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**WORKING PAPER SERIES**

**WP 06/09**

**The Profitability of Banks in Japan: The Road To  
Recovery?**

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# THE PROFITABILITY OF BANKS IN JAPAN: THE ROAD TO RECOVERY?

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*This version: 10 November 2009*

## **Abstract:**

This paper investigates the profitability of City, Trust, Regional, Second Association Regional, Shinkin and Credit Cooperative banks following the major financial crisis that affected Japan in the mid 1990s. We find evidence that well capitalised, efficient banks, with lower credit risks tend to outperform less capitalised, less efficient counterparts with higher credit risks. Second Association Regional banks and Shinkin banks (but not other ownership types) appear to benefit from diversification advantages which feed through to profitability. Furthermore, we find that industry concentration, GDP growth and stock market development play an important role in determining the profitability of Japanese banks.

**Keywords: Banking, competition, dynamic panel estimation, Japan, profitability**

JEL Codes: G21 L1

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## **1. Introduction**

Following a period of financial deregulation and increased competition in the banking and financial sectors, Japan was hit by a major financial crisis between 1997 and 1998. A number of housing loan companies (Jusen), cooperative banks, regional banks and larger banks failed over this period while others were bailed out or nationalised. Such failures and bailouts led to contagion in bank equity prices as investors sought to impose greater discipline on the banks which survived (SPIEGEL and YAMORI, 2004). Between the periods 1998 to 2000 a number of measures were introduced to stabilise the financial system. These measures (many of which were included in the Financial Function Stabilization Act) included: temporary government control or closure of insolvent institutions; capital injections; strengthening deposit insurance guarantees, the creation of asset management companies (to buy bad loans from banks) and changes in loan losses provisioning rules (MONTGOMERY and SHIMIZUTAMI, 2009). However, many argued that the government response to the crisis was slow and uncoordinated and may have exacerbated the lack of confidence in the banking industry. Overall, the lack of coherence in government policy, the small scale of asset purchases and capital injections to the banking system all acted to exacerbate an already serious situation (HOSHI and KASHYAP, 2008).

Banks themselves found it difficult to recapitalise as profits and external capital from market participants was low. Further, the ability of banks to extend finance to the corporate sector was curtailed as a result of the high level of non-performing assets. Consequently, banks reduced lending while tightening credit terms. Stock market values and real investment declined, and the economy entered a long lasting recession (NAKASO, 2001; HAYASHI and PRESCOTT, 2002; BREWER et al, 2003; DECKLE and KLETZER, 2003). This has led to Japanese Banks recording

low levels of profitability for an extended period (HATTORI ET AL, 2007). In 2007, the Japanese government published The Plan for Strengthening the Competitiveness of Japan's Financial and Capital Markets. A number of measures proposed under this plan seek to improve the regulatory and supervisory environment of the financial services industry in order to promote the international competitiveness of the Japanese Financial Services industry and improve the performance of incumbent banks.

Loosely drawing parallels between the Japanese crisis and the recent global financial crisis, this paper investigates the return to profitability of Japanese banks. Specifically, this study utilises a dynamic model of profitability to examine the extent to which bank-specific, industry-specific and macroeconomic factors determine the profitability of banks with different ownership structures (City, Trust, Regional, Second Association Regional, Shinkin and Credit Cooperative), over the period 2000-2007. Only a handful of studies have assessed the extent to which the performance of banks differs across ownership type.<sup>1</sup> For example in Europe, see GODDARD et al. (2004a,b); IANOTTA et al (2007) and BECK et al (2009). In Japan, see LOUKOIANOVA (2008); UCHIDA and TSUTSUI (2005); and UCHIDA and SATAKE (2009). There is little or no consensus in the aforementioned empirical literature as to whether private banks are better performers than their mutual and cooperative sector counterparts.

The results presented in this paper suggest that bank profitability and its determinants differ across ownership types. Specifically, while profits persist across all ownership types (implying that competition does not adjust profits to long run values instantaneously). This persistence is much stronger for the larger regional and cooperative (Shinkin) banks than their smaller (Second Association Regional and Other Cooperative) counterparts. For all bank types (except for Trust banks), high

capital ratios are associated with high profitability. Second Association Regional banks and Shinkin banks (but not other ownership types) appear to benefit from diversification advantages which feed through to profitability. Market share enhances the profitability of Shinkin banks and Other Cooperatives, but not other ownership types. Macroeconomic conditions appear to exert negative impact on Japanese banks' profitability. Overall, the results presented are of interest to policy makers and government agencies, as they suggest that the determinants and persistence of profits differs by ownership type. Furthermore, our results suggest that policies which encourage some bank ownership types to diversify their revenues streams, improve their capital levels and lower costs relative to income could generate significant welfare gains for the banking industry in Japan.

The rest of this paper is structured as follows. Section 2 provides an overview of the Japanese Banking industry. Section 3 discusses the empirical methods. Section 4 presents the data analysis, and Section 5 provides a summary.

## **2. The Evolution of the Japanese Banking Industry**

This section comprises two parts. The first part examines the banking crisis which affected the banking industry in Japan in the 1990s, and examines the policy responses. The second part provides a brief overview of the Japanese banking system.

### **2.1 The Japanese financial crisis and the regulatory response**

The banking system in Japan underwent fundamental changes following the major financial crisis that commenced in the mid 1990s (CASU et al, 2006, chapter 16. Financial deregulation allowed small financial institutions to diversify into new areas and to lend to housing finance companies, while the deregulation and

development of bond markets led to pressure on larger banks to find new ways of raising revenues (which led to banks increasing their lending to small firms and medium sized firms, and real estate developers (HOSHI and KASHYAP, 2000). This crisis arose from a large increase in bad debts in the 1990s, which in turn had arisen from the rapid increase in financial asset and property prices from the mid-1980s, which acted as collateral to borrowers, and led to excessive bank lending in real estate and construction.<sup>ii</sup> The loose monetary policy enacted by the Bank of Japan in the 1980s had created cheap credit, while subsequent tightening in the early 1990s led to a collapse in asset prices and the performance of bank loan books. The subsequent collapse in asset prices during the 1990s resulted in excessive levels of non-performing loans contributing to the financial crisis. A number of housing loan companies (Jusen), cooperative banks (including: Tokyo Kyowa; Anzen; Cosmo Credit Cooperative; and Kismo Credit Cooperative), regional banks (including Tokuyo City Bank) and larger banks (including Hokkaido Takushoki Bank) and securities houses (including Sanyo Securities) failed over this period, while others were bailed out or nationalised (including the Long Term Credit Bank of Japan and Nippon Credit Bank).

While a decline in real estate prices triggered the crisis, the long lasting effects on the economy was perhaps just as much to do with structural problems within the Japanese banking industry and wider economy as with the disjointed government policy toward the resolution of the banking crisis (MOTONISHI and YOSHIKAWA, 1999). The poor condition of a large number of borrowers has been reflected in the persistent loan losses recorded by Japanese banks (KASHYAP, 2002). This coupled with a deflationary macroeconomic environment, low margins charged on loans (and a lack of revenue diversification to offset these), losses incurred on investments in

South East Asia in the late 1990s, high labour costs and low levels of investment in new process technologies all explain the poor performance of Japanese Banks relative to their European and US counterparts (CRAIG, 1998, KASHYAP, 2002; HATTORI ET AL, 2007). This led to further government support and bail outs of banks thought too-big-to-fail, which led to a lack of market discipline on large banks (POP and POP, 2009).

In recent years a number of measures (many of which were included in the Financial Function Stabilization Act) were introduced to stabilise the financial system, to improve the regulatory and supervisory environment and to promote the performance international competitiveness of the Japanese financial services industry. This process culminated in 2007, when the Japanese government published *The Plan for Strengthening the Competitiveness of Japan's Financial and Capital Markets*.

## **2.2 The Japanese banking sector**

The banking system in Japan consists of commercial, savings and cooperative financial institutions. These comprise large City Banks, Trust Banks, Regional Banks, Second Association Regional Banks, Shinkin Banks and Credit Cooperatives.

City banks are large in size with branches in major cities throughout Japan and beyond. Consequently, these are national banks with a wide geographic scope. They have a diversified client base and product portfolio offering a wide variety of services including various non-interest earning activities such as private banking and asset management. At the end of 2007, there were 6 of these banks.

Trust banks are licensed to carry out both banking and trust activities. They focus on activities in the real estate market as well specialising in offering asset and

wealth management services to clients. At the end of 2007, there were 20 of these banks.

Regional banks are regulated under the terms of the Banking Act. These institutions operate within one of the 47 prefectures (administrative region). These institutions carry out the vast majority of their business within a given prefecture, and are an important source of finance to medium sized firms and local government<sup>iii</sup>. The majority of Regional banks are publicly quoted and the largest offer a full range of banking and financial services. At the end of 2007, there were 64 of these banks.

Member banks of the Second Association of Regional banks are similar to Regional Banks, but tend to focus on serving the needs of small business and individuals within a given prefecture. In common with City, Regional and Trust banks, these institutions are also regulated under the terms of the Banking Act. At the end of 2007, there were 45 of these banks.

Shinkin banks (otherwise known as Shin-you Kinko) are cooperative financial institutions which are based within a given region of the country. Shinkin banks were established and regulated under the terms of the Shinkin Bank Laws (1951, 1968, and 1981). Shinkin banks are not-for-profit organisations that specialize in lending to small and medium-sized member firms within their region of location. Shinkin banks underwent a phase of consolidation and re-organisation in the late 1990s (HOSONO et al, 2006). At the end of 2007, there were 280 of these banks

Credit cooperatives (otherwise known as Shin-you Kumiai) also specialize in providing banking services to member firms and individuals. In common with their larger Shinkin counterparts, the activities of credit cooperatives are restricted to a single prefecture (UCHIDA and UDELL, 2009). In 1990 there were 408 of these banks. At the end of 2007, there were 164 of these banks.

Figure 1 traces the evolution of bank profitability (measured by ROE) for each ownership type of bank over the period 2000 to 2007. By the end of 2007, City banks have the highest ROE (8.11%), followed by Trust bank (8.10%) and Regional banks (4.37%). The remaining types of banks have on average negative ROE, being -0.05, -0.58 and -0.81 respectively, This may reflect the poor quality of asset portfolios, limited product range, smaller volumes, and the pursuit of non-profit maximizing objectives.

**<Insert Figure 1 around here>**

Figure 1 shows that banks of all ownership types improved their profitability over the sample period from 2000 through 2007. Particularly, City banks had a dramatic improvement in profitability (ROE), increasing from a low of -32.8% in 2001 to a peak of 18.7% in 2005. Overall, Trust banks appear to be able to generate consistently higher profit rates, due to successful asset and wealth management activities (LOUKOIANOVA, 2008). Overall, City and Trust banks outperform their Regional and Cooperative counterparts. This is unsurprising given that both Regional and Cooperative banks operate under institutional constraints associated with their social mandate or not-for-profit status.

The Bank of Japan ended its five-year policy of near zero short-term interest rates in July 2006 when it raised its rate target to 0.25 percent and then again to 0.50 percent in February 2007. These increases in interest rates, combined with rising competition and (in selected cases) losses stemming from investments in consumer finance companies and the US sub-prime market reduced the profitability of the whole banking system (HALL, 2009).

### 3. Empirical Methods

The purpose of the estimable model outlined in this section is to capture the effects of various bank-specific, industry-specific and macroeconomic factors on bank profitability.

A dynamic model is adopted via the inclusion of a lagged dependent variable among the regressors because previous literature shows that bank profits tend to persist over time, reflecting impediments to market competition, informational opacity and/or sensitivity to regional/macroeconomic shocks (BERGER et al, 2000).

A range of variables that have been used in previous empirical studies on bank profitability are also included. These include variables (together with past profitability) such as: equity capital over total assets, liquidity, credit risk, market share, efficiency, diversification, industry concentration, real GDP growth and stock market capitalisation.

The model is specified as:

$$\pi_{it} = \alpha_i + \lambda_i \pi_{i,t-1} + \beta_1 X_{it} + \beta_2 M_t + \mu_i + v_{it} \quad i = 1..N; t = 1 \dots T \quad (1)$$

Where  $\pi_{i,t}$  is the profitability of bank  $i$  at time  $t$  and  $\pi_{i,t-1}$  is one-period lagged profitability.  $X_{it}$  is a vector of exogenous bank-specific regressors and  $M_t$  is a vector of country-specific variables.  $\mu_i$  is a fixed effect, and  $v_{it}$  is a random disturbance. In equation (1), the dependent variable is expressed as a deviation from the sample mean at time  $t$ .

Linear dynamic panel-data models include  $p$  lags of the dependent variable as covariates and contain unobserved panel-level effects, fixed or random. By

construction, the unobserved panel-level effects are correlated with the lagged dependent variables, making standard (fixed or random effects) estimators inconsistent. ARELLANO and BOND (1991) derived a consistent Generalized Method of Moments (GMM) estimator for this model. The Arellano and Bond estimator is designed for situations with ‘small T, large N’ panels, and a single left-hand-side variable that is dynamic, depending on its own past realizations. Arellano-Bond estimation starts by transforming all regressors, usually by differencing, and uses the Generalized Method of Moments (HANSEN, 1982), and so is called Difference GMM.

The Arellano and Bond estimator can perform poorly if the autoregressive parameters are too large or the ratio of the variance of the panel-level effect to the variance of idiosyncratic error is too large. Building on the work of ARELLANO and BOVER (1995), BLUNDELL and BOND (1998) developed a system estimator that makes an additional assumption, that first differences of instrument variables are uncorrelated with the fixed effects. This allows the introduction of more instruments, and can dramatically improve efficiency. Since it builds a system of two equations, the original equation as well as the transformed one, is known as System GMM (ROODMAN, 2006). Hence the two-step System GMM estimator is used to conduct the analysis. For City banks and Trust banks where ‘N’ is not sufficient enough to be estimated by using System GMM, we use fixed effects model instead.

The moment conditions are valid only if there is no serial correlation in the idiosyncratic errors. Because the first difference of independently and identically distributed idiosyncratic errors will be auto correlated, rejecting the null hypothesis of no serial correlation at order one in the first-differenced errors does not imply that the model is mis-specified. Rejecting the null hypothesis at higher orders implies that the

moment conditions are not valid. Hence, second-order autocorrelation tests are conducted to address the validity of our models. Sargan test of over-identifying restrictions are also conducted to ensure the validity of instrumental variables.

The dependent variables are three commonly used profitability measures: return on average equity (ROE), return on average asset (ROA) and net interest margins (NIM). ROE is measured as net income over equity, while ROA is measured by net income over assets. Net interest margins are defined as the differences between interest income and interest cost divided by net interest earning assets. Throughout the study the profit rate of bank  $i$  at time  $t$  ( $\pi_{i,t}$ ) is defined as the relative deviation from the sample mean at time  $t$ . Consequently,  $\lambda_i$  is a measure of the speed at which short-run profits converge toward long-run values, and this provides an estimate of the effectiveness of competition in eliminating positions of above or below average positions of profitability.<sup>iv</sup>

The vector of exogenous bank-specific regressors,  $X_{it}$  are as follows:

$\pi_{i,t-1}$  = previous profitability

DIV = diversification (non-interest income divided by total operating income)

LA = loans-to-assets ratio (net loans divided by total assets)

KA = capital to assets ratio (equity divided by total assets)

CI = cost-to-income ratio (total operating cost divided by total income)

IMP = the ratio of impaired loan to gross loans granted

MS = market share (the share of bank  $i$ 's assets as a % of the total assets of whole Japanese banking system)

The vector of country-specific regressors  $M_t$  are as follows:

HHI = the Herfindahl-Hirschman index of industry concentration (the sum of the squares of each bank's market shares)

GDPG = the real GDP growth of Japan.

MC = the percentage of market capitalisation of listed companies over GDP

#### **4. Data and Results**

Accounts data for all banks operating in Japan over the period 2000 to 2007 were collected from the Bankscope database produced by Bureau Van Dijk.<sup>v</sup> The final sample is an unbalanced panel with 4,899 average bank-year observations (685 banks).

#### **Insert Table 1 Descriptive statistics of bank profitability in Japan**

Table 1 presents descriptive statistics for three different profitability measures (ROE, ROA and NIM) by ownership type. Trust banks have the highest mean profitability for both ROE and ROA (4.95% and 1.11%), followed by Regional banks (with mean ROE and ROA of 1.80% and 0.14%, respectively). Second Association Regional banks, City banks and Other Cooperatives all fail to generate consistent positive profits, with Second Association Regional banks reporting the lowest ROE (-2.10%) and City banks reporting the lowest in ROA (-0.19%). The mean profitability of City banks is dominated by UFJ Bank Ltd, which generated negative ROA and ROE over the year 2000 through 2004. If we drop UFJ Bank Ltd, the mean ROE and ROA for City banks become positive, equal to 1.36% and 0.01%, respectively. The low profitability for Second Association Regional bank is not surprising since the

principal mission of Second Association Regional banks is to contribute to the social and economic development of the Japanese regions (LOUKOIANOVA, 2008). With regards to NIM, both Second Association Regional bank and Other Cooperative bank have high net interest margins (2.09% and 2.04%, respectively). Interestingly, Trust banks, which are the most profitable ownership type, have the lowest net interest margins (0.35%). As noted before, Trust banks focus on activities in the real estate market as well as specialising in offering clients' asset and wealth management services. Hence, traditional banking business is not the major source of revenue for Trust banks.

**<Insert Table 2 Summary statistics of explanatory variables>**

In Table 2 (panel a), the summary statistics on the other covariates that are used in our estimable model over the sample period are presented, while Table 2 (panel b) presents the summary statistics (mean) of these covariates by ownership type. As we can see from Table 2 (panel b), non-interest earning income (DIV) is the major source of income for Trust banks (78.97%), followed by City banks (30.05%). Other types of banks have lower proportionate levels of non-interest income, reflecting focus on traditional banking business. In fact, Other Cooperative banks have negative non-interest income, indicating their inefficiency in managing non-traditional banking business.

Trust banks have the highest capital to total assets ratio (23.3%), which is followed by City banks (10.01%). All other regional and cooperative banks have capital-asset ratios between 4% to 6%. Collectively, both Regional and Second Association Regional banks have higher loan-assets ratios than both Shinkin and Other Cooperative banks. This may reflect the fact that both regional banks are larger

in size and thus have more business opportunities in lending than their cooperative counterparts. Trust banks have the lowest loan-assets ratio. This also reflects a focus on asset and wealth management business rather than deposit taking and lending. City banks appear more efficient than other types of banks in terms of cost-to-income ratio, which is only slightly lower than 50 percent. Again, both Regional and Second Association Regional Banks appear more efficient than their Shinkin and Other Cooperative banking counterparts, indicated by their lower cost-to-income ratios. City banks have the lowest credit risks in terms of impaired loans to gross loans ratio (4.69%). Shinkin banks have the highest credit risks (9.92%) among all bank ownership types, perhaps due to placing members' requirements for finance above prudent risk management.

**Insert Table 3 Empirical Results: Determinants of Profitability (ROE) of Japanese banks**

**Insert Table 4 Empirical results: Determinants of Profitability (ROA) of Japanese banks**

**Insert Table 5 Empirical results: Determinants of Profitability (NIM) of Japanese banks**

Equation (1) is estimated across the six different ownership types. Table 3 presents the results for our ROE measure. Tables 4 and 5 present results for our ROA and NIM measures of bank performance. In each table, we estimate System GMM regressions for each ownership type, except for City banks and Trust banks, where fixed effects estimation is employed (due to the small number of cross sectional observations). The last column of Table 3, 4 and 5, presents a whole sample analysis

of the determinants of profitability. Diagnostic tests are conducted for both the validity (using the Sargan test) of the overall instruments and models (via the second-order autocorrelation test) used.

The estimated persistence of profit coefficients  $\lambda$  reported in Tables 3 to 5 show that they are significant in virtually most cases. Table 3 shows the results using ROE as a proxy for bank performance. In all sets of estimations there are quite large differences between ownership types in the magnitudes of the persistence coefficients ranging from a low of 0.096 (Other Cooperatives) to a high of 0.264 (Shinkin banks). It is interesting to note that Shinkin banks are simply larger counterparts of Other Cooperatives, and as such may be allowed to operate in more than one prefecture. Although under prudential regulation with not-for-profit nature, Shinkin banks enjoy some benefits relative to their City and Regional Banking counterparts, including paying lower rates of tax on any profit (surplus), lower fees on licences and registration for the opening of new offices. All these benefits may translate to better ability to sustain profits from year to year. On the other hand, Other Cooperatives can only operate in single prefecture and provide limited services to member firms and individuals due to its size disadvantage. Hence, these Credit Cooperatives have less ability to sustain their profits over a sustained period.

In most cases, profits persistence is more pronounced for our ROE measure than our ROA measure (see Table 4). The profit (ROA) persistence coefficient is only significant for the Second Association Regional Bank (0.054). This could be because the former is more easily manipulated by senior management via stock buy-backs, new issues, changes in provisioning practices, shareholder value strategies and so on, or simply by adjusting retained earnings. Pooling our sample across ownership types

and re-estimating equation (1) gives a  $\lambda$  estimate of 0.118 for ROE and 0.066 for ROA.

Consistently robust profit persistence coefficients are found in Table 5 when NIM is used as a measure of bank performance. Again, Shinkin banks have the highest persistence level of 0.69 while Other Cooperatives have the lowest level of 0.438, albeit that the differences between different ownership types are small. Pooling the sample across ownership types gives a  $\lambda$  estimate of 0.656 for the NIM measure of bank performance.<sup>vi</sup>

The empirical results provide conflicting signs for the effect of diversification on bank profitability. Significantly positive coefficients are found for Second Association Regional banks and Shinkin banks for both ROE and ROA, while a negative sign is found for Other Cooperatives when ROA is used as the profitability measure. More interesting is that diversification measure enters all regressions significantly and negatively when NIM is used. The negative relationship between diversification effects and net interest margins means banks with higher product diversification (higher non-operating-income weight) exhibit lower interest margins. This is consistent with the view that better diversified banks are better able to cross-subsidize their lending business with revenues generated from non-interest lines of business. While the positive relationship found between fee generating behaviour and profitability (ROE and ROA) in Second Association Regional banks and Shinkin banks is not necessarily contradictory with the negative relationship found in the NIM equations. These banks may use income earned from non-interest generating activities to reduce margins. While for Other Cooperatives, small size necessitates management to concentrate on traditional banking business via deposit taking and lending activities. Diversifying product provision through non-interest income generating business may

lead to mistakes being made resulting in losses in both non-interest income and net interest margins.

The capital-assets ratio (KA) is positive and significant in most regressions. Table 5, however, reports significantly negative relationship between capital-assets ratio and bank net interest margins in Shinkin banks and City banks. Since Shinkin banks do not issue equity, their capital base comprises of the retention of surpluses. If the surpluses accumulate to a certain level, Shinkin banks may begin to lower their net interest margins to benefit member firms and individuals. City banks, on the other hand, have a diversified client basis and product portfolio offering a wide variety of services including various non-interest earning activities such as private banking and asset management. Hence, an increase in capital may enhance City banks' stability, encouraging bank managers to take riskier businesses through lowering net interest margins.

The loans-to-assets ratio (LA) enters most of profit (ROE and ROA) regressions insignificantly. This implies that banks' liquidity conditions do not impact on profitability. However, significantly positive signs are found in NIM regressions for most ownership types except City and Trust banks. This indicates a negative relationship between liquidity ratio and net interest margins, since high loans-to-assets ratio means low liquidity. This is consistent with previous literature. A bank with relatively more liquid assets is better prepared to meet these unforeseen contingencies (Berger and Bouwman, 2009). Liquidity stored in a bank's balance sheet also serves as a cushion or buffer against losses arising from the 'fire-sale' of assets to meet liquidity need. Hence, sufficient liquidity may mean less liquidity risk, which may reduce interest margins due to a lower premium charged on loans (AFANASIEFF et al, 2002).

Cost-to-income ratio (CI) is found to have negative effects on profitability across different ownerships for all profitability measures (ROE, ROA and NIM), implying that banks with efficient management are more able to reduce costs, which feed through to higher profits. This result is consistent with much of the previous empirical banking literature (see BERGER, 1995; GODDARD et al, 2001).

A negative relation between credit risk (IMP) and profitability (ROE and ROA) is found across all ownership types. This is consistent with the view that banks in Japan with higher credit risks be less profitable (see UCHIDA and NAKAGAWA, 2007). While in NIM regressions, significantly positive relationships are found for Regional, Second Association Regional, Shinkin and Other Cooperative banks, but not City and Trust banks. The risk of non-repayment or default on a credit (credit risk) requires banks to apply a risk premium implicitly to interest rates charged for their operations. Furthermore, to better manage increasing credit risk, banks may incur additional expenses to intensify their monitoring of loans (BARAJAS et al, 1999). Thus, banks tend to require higher net interest margins to compensate for higher credit risks.

Table 3 and 4 present similar results for the relationship between market share (MS) and profitability (ROE and ROA). A negative relationship is found for Regional and Second Association Regional banks, and a positive relationship for Shinkin banks and Other Cooperatives. This may imply that although small in size, both types of regional banks have already been operating under economies of scale within their respective markets, and any additional growth in market shares cannot bring them additional profits. On the other hand, since both Shinkin and Other Cooperative banks are likely to operate below the minimum efficient scale (0.04% and 0.01% market shares respectively - Table 2, panel b), an increase in market shares for both types of

cooperative banks may enable these banks to benefit from declining average costs (economies of scale), which feed through to increased profitability.

Table 5 also reports a negative relationship between market share and net interest margins across ownership types, albeit that the coefficients for City and Trust banks are not significant. In order to compete with their larger counterparts, smaller banks (which can often lack business opportunities) often extend credit to more risky customers. To compensate the consequently higher credit risk faced by these smaller banks, however, they tend to charge higher risk premiums, reflected by a higher net interest margins. On the other hand, larger banks may set lower margins due to economies of scale or that these banks may use their high market shares to engage in predatory behaviour by reducing short run margins in order to eliminate rivals in the long run. City and Trust banks may have already been operating under economies of scale and the changes in market share do not have effective impact on their profitability and net interest margins setting decisions.

The impact of bank concentration (HHI) on bank profitability is mixed. A significantly negative relationship between concentration (HHI) and profitability is found for Regional, Shinkin and Other Cooperative banks. A significantly positive relationship is found for Second Association Regional Banks, while no significant relationship is apparent for City and Trust banks. When pooling the whole sample together, negative signs for HHI in all profitability equations (ROE, ROA and NIM) are found. These results indicate that industry structure does impact on bank profitability, but the directions (and the degree) are not the same across ownership structures.<sup>vii</sup>

The signs for real GDP growth are conflicting across ownership types and profitability measures. However, when pooling the whole sample together, the signs

are negative for all profitability regressions. These results at least partly support the view that high economic growth improves business environment and lowers bank entry barriers. The consequently increased competition dampens banks' profitability.

Market capitalisation (MC) enters all ROE and ROA regressions significantly and negatively, except for City and Trust banks<sup>viii</sup>. The ratio of market capitalisation of listed companies over GDP reflects, to some extent, the whole country's business cycle. A high market capitalisation ratio means economic expansion, and the easy access for firms to finance through stock markets reduces banks' business opportunities, resulting in a decrease in profits. This is consistent with the view of Miller-Modigliani theorem, which states that, in the absence of taxes and bankruptcy costs, debt and equity finance are purely substitutes. Given that bank deposits are the major form of Japanese individual investors' wealth, the improvement of stock market as well as more sophisticated financial products, such as asset-backed securities and real estate investment trusts, will undoubtedly take away bank deposits and leads to reduced business opportunities. The significantly positive relationships found between market capitalisation and NIM in City and Trust banks, however, may indicate that these types of banks have more control over customers and face less elastic demand curves.

## **5. Summary**

This paper has reported the results of an investigation as to the determinants and persistence of profitability of Japanese banks over the period 2000-2007. The results of the empirical analysis suggest that there is significant persistence of profits from one year to the next. There is some variation between ownership types in the extent to which competition eliminates positions of abnormal profitability. Shinkin

banks have the highest profits persistence. Perhaps due to regulatory limits placed on the scale and geographical scope of their activities, other Cooperatives have the least ability to maintain their profitability from one year to the next.

The empirical results for diversification-profits relationships are conflicting across ownership types. However, better diversified banks are better able to reduce margins to cross-subsidize their lending business by revenues earned by non-interest generating activities. The positive relationship between the capital-assets ratio and ROE and ROA implies that managers use capital strength as a device to send signals about expected future profitability. The negative relationship between capital-assets and NIM in Shinkin banks may mean that as the equity base accumulates, Shinkin banks start to lower their net interest margins to benefit member firms and individuals. For City banks a higher capital ratio may provide the necessary stability to lowering net interest margins. Efficient banks with less credit risks are more profitable than their competitors. Market share is found to have negative impact on both types of regional banks, but a positive impact on Shinkin and Other Cooperative banks.

Industry structure is found to have different impact on banks with different ownership types. The impacts of real GDP growth on bank profitability are conflicting across ownership types but there is some evidence that the growth of GDP may induce competition, resulting in a decrease of bank profits. There is also evidence of negative impact of stock market development on the profitability of Regional, Second Association Regional, Shinkin and Other Cooperative banks, but this relationship does not hold for City and Trust banks.

Overall, these results are of interest to policy makers and government agencies monitoring competition, as they suggest that while profits converge to long run values, this process is by no means instantaneous, and tends to differ by ownership

type. Furthermore, the results suggest that policies which encourage some bank ownership types to diversify their revenues streams, improve their capital levels and lower costs relative to income could generate significant welfare gains for the banking industry in Japan. Overall, the results of the analysis presented above suggest differences in the performance between those banks with a regional focus (Regional, Second Association Regional, Shinkin and Other Cooperatives) and their nationwide counterparts (City and Trust banks).

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**Table 1 Descriptive Statistics for Profitability Measures by Ownership Type**

Ownership	Number of Obs.	ROE		ROA		NIM	
		Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Regional Banks	463	1.80	3.71	0.14	0.18	1.71	0.09
Second Association Regional Banks	361	-2.10	6.22	-0.03	0.21	2.09	0.11
Shinkin Banks	2233	0.61	2.21	0.06	0.11	1.90	0.12
Other Cooperatives	1334	-2.03	3.87	0.01	0.12	2.04	0.11
City Banks	46	-1.89	17.75	-0.19	0.82	1.12	0.16
Trust Banks	109	4.95	7.42	1.11	1.36	0.36	0.04

**Table 2 Summary Statistics: Explanatory Variables**

Panel a:

Entire Sample

	<b>Number of Observations</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Median</b>
DIV	4090	4.61	50.59	5.17
KA	4103	5.79	3.67	5.18
LA	4084	53.06	14.07	54.20
CI	4081	74.34	24.48	73.42
IMP	3898	8.65	5.77	7.96
MS	4103	0.16	0.87	0.02
HHI	4103	481.85	9.86	477.93
GDPG	4789	1.73	0.99	1.93
MC	4789	79.14	20.24	71.90

Panel b:

Ownership type

	DIV	KA	LA	CI	IMP	MS
Regional Bank	11.48	4.90	64.94	67.24	5.75	0.36
Regional tier 2 Bank	5.87	4.16	70.72	69.6	7.2	0.13
Shinkin Bank	4.88	5.64	51.9	75.58	9.92	0.04
Other cooperative bank	-2.86	4.81	48.61	75.78	6.92	0.01
City Bank	30.05	10.01	56.85	49.55	4.69	8.15
Trust Bank	78.97	23.30	37.21	66.78	6.48	0.79
Total	4.75	5.70	53.66	73.92	8.36	0.16

**Table 3 Determinants of Profitability (ROE) of Japanese Banks**

	System GMM: Two Step				Fixed Effects		System GMM: Two Step
	Regional Banks	Second Association Regional Banks	Shinkin Banks	Other Cooperatives	City Banks	Trust Banks	Overall
Lambda	0.239*** (0.001)	0.163*** (0.000)	0.264* (0.073)	0.096** (0.015)			0.118*** (0.000)
DIV	-0.047 (0.304)	0.393*** (0.000)	0.066*** (0.008)	-0.026 (0.500)	-0.084 (0.884)	0.109 (0.816)	0.007 (0.768)
KA	0.731*** (0.000)	3.643*** (0.000)	0.703*** (0.000)	0.495** (0.046)	17.96** (0.040)	-2.186 (0.573)	0.823*** (0.000)
LA	-0.097** (0.022)	-0.024 (0.813)	-0.005 (0.841)	-0.004 (0.901)	-1.159 (0.527)	1.943* (0.073)	-0.003 (0.871)
CI	-0.295*** (0.000)	-0.281*** (0.000)	-0.029 (0.376)	-0.180*** (0.000)	-1.736** (0.020)	0.357 (0.595)	-0.104*** (0.001)
IMP	-1.557*** (0.000)	-1.640*** (0.000)	-0.453*** (0.000)	-0.250*** (0.000)	-2.408 (0.238)	-0.225 (0.498)	-0.364*** (0.000)
MS	-6.810*** (0.000)	-12.40** (0.010)	9.417* (0.052)	8.068*** (0.001)	-7.545 (0.195)	8.931 (0.475)	-0.469 (0.115)
HHI	-0.073*** (0.000)	0.044** (0.029)	-0.065*** (0.000)	-0.086*** (0.003)	-0.190 (0.445)	0.046 (0.823)	-0.057*** (0.000)
GDPG	-0.339 (0.265)	1.228*** (0.000)	-0.548** (0.045)	-0.158 (0.749)	-4.302 (0.450)	6.332* (0.062)	-0.070 (0.721)
MC	-0.074*** (0.000)	-0.121*** (0.000)	-0.042** (0.034)	-0.084*** (0.000)	0.006 (0.982)	0.356 (0.201)	-0.045*** (0.000)
_cons	76.51*** (0.000)	-0.165 (0.991)	37.87*** (0.000)	62.29*** (0.000)	257.0 (0.214)	-189.9 (0.139)	37.87*** (0.000)
Number of banks	63	54	335	184	11	8	652
Number of obs.	420	324	1988	1011	42	38	3817
Sarganp	0.09	0.11	0.26	0.29			0.07
AR(2)	1.00	0.69	0.30	0.64			0.43

The dependent variable is ROE after normalization. System GMM estimator is applied to Eq(1) for Regional, Second Association Regional, Shinkin, Other Cooperative banks as well as the whole banking system (Overall). While due to the data restrictions, fixed effects estimator is applied to Eq(1) for City and Trust banks. 'Sarganp' is the p-value of the Sargan test statistic of over-identifying restrictions, while AR(2) is the p-value of the second order autocorrelation test statistic. P-values of the estimated coefficients are reported in brackets. Year dummies from 2001 through 2007 are included in the model when system GMM estimator is used but not reported in the table. \*, \*\*, and \*\*\* represent 10, 5 and 1 percent significance level, respectively.

**Table 4 Determinants of Profitability (ROA) of Japanese Banks**

	System GMM: Two Step				Fixed Effects		System GMM: Two Step
	Regional Banks	Second Association Regional Banks	Shinkin Banks	Other Cooperatives	City Banks	Trust Banks	Overall
Lambda	0.052 (0.204)	0.054*** (0.009)	-0.107 (0.652)	0.007 (0.818)			0.0661*** (0.009)
DIV	0.001 (0.806)	0.012*** (0.000)	0.0023* (0.075)	-0.002** (0.050)	0.006 (0.808)	-0.007 (0.768)	0.000 (0.955)
KA	0.047*** (0.000)	0.141*** (0.000)	0.050*** (0.000)	0.038*** (0.000)	0.386 (0.100)	-0.112 (0.572)	0.053*** (0.000)
LA	-0.001 (0.490)	-0.004 (0.269)	-0.001 (0.515)	-0.001 (0.360)	0.091 (0.191)	0.086 (0.108)	-0.001 (0.330)
CI	-0.009*** (0.000)	-0.015*** (0.000)	-0.007*** (0.000)	-0.008*** (0.000)	-0.144*** (0.000)	-0.002 (0.958)	-0.007*** (0.000)
IMP	-0.057*** (0.000)	-0.076*** (0.000)	-0.0301*** (0.000)	-0.0155*** (0.000)	-0.172 (0.072)	-0.011 (0.541)	-0.017*** (0.000)
MS	-0.108* (0.071)	-0.474*** (0.009)	0.538** (0.013)	0.139 (0.200)	0.125 (0.633)	0.341 (0.610)	-0.027** (0.040)
HHI	-0.001*** (0.000)	0.002*** (0.001)	-0.001 (0.324)	-0.002** (0.032)	-0.014 (0.257)	-0.004 (0.714)	-0.001* (0.092)
GDPG	-0.036*** (0.001)	-0.007 (0.576)	-0.073*** (0.001)	-0.012 (0.583)	0.109 (0.625)	0.360** (0.033)	-0.032*** (0.000)
MC	-0.003*** (0.000)	-0.006*** (0.000)	-0.003*** (0.004)	-0.003*** (0.001)	-0.009 (0.448)	0.020 (0.166)	-0.002*** (0.000)
_cons	1.870*** (0.000)	0.735 (0.190)	1.250*** (0.002)	2.048*** (0.000)	7.243 (0.411)	-4.310 (0.510)	1.076*** (0.000)
Number of banks	63	53	335	182	11	8	649
Number of obs.	427	324	2000	1012	45	40	3843
Sarganp	0.11	0.15	0.29	0.29			0.09
AR(2)	0.65	0.54	0.80	0.57			0.98

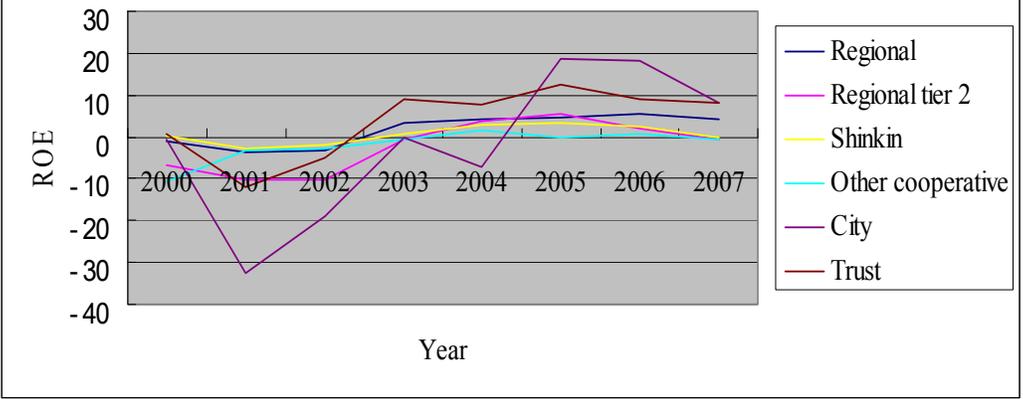
The dependent variable is ROA after normalization. System GMM estimator is applied to Eq(1) for Regional, Second Association Regional, Shinkin, Other Cooperative banks as well as the whole banking system (Overall). While due to the data restrictions, fixed effects estimator is applied to Eq(1) for City and Trust banks. 'Sarganp' is the p-value of the Sargan test statistic of over-identifying restrictions, while AR(2) is the p-value of the second order autocorrelation test statistic. P-values of the estimated coefficients are reported in brackets. Year dummies from 2001 through 2007 are included in the model when system GMM estimator is used but not reported in the table. \*, \*\*, and \*\*\* represent 10, 5 and 1 percent significance level, respectively.

**Table 5 Determinants of Net Interest Margins (NIM) of Japanese Banks**

	System GMM: Two Step				Fixed Effects		System GMM: Two Step
	Regional	Second Association Regional	Shinkin	Other Cooperative	City	Trust	Overall
Lambda	0.681*** (0.000)	0.623*** (0.000)	0.690*** (0.000)	0.438*** (0.000)			0.656*** (0.000)
DIV	-0.007*** (0.000)	-0.004*** (0.000)	-0.006*** (0.000)	-0.003*** (0.000)	-0.010*** (0.001)	-0.014*** (0.001)	-0.004*** (0.000)
KA	-0.004 (0.177)	0.005 (0.137)	-0.007*** (0.000)	-0.002 (0.631)	-0.054** (0.024)	-0.048 (0.156)	-0.004** (0.015)
LA	0.004*** (0.000)	0.005*** (0.000)	0.006*** (0.000)	0.011*** (0.000)	-0.003 (0.656)	0.010 (0.253)	0.005*** (0.000)
CI	-0.007*** (0.000)	-0.005*** (0.000)	-0.006*** (0.000)	-0.004*** (0.000)	-0.008*** (0.002)	-0.012* (0.054)	-0.004*** (0.000)
IMP	0.006*** (0.005)	0.010*** (0.000)	0.003** (0.005)	0.003*** (0.008)	-0.009 (0.349)	-0.004 (0.162)	0.005*** (0.000)
MS	-0.210*** (0.000)	-0.395*** (0.000)	-0.679*** (0.000)	-0.584*** (0.000)	-0.025 (0.350)	-0.138 (0.299)	-0.046*** (0.000)
HHI	-0.000 (0.264)	0.001** (0.025)	-0.000 (0.689)	-0.001*** (0.001)	0.000 (0.958)	0.002 (0.420)	-0.000 (0.312)
GDPG	-0.018*** (0.000)	-0.006 (0.325)	-0.000 (0.944)	-0.003 (0.689)	-0.076*** (0.002)	-0.044 (0.125)	-0.009*** (0.000)
MC	-0.000* (0.078)	-0.001*** (0.000)	0.000 (0.516)	0.001** (0.042)	0.003** (0.020)	0.007*** (0.008)	0.000 (0.736)
_cons	0.471*** (0.001)	-0.098 (0.495)	0.247** (0.030)	0.274 (0.117)	0.409 (0.642)	-1.045 (0.385)	0.161* (0.060)
Number of banks	64	53	342	183	11	8	685
Number of obs.	429	332	2007	1028	46	38	3876
Sarganp	0.40	0.22	0.47	0.10			0.00
AR(2)	0.89	0.75	0.47	0.56			0.86

The dependent variable is NIM after normalization. System GMM estimator is applied to Eq(1) for Regional, Second Association Regional, Shinkin, Other Cooperative banks as well as the whole banking system (Overall). While due to the data restrictions, fixed effects estimator is applied to Eq(1) for City and Trust banks. 'Sarganp' is the p-value of the Sargan test statistic of over-identifying restrictions, while AR(2) is the p-value of the second order autocorrelation test statistic. P-values of the estimated coefficients are reported in brackets. Year dummies from 2001 through 2007 are included in the model when system GMM estimator is used but not reported in the table. \*, \*\*, and \*\*\* represent 10, 5 and 1 percent significance level, respectively.

Figure 1 Profitability Trend by Ownerships



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<sup>i</sup> JENSEN and MECKLING (1976), FAMA (1980) and FAMA AND JENSEN (1983) suggest that a lack of capital market discipline weakens owners' control over management, leaving management free to pursue its own interests with few incentives to be efficient.

<sup>ii</sup> UCHIDA and NAKAGAWA (2007) show that Japanese city and regional banks has acted as a herd in the types of lending they engaged in over the period 1975-2000.

<sup>iii</sup> The empirical findings of the importance of regional/community banks to prevailing economic conditions can be found in MAUDOS and FERNANDEZ DE GUEVARA (2009).

<sup>iv</sup> Potential bias could arise from the use of accounting rates of return rather than economic profits. However, according to GEROSKI and JACQUEMIN (1988), persistently high accounting rates of return indicate persistently high economic rates of return. Hence, this bias is unlikely to be important in persistency studies. In the rest of this section we provide a brief rationale for the inclusion of our other independent variables.

<sup>v</sup> Banks reporting extreme values (larger than 99 percentile or smaller than 1 percentile of the sample) or very large unexplained changes in the profitability measures (4 standard deviations outside the average change) were excluded.

<sup>vi</sup> The significantly higher persistence level of NIM than ROE and ROA perhaps indicates that interest income is less volatile than non interest income.

<sup>vii</sup> The negative relationship between bank concentration and profitability has also been found by BERGER (1995) and CROWLEY (2007).

<sup>viii</sup> This result partly supports previous empirical findings that regional macroeconomic conditions have significant impact on banks with a regional focus. (see DALY et al 2003, WILLIAMS and GARDENER 2003, YEAGER 2004, FURLONG and KRAINER 2007, CIHAK and HESSE 2007, VAONA 2008).