Do Credit Associations Put Competitive Pressure on Regional Banks in Japanese Regional Lending Markets?

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ABSTRACT

This paper investigates whether credit associations put competitive pressure on regional banks in Japanese regional lending markets. It was found that credit associations pressure regional banks to set lower lending interest rates in regional markets. In addition, the competitive pressure from credit associations in a prefecture whose share of credit associations is more than 20% is much stronger than in a prefecture whose share of credit associations is less than 20%. In particular, regional banks in a prefecture whose share of credit associations is from 25% to 30% experience the strongest pressure.

Keywords: regional lending markets, regional banks, credit associations, lending interest rates, competitive pressure.

JEL Classification: G21

1. Introduction

In Japan, there are regional banks that are corporations, and cooperative financial institutions that are non-profit organizations. Both types of regional financial institutions can have deep roots in local communities. The former must seek profit maximization for stock holders. On the other hand, because of the nature of their organizations and because they receive privileges from the government, the primary objective of the cooperative financial institutions is not to seek profit. Because both types undertake the same financial functions, the two different types of financial institutions coexist and do businesses in Japanese regional lending markets.

Furthermore, among cooperative financial institutions some credit associations are equal in size to or are larger than regional banks. If such credit associations put competitive pressure on regional banks in regional lending markets, privileges granted by the government to credit associations are biased against regional banks. When viewed objectively, competitive conditions should be unbiased between them. Because many non-Japanese studies have previously examined the competitive relationship between banks and non-profit financial institutions, we should clarify the relationships between banks and credit associations and consider how to treat credit associations going forward.

In the present study, we empirically investigate whether the presence of credit associations in regional lending markets pressures regional banks to set low lending interest rates in Japan. The remainder of the paper is structured as follows. In Section 2, previous studies that analyzed the competitive relationships between banks and non-profit financial institutions are surveyed. In Section 3, theoretical frameworks are shown and empirical models and data are explained. In Section 4, empirical results are interpreted. The final section provides summary and conclusions.

2. Literature Review

Emmons and Schmid (2000) investigated whether banks and credit unions compete in a regional deposit market by using country level data in the US. They concluded that these are competitive relationships. Tokle and Tokle (2000) analyzed whether banks compete with savings and loans (S&Ls) and credit unions by using banks deposit rates in Idaho. They found that banks compete with these institutions, and that the competition with credit unions was more severe than with S&Ls.

Feinberg (2001) examined the effects of credit unions on banks by using the data for local lending markets in the US. This study showed that banks in a region whose share of credit unions is higher set lower lending rates. Feinberg and Rahman (2001) analyzed the competitive relationship between banks and credit unions using a Granger-causality test. They demonstrated that the both credit union and bank loan rates are found to cause the other. Feinberg (2003) investigated the determinants of

bank lending rates by using both market data and bank data. This study revealed that the presence of credit unions negatively affects bank lending rates.

Hannan (2003) examined the competitive impacts of credit unions on banks and thrift institutions in regional deposit markets, and demonstrated that the presence of credit unions positively affects bank and thrift deposit rates. Schmid (2005) analyzed whether the share of credit unions in a regional market affects deposit market concentrations. This study showed that although those tendencies had been found from 1990 to 2000, they have not been seen since 2001. Cohen and Mazzeo (2007) investigated competitive relationships among multimarket banks, single-market banks, and thrift institutions in deposit markets of the US. They found that competition among the same types of financial institutions is greater than those among different types, and that in most cases thrifts appear to be competitively distinct from both multimarket banks and single-market banks.

3. Methodology and Data

3.1 Methodology

In the present study, we use the same theoretical framework as in Feinberg (2001, 2003). In imperfect competition models, an increase of fringe suppliers in a market will bring lower prices. When we apply this to Japanese regional lending markets, an increase of credit associations as fringe suppliers disciplines banks as relative dominants to set lower lending rates. To formalize this, we use a modified version of the dominant firm-price leadership model.

When we assume demand for loans as a homogeneous product, and credit associations acting as fringe suppliers, the Lerner Index of banks can be presented as follows[1]:

$$LI = \frac{kConcentration}{|\eta| + \varepsilon_{CAshare} CAshare} \tag{1}$$

Concentration is the index of market concentration and *CAshare* is the market share of credit associations. From equation (1), it can be observed that the larger the share of credit associations in a market, the lower the Lerner Index, which, here, is the lending rate of banks. The objective of the present study is to empirically investigate whether this tendency is found in Japanese regional lending markets.

In the present study, we define equation (2) by ordinary least squares, based on the theoretical frameworks previously mentioned. White diagonal standard errors and covariance are used. The sample population comprises regional banks and pooled data from 2005 to 2010.

[1] See Feinberg (2001, 2003) for the derivation of equation (1).

$$Interestrate_{it} = c_0 + c_1\, Concentration_{it} + c_2\, CAshare_{it} + c_3\, Marketshare_{it} +$$

$$c_4\, logDeposit_{it} + c_5\, HoldingDum_{it} + c_6\, Callrate_{t-0.25} \qquad (2)$$

Subscript i refers to bank i and subscript t refers to year t. *Interestrate* is lending interest rates and is calculated by dividing the interests on loans and discounts by loans and bills discounted (average balances).

Concentration is the degree of market concentration in a prefecture where the headquarters of bank i is located. We use the Herfindahl-Hirschman index (*HHI*) as a proxy for *Concentration*. *HHI* is calculated by using the deposit data of first- and second-tier regional banks and credit associations whose headquarters are located in the same prefecture as the headquarters of bank i. However, the deposit data of the banks and credit associations used to calculate *HHI* also include deposits gathered outside the headquarters prefecture. Furthermore, deposit data of large banks, i.e., city banks and trust banks, cannot be used to calculate *HHI*. Therefore, *HHI* is not necessarily an accurate measure of market concentration. Hence, we also use the deposit share of the largest banks in a prefecture. This is calculated by dividing the deposit of the largest bank by the sum of the deposits of large banks, first- and second-tier regional banks, and credit associations in a prefecture as a proxy for *Concentration*[2]. If competition in highly concentrated regions is weaker, the coefficient of *Concentration* will take a positive sign.

CAshare is the market share of credit associations in a prefecture where the headquarters of bank i is located. The study uses the following as proxies for *CAshare*: (1) the ratio of deposits held by credit associations in a prefecture to the sum of those held by large banks, first- and second-tier regional banks, and credit associations in that prefecture; (2) the ratio of branches of credit associations in a prefecture to the sum of those of large banks, first- and second-tier regional banks, and credit associations in that prefecture; and (3) the ratio of the sum of the members of credit associations whose headquarters are located in a prefecture where the headquarters of bank i is located to the population over 20 years old in that prefecture. If credit associations pressure regional banks to set lower lending rates in regional markets, the coefficient of *CAshare* will be negative.

Marketshare is a proxy for the market share of bank i. Specifically, it is calculated by dividing the deposit held by bank i in a prefecture where its headquarter is located by the sum of the deposits held by large banks, first- and second-tier regional banks, and credit associations in that prefecture. If banks with a larger share in a regional market act oligopolisticly, the coefficient of *Marketshare* will be positive. On the other hand, there is a possibility that banks with a larger share in a regional market will deal with other banks in a non-oligopolistic fashion because of the good standing,

[2] Feinberg (2001, 2003) used top 2 shares in a regional market as a proxy for the degree of market concentration. However, we use *Top 1 share* because there are prefectures that disclose only the top 1 bank in Japan and thus, samples become smaller by using top 2 shares.

bargaining power and dealing with enterprises of good standing. If banks with a larger share in a regional market set lower risk premiums because of such reasons, it is possible that the coefficient of *Marketshare* will be negative.

Deposit is the deposit balances of bank *i*, and is a proxy for scale. If larger banks enjoy economies of scale, those banks might return the reduced costs to their customers by setting lower lending rates. If so, the coefficient of *Deposit* will take a negative sign. This variable is converted into a natural logarithm.

HoldingDum is a dummy variable that takes the value of 1 when a bank is affiliated with a bank holding company, and takes the value of 0 when a bank is an independent bank. If banks that are affiliated with bank holding companies can realize efficiencies, they might reflect these in lending rates. If so, the coefficient of *HoldingDum* will be negative.

Callrate is the call money rate in the previous quarter. If banks set lending rates to be consistent with market rates, the coefficient of *Callrate* will be positive.

3.2 Data

Data for the financial statements of individual banks and credit associations are taken from the Nikkei NEEDS. Data absent in Nikkei NEEDS is supplemented from the "Analysis of Financial Statements of All Banks," edited by the Japanese Bankers Association, and "Financial Statements of All Credit Associations," edited by Consultant of Financial Books Co. Ltd. Data on deposit balances and branches of individual banks in a prefecture where their headquarters are located, and data of prefectural deposit balances and branches, are obtained from the "Financial Map," edited by Japan Financial News Co. Ltd. Data on members of credit associations are quoted from "Financial Statements of All Credit Associations." Data on prefectural population is obtained from the "Financial Resources of a Nation" (Minryoku), edited by Asahi Newspaper. Data on call money rates are acquired from the homepage of Bank of Japan.

Descriptive statistics on the data used in the present study are in Table 1.

Table 1. Descriptive Statistics

4. Empirical Results

4.1 Results of the Basic Model

In this section, we apply equation (2). Table 2 shows the three calculation results, as mentioned in section 3: (1) the case where the proportion of deposits held by credit associations in a prefecture is taken as a proxy for *CAshare*, (2) the case where the proportion of branches of credit associations in

a prefecture is taken as that proxy, and (3) the case where the proportion of members of credit associations in a prefecture is taken as that proxy.

Table 2. Calculation Result 1

In all of the three cases, the coefficients of *CAshare* are negative and significant at the 1% level. Regional banks located in a prefecture where the shares of credit associations are higher set lower lending rates; the presence of credit associations in a regional lending market puts competitive pressure on regional banks.

As a proxy variable of market concentration, the coefficients of *HHI* are insignificant in all cases; however, the coefficient of *Top1share* in the case of Deposit share is significantly positive at the 5% level[3]. It is impossible to calculate an accurate *HHI* for Japanese prefectural markets because of the limitations on disclosed data. Therefore, if *Top1share* is more credible than *HHI*, there is a possibility that regional banks in more concentrated markets set oligopolistic lending rates.

The coefficients of *Marketshare* are negative and significant at the 1% level in all cases. It therefore can be concluded that regional banks with a larger share in a regional market do not act oligopolisticly. The possibility that they set lower lending rates because they can raise adequate profits or that they are dealing with enterprises of good standing can be inferred.

The coefficients of *Deposit* in all calculations take significantly negative values at the 1% level. Because larger regional banks can reduce their costs, it can be considered that they still can achieve profits with lower lending rates.

The coefficients of *Callrate* are significant and positive at the 1% level in all calculations. It can be inferred that regional banks set lending rates by considering market rates.

The study assumes that the presence of credit associations does not influence lending rates to large companies set by regional banks because credit associations generally do not lend to large companies. In other words, credit associations might put competitive pressure on lending to SMEs and individuals by regional banks. We therefore apply equation (2) by assigning lending rates to SMEs and individuals to *Interestrate*.

The method used to calculate lending rates to SMEs and individuals is as follows. We assign to the denominator loans to SMEs and individual customers (average balances) that are disclosed. In addition, we regard long-term prime rates as lending rates to large companies, and calculate the interest on loans and discounts to large companies by using long-term prime rates (loans and bills

[3] We used *Top2share* instead of *Top1share* as in Feinberg (2001, 2003) and equation (2). In addition, the coefficient of *Top2share* in the case of Deposit share takes significantly positive values at the 10% level in those calculations.

discounted loans to SMEs and individual customers). Then we regard interest on loans and discounts minus interest on loans and discounts to large companies calculated as mentioned before as interest on loans and discounts to SMEs and individual customers and place them in the numerator.

The calculated results using lending rates to SMEs and individuals as *Interestrate* are in Table 3.

Table 3. Calculation Result 2

In addition, the coefficients of *CAshare* in these calculations take significantly negative values at the 1% level as in Table 2[4]. We can confirm that the presence of credit associations in a regional lending market puts competitive pressure on the setting of lending rates by regional banks even in the case that we limit the analysis to the assignment of lending rates to SMEs and individuals. On other variables, we find results similar to those in Table 2.

4.2 Results Using Share Dummies of Credit Associations

Let us apply equation (2) by using share dummies of credit associations instead of *CAshare*. Specifically, the following are used as independent variables: *Dum30*, giving 1 to prefectures whose deposit shares of credit associations are more than 30%; *Dum25*, giving 1 to those that are from 25% to 30%; *Dum20*, giving 1 to those that are from 20% to 25%; *Dum15*, giving 1 to those that are from 15% to 20%; and *Dum10*, giving 1 to those that are from 10% to 15%.

Table 4. Calculation Results (The Case that includes CA share Dummy)

Let us first see the results on "Total." The coefficients of *Dum30*, *Dum25*, and *Dum20,* which are over both the average and the median of deposit share of credit associations are under −17%; those of *Dum15* and *Dum10* are greater than −14%. Hence, it can be inferred that regional banks in a prefecture whose share of credit associations are more than 20% offer lower lending rates than those are under 20%.

In addition, it is notable that the coefficient of *Dum25* is the greatest, that of *Dum20* follows it, and that of *Dum30* is not the greatest among the dummy variables more than *Dum20*. It can be inferred that the competitive pressure of credit associations on setting lending rates by regional banks in a

[4] It cannot be denied that structures have largely changed since the period 2005 to 2010. Therefore, we also tried cross section calculations by using deposit share of CA as *CAshare*. Standard errors are White heteroskedasticity-consistent errors. As was expected, the coefficients of *CAshare* take significantly negative values in all years.

prefecture whose share of credit associations is from 25% to 30% is the strongest, and that in a prefecture whose share of credit associations is from 20% to 25% is the second strongest.

The same tendencies can be observed in the calculation results even in the case of lending rates to SMEs and individuals.

5. Concluding Remarks

This paper empirically examined the competitive relationships between regional banks and non-profit credit associations in Japanese regional lending markets.

Through this examination, we first conclude that credit associations put competitive pressure on regional banks in regional lending markets. In addition, it is clear that the competitive pressure of credit associations in a prefecture whose share of them is more than 20% is much stronger. Furthermore, it appears that the competitive pressure of credit associations in a prefecture where their share is from 25% to 30% is the strongest, while a share of over 30% does not necessarily create the strongest pressure.

The investigation of competitive relationships among the same types of financial institutions in regional lending markets remains for future analysis.

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Table 1. Descriptive Statistics

	Interestrate	*SMEs Interestrate*	*Top1share*	*HHI*	*CA Depositshare*
Mean	2.221	2.254	40.585	4005.340	16.953
Median	2.165	2.208	44.274	4016.699	15.391
Maximum	4.261	4.669	70.720	27317.090	35.506
Minimum	1.477	1.400	1.044	598.785	3.800
Std. Dev.	0.360	0.421	16.859	2050.360	8.295
Observations	656	656	656	656	656

CA Membershare	*CA Branchshare*	*Marketshare*
8.430	32.425	25.425
7.240	31.307	18.903
22.038	56.649	70.720
1.259	9.314	0.400
4.250	11.433	19.563
656	656	656

Table 2. Calculation Result 1

CAshare	Deposit share of CA		Branch share of CA		Member share of CA	
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	4.166*** (12.223)	4.715*** (22.938)	4.274*** (12.044)	4.682*** (22.693)	4.513*** (12.360)	4.889*** (23.045)
Top1share	0.003** (2.035)		0.002 (1.398)		0.002 (1.095)	
HHI		0.000 (0.195)		0.000 (0.068)		−0.000 (−0.601)
CAshare	−0.011*** (−7.034)	−0.011*** (−6.430)	−0.006*** (−6.372)	−0.006*** (−6.251)	−0.010*** (−3.236)	−0.010*** (−3.429)
Marketshare	−0.008*** (−6.771)	−0.006*** (−7.899)	−0.008*** (−6.310)	−0.006*** (−8.458)	−0.006*** (−5.142)	−0.005*** (−6.941)
Deposit	−0.119*** (−5.377)	−0.154*** (−10.271)	−0.124*** (−5.356)	−0.150*** (−9.992)	−0.150*** (−6.244)	−0.173*** (−11.348)
HoldingDum	0.005 (0.161)	0.008 (0.274)	0.012 (0.427)	0.015 (0.512)	−0.008 (−0.318)	−0.006 (−0.235)
Callrate	0.190*** (3.134)	0.191*** (3.143)	0.184*** (2.953)	0.185*** (2.963)	0.192*** (3.027)	0.193*** (3.039)
Adjusted-R^2	0.438	0.432	0.410	0.407	0.390	0.388
Observations	656	656	656	656	656	656

Notes1: *Significance at the 10% level; **Significance at the 5% level; ***Significance at the 1% level.

Notes2: White diagonal standard errors and covariance are used.

Table 3. Calculation Result 2

CAshare	Deposit share of CA		Branch share of CA		Member share of CA	
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	4.493*** (11.748)	5.159*** (21.840)	4.617*** (11.587)	5.108*** (21.478)	4.918*** (12.026)	5.371*** (22.088)
Top1share	0.004*** (2.584)		0.003* (1.857)		0.002 (1.508)	
HHI		0.000 (1.373)		0.000 (1.142)		0.000 (0.531)
CAshare	−0.013*** (−7.695)	−0.013*** (−7.011)	−0.008*** (−6.996)	−0.008*** (−6.866)	−0.012*** (−3.541)	−0.013*** (−3.687)
Marketshare	−0.010*** (−7.189)	−0.007*** (−8.032)	−0.009*** (−6.701)	−0.007*** (−8.504)	−0.008*** (−5.480)	−0.006*** (−7.041)
Deposit	−0.135*** (−5.420)	−0.178*** (−10.318)	−0.140*** (−5.356)	−0.172*** (−9.861)	−0.173*** (−6.404)	−0.201*** (−11.477)
HoldingDum	0.017 (0.518)	0.021 (0.608)	0.027 (0.807)	0.029 (0.867)	0.001 (0.032)	0.003 (0.095)
Callrate	0.061 (0.864)	0.064 (0.889)	0.054 (0.738)	0.056 (0.759)	0.064 (0.860)	0.066 (0.880)
Adjusted-R^2	0.443	0.434	0.414	0.410	0.390	0.387
Observations	656	656	656	656	656	656

Notes1: *Significance at the 10% level; **Significance at the 5% level; ***Significance at the 1% level.

Notes2: White diagonal standard errors and covariance are used.

Table 4 Calculation Result (The Case that includes CAshare Dummies)

Interestrate	Total		SMEs and Individuals	
	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)	Coefficient (t-value)
Constant	5.130*** (18.676)	4.840*** (24.701)	4.832*** (13.574)	5.319*** (23.569)
Top1share	−0.002 (−0.014)		0.003** (2.212)	
HHI		0.000 (0.758)		0.000* (1.863)
Marketshare	−0.000*** (−4.159)	−0.005*** (−7.529)	−0.008*** (−6.707)	−0.007*** (−7.672)
Deposit	−0.189*** (−10.816)	−0.166*** (−11.620)	−0.161*** (−6.895)	−0.193*** (−11.753)
HoldingDum	0.018 (0.547)	0.005 (0.140)	0.019 (0.518)	0.019 (0.505)
Callrate	0.174*** (2.835)	0.174*** (2.882)	0.039 (0.549)	0.041 (0.578)
Dum30	−0.179*** (−2.926)	−0.201*** (−3.267)	−0.279*** (−4.377)	−0.257*** (−3.755)
Dum25	−0.329*** (−8.448)	−0.348*** (−8.942)	−0.410*** (−9.317)	−0.415*** (−9.222)
Dum20	−0.264*** (−7.015)	−0.270*** (−7.346)	−0.331*** (−7.371)	−0.331*** (−7.474)
Dum15	−0.116*** (−4.151)	−0.118*** (−4.213)	−0.158*** (−4.788)	−0.145*** (−4.348)
Dum10	−0.132***	−0.139***	−0.193***	−0.181***

	(−4.195)	(−4.387)	(−5.205)	(−4.859)
Adjusted-R^2	0.433	0.451	0.458	0.454
Observations	656	656	656	656

Note1: *Significance at the 10% level; **Significance at the 5% level; ***Significance at the 1% level.

Notes2: White diagonal standard errors and covariance are used.

Note2: “Total” indicates that *Interestrate* is calculated by dividing the interest on loans and discount by loans and bills discounted (average balances). “SMEs and Individuals” indicates that *Interestrate* is calculated by dividing interests on loans and discounts to SMEs and individual customers by loans to SMEs and individual customers (average balances).