.00633
	(5.17)	(2.80)	(3.38)	(4.78)	(3.34)	(0.34)
Liquid Ratio	5.54071***	1.64172***	1.92084***	5.43984***	1.61177***	1.82978***
	(19.90)	(2.96)	(6.55)	(19.57)	(2.89)	(6.33)
Loss Reserve to Total Lending	0.15455***	-0.27549***	0.05581***	0.15532***	-0.31947***	0.05496***
	(6.36)	(3.29)	(2.65)	(6.41)	(3.84)	(2.63)
Total Assets Growth Rate	0.00953***	0.01335***	0.01373***	0.00957***	0.01238***	0.01355***
	(9.84)	(11.57)	(10.62)	(9.91)	(10.80)	(10.63)
Lending to Deposit Ratio	-0.00566***	-0.02897***	-0.00216***	-0.00573***	-0.02886***	-0.00215***
	(7.45)	(12.39)	(3.33)	(7.56)	(12.31)	(3.34)
Credit-to-Collateralized Lending	-0.00094***	-0.21486**	-0.00044	-0.00093***	-0.11098	-0.00047
	(3.55)	(2.28)	(1.20)	(3.52)	(1.21)	(1.28)
Bank Assets to GDP Ratio	-21.83327***	-40.23366***	4.97412	-23.95032***	-24.22385***	0.23261
	(8.19)	(10.15)	(1.35)	(9.45)	(6.61)	(0.06)
GDP Growth Rate	-0.01923***	-0.05270***	0.01253***	-0.01670***	-0.06393***	0.00607
	(4.00)	(3.86)	(2.88)	(3.48)	(4.66)	(1.38)
Stock Capitalization to GDP Ratio	-0.09020***	0.66033***	-0.00448	-0.07861***	1.03643***	0.00786
	(6.27)	(2.72)	(0.36)	(5.72)	(3.89)	(0.64)
Monthly Total Assets	0.40050***	1.13940***	2.03419***	0.69262***	0.52280**	3.22142***
	(4.09)	(6.78)	(6.05)	(5.86)	(2.56)	(8.36)
Deposit Herfindahl	2.83207	33.00630***	-132.58194***			
	(0.41)	(4.14)	(6.21)			
Branch Herfindahl				-14.93339***	12.34532***	-88.90192***
				(4.26)	(3.32)	(8.69)
Observations	4984	2191	2793	4984	2191	2793
Number of Banks	32	29	32	32	29	32
R-squared	0.28837	0.61506	0.30332	0.29096	0.61398	0.31247

Table 11: Herfindahls based on Credit Lending and Collateralized Lending - Base Model

Monthly credit lending market share and collateralized lending market share are used as the explanatory variables of interest. The regression model uses fundamental bank information, excluding macroeconomic and lending practice information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Herfindahl based on Credit-Lending			Herfindahl based on Collateralized-Lending		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.12171***	-0.17742***	-0.01298***	-0.12260***	-0.17801***	-0.00996**
	(32.02)	(32.49)	(3.38)	(32.26)	(32.57)	(2.56)
NPL Percentage	0.10722***	-0.01061	0.11955***	0.10680***	-0.01225	0.10754***
	(7.78)	(0.43)	(12.99)	(7.78)	(0.50)	(11.59)
Service Interest to Total Income Ratio	12.75995***	33.21168***	1.45121***	12.60076***	33.11386***	1.51763***
	(20.73)	(37.49)	(3.28)	(20.45)	(37.35)	(3.42)
Administrative Cost Percentage	-0.00167	0.05085***	-0.01908***	-0.00155	0.05103***	-0.01838***
	(0.33)	(5.41)	(5.23)	(0.31)	(5.45)	(5.01)
Discount Rates	0.05447*	-0.47037***	-0.15229***	0.04627	-0.48211***	-0.04809*
	(1.85)	(4.77)	(6.61)	(1.57)	(4.94)	(1.86)
Base Lending Rate	0.03077	0.10886	-0.10694***	0.02682	0.05020	-0.10235***
	(1.19)	(0.72)	(6.62)	(1.03)	(0.33)	(6.38)
Liquid Ratio	6.38434***	6.55204***	0.99594***	6.41490***	6.44708***	0.87874***
	(16.99)	(8.59)	(3.76)	(17.14)	(8.45)	(3.27)
Credit-Lending Herfindahl	6.29515***	1.30249	-22.03993***			
	(8.65)	(1.58)	(10.39)			
Collateralized-Lending Herfindahl				4.97988***	1.33060**	-21.88726***
				(9.36)	(2.27)	(10.31)
Observations	5242	2334	2908	5242	2334	2908
Number of Banks	34	31	34	34	31	34
R-squared	0.38078	0.70322	0.22084	0.38227	0.70356	0.22043

Average monthly deposit and branch market shares are used as the explanatory variables of interest. The regression model uses fundamental bank information, excluding macroeconomic and lending practice information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

	Herfindahl based on Credit-Lending			Herfindahl based on Collateralized-Lending		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.17571***	-0.17422***	-0.05643***	-0.17612***	-0.17455***	-0.05344***
	(45.24)	(33.38)	(9.04)	(45.46)	(33.39)	(8.30)
NPL Percentage	0.10618***	0.06996***	0.12360***	0.10881***	0.06798***	0.11791***
	(8.37)	(2.82)	(13.17)	(8.63)	(2.77)	(12.40)
Service Interest to Total Income Ratio	17.45906***	31.17732***	1.55065***	17.30645***	31.12799***	1.52768***
	(30.20)	(35.96)	(3.23)	(29.92)	(35.87)	(3.19)
Administrative Cost Percentage	-0.00836*	0.05134***	-0.02207***	-0.00901*	0.05164***	-0.02132***
	(1.81)	(5.18)	(6.03)	(1.96)	(5.24)	(5.77)
Discount Rates	0.05464**	-0.12168	-0.06787***	0.04504*	-0.12362	-0.02143
	(2.04)	(1.24)	(2.88)	(1.68)	(1.27)	(0.84)
Base Lending Rate	0.07884***	0.08210	-0.10026***	0.07447***	0.05016	-0.09795***
	(3.42)	(0.57)	(6.23)	(3.23)	(0.34)	(6.13)
Liquid Ratio	6.50911***	3.76100***	2.00782***	0.00000	3.74770***	1.90455***
	(18.95)	(4.85)	(7.08)	(19.01)	(4.84)	(6.55)
Loss Reserve to Total Lending Ratio	0.11122***	-0.25746*	0.06637***	0.11190***	-0.25957*	0.06727***
	(3.34)	(1.81)	(3.15)	(3.36)	(1.82)	(3.19)
Total Assets Growth Rate	0.00692***	0.00640***	0.01583***	0.00694***	0.00642***	0.01602***
	(11.07)	(9.13)	(12.18)	(11.13)	(9.16)	(12.46)
Lending to Deposit Ratio	-0.00912***	-0.04600***	-0.00207***	-0.00907***	-0.04578***	-0.00204***
	(8.97)	(14.06)	(3.17)	(8.94)	(13.98)	(3.13)
Credit-to-Collateralized Lending	-0.00116***	-0.26652*	-0.00041	-0.00117***	-0.27311*	-0.00049
	(3.17)	(1.87)	(1.12)	(3.20)	(1.92)	(1.34)
Credit-Lending Herfindahl	3.83385***	1.72059**	-9.70925***			
	(5.19)	(2.01)	(4.35)			
Collateralized-Lending Herfindahl				3.64713***	1.42264**	-10.05430***
				(6.60)	(2.28)	(4.45)
Observations	5027	2233	2794	5027	2233	2794
Number of Banks	32	29	32	32	29	32
R-squared	0.54316	0.77128	0.28394	0.54468	0.77140	0.28416

Table 13: Herfindahls based on Credit Lending and Collateralized Lending - Adding Macroeconomic Information

Average monthly deposit and branch market shares are used as the explanatory variables of interest.   The regression model uses fundamental bank information, lending practice and macroeconomic information. Absolute value of t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%

|	Herfindahl - Credit-Lending			Herfindahl - Collateralized-Lending		
	All	1991~2000	2001~2009	All	1991~2000	2001~2009
Debt-to-Asset Ratio	-0.04031***	-0.02916***	-0.06379***	-0.04065***	-0.03021***	-0.06255***
	(8.28)	(4.42)	(9.62)	(8.34)	(4.60)	(9.53)
NPL Percentage	0.06685***	0.00901	0.13121***	0.06660***	0.00764	0.13297***
	(7.20)	(0.56)	(13.28)	(7.18)	(0.48)	(13.46)
Service Interest to Total Income	3.95722***	11.63221***	1.32511***	3.91325***	11.74582***	1.31578***
	(7.58)	(8.53)	(2.75)	(7.50)	(8.62)	(2.74)
Administrative Cost Percentage	0.02467***	0.15463***	-0.02431***	0.02511***	0.15487***	-0.02443***
	(7.01)	(21.62)	(6.49)	(7.15)	(21.63)	(6.55)
Discount Rates	0.00160	0.16512*	-0.04524	-0.02531	0.13122	-0.03350
	(0.06)	(1.81)	(1.64)	(1.09)	(1.42)	(1.29)
Base Lending Rate	0.12929***	0.18990**	-0.06575***	0.11783***	0.15202	-0.05424***
	(6.78)	(2.00)	(3.64)	(6.30)	(1.60)	(3.03)
Liquid Ratio	5.76833***	1.71499***	2.32025***	5.71518***	1.64677***	2.18253***
	(20.71)	(3.09)	(7.86)	(20.59)	(2.97)	(7.48)
Loss Reserve to Total Lending	0.15220***	-0.28997***	0.04868**	0.15420***	-0.29282***	0.04932**
	(6.30)	(3.48)	(2.29)	(6.38)	(3.51)	(2.33)
Total Assets Growth Rate	0.00958***	0.01354***	0.01505***	0.00952***	0.01354***	0.01441***
	(9.94)	(11.67)	(11.57)	(9.89)	(11.67)	(11.06)
Lending to Deposit Ratio	-0.00572***	-0.02829***	-0.00243***	-0.00566***	-0.02828***	-0.00234***
	(7.57)	(12.04)	(3.72)	(7.50)	(12.03)	(3.60)
Credit-to-Collateralized Lending	-0.00099***	-0.19844**	-0.00047	-0.00098***	-0.18861**	-0.00046
	(3.76)	(2.12)	(1.29)	(3.70)	(2.03)	(1.26)
Bank Assets to GDP Ratio	-10.80794***	-22.04006***	12.14298***	-10.35129***	-22.43156***	8.17747**
	(3.72)	(5.88)	(3.33)	(3.54)	(6.08)	(2.16)
GDP Growth Rate	-0.01437***	-0.04412***	0.01256***	-0.01139**	-0.04091***	0.00814*
	(2.99)	(3.15)	(2.86)	(2.34)	(2.88)	(1.78)
Stock Capitalization to GDP	-0.11895***	0.86294***	-0.03137**	-0.10599***	0.71459***	-0.01229
	(8.35)	(3.49)	(2.22)	(7.71)	(2.94)	(0.88)
Monthly Total Assets	0.72208***	1.27794***	0.43876**	0.57346***	1.16488***	1.05276***
	(6.73)	(7.08)	(2.03)	(5.75)	(6.86)	(3.61)
Credit-Lending Herfindahl	7.84642***	6.08593***	-2.44353			
	(6.81)	(4.14)	(0.80)			
Collateralized-Lending Herfindahl				5.13710***	3.69224***	-12.50610***
				(6.94)	(4.17)	(3.20)
Observations	4984	2191	2793	4984	2191	2793
Number of Banks	32	29	32	32	29	32
R-squared	0.29497	0.61507	0.29370	0.29522	0.61512	0.29615
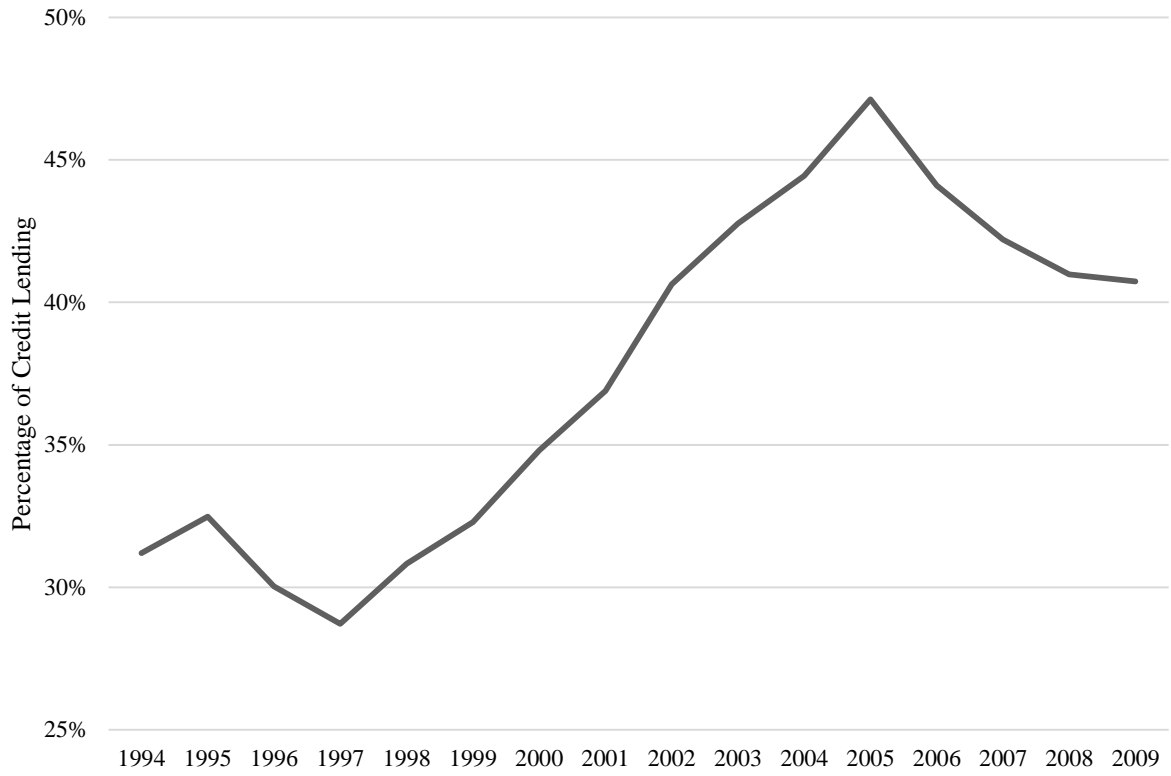
Figure 1. Credit lending to total lending: historical percentage