**タイトル**
The Role of Relationship Banking on the Performance of Japanese Firms: An Empirical Study on Small and Medium Enterprises

**著者**
内田 滋

**引用**
長崎大学東南アジア研究年報 vol.46, p.13-21; 2005

**URL**
http://hdl.handle.net/10069/6789

NAOSITE: Nagasaki University’s Academic Output SITE
http://naosite.lb.nagasaki-u.ac.jp
The Role of Relationship Banking on the Performance of Japanese Firms: An Empirical Study on Small and Medium Enterprises

Shigeru UCHIDA and Sarwar Uddin AHMED

Abstract:

Relationship banking indicating a long-term relationship between a bank and corporate firms attracted a lot of attention lately. There are various studies both theoretical and empirical, regarding the role of such relationship on the profitability of firms. But their conclusion is somewhat mixed. On this background, this paper aimed at drawing empirical evidence to test the impact of relationship banking by taking the time series balance sheet data of small and medium enterprises (SMEs) in Japan. As method of the study, we tried to construct a hypothetical model to test the relationship by including relevant influencing variables. The results of the research indicated that, although relationship banking leading towards corporate shareholding raises profitability of SMEs, increased supply of credit conversely reduces the profits. But overall, relationship banking has positive impact on the profitability of SMEs as there are other reasons to explain the negative relationship between credit and profitability.

Keywords: relationship banking, corporate performance, best sub-set analysis, small and medium enterprises

1. Introduction

Relationship banking gradually developed into a field of higher significance for corporate firms, particularly for small and medium enterprises (SMEs). Because for large firms with good reputation and credit worthiness, establishing relationship with particular bank or banks does not count much as they can raise funds comparatively easily. But for SMEs, relationship banking becomes vital, as unless their credit worthiness is known to the lender for a considerable period of time, it would be very difficult for them to get credit on a speedy
basis and be rescued during financial distress. A long-term relationship allows the lending bank to gather adequate information regarding the future prospect and credit worthiness of the borrowing firm and to decide whether to extend credit, how to price it and the extent of collateral. However, in lieu of this an obvious question arises: are these relationships banking really helping the SMEs to improve their performance?

Table 1 Empirical Evidence on Relationship Banking

<table>
<thead>
<tr>
<th>Main Features of Relationship Banking</th>
<th>Overall Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased credit availability</td>
<td>O</td>
</tr>
<tr>
<td>Lower investment sensitivity to liquidity</td>
<td>O/Δ</td>
</tr>
<tr>
<td>Less risk of client firms</td>
<td>O/Δ</td>
</tr>
<tr>
<td>Risk sharing through interest rates</td>
<td>Δ/O</td>
</tr>
<tr>
<td>Effective handling of financial distress: timely management intervention</td>
<td>O/Δ</td>
</tr>
<tr>
<td>Firms faring worse in economy-wide financial turbulence (when banks themselves are in distress)</td>
<td>Δ/O</td>
</tr>
<tr>
<td>Monopoly rents charged on client firms</td>
<td>Δ</td>
</tr>
<tr>
<td>Faster corporate growth</td>
<td>X/Δ</td>
</tr>
<tr>
<td>Higher corporate efficiency and profits</td>
<td>X/Δ</td>
</tr>
</tbody>
</table>

Note: O yes; O/Δ largely yes; Δ/O weakly yes; Δ mixed, X/Δ largely no
Source: Nam (2004)

There are numerous literatures concerning the impact of relationship banking on availability of credit, rescuing in financial distress, reducing risk and improving the performance of the borrowing firms (for example, Fukuda and Hirota, 1996; Nam, 2004; Hoshi, Kashyap and Scharfstein, 1990; Okazaki and Horiuchi, 1992). The findings of these studies are rather diversified. Some found positive impact in some of the above factors and some did not. Nam (2004) summarized a literature review of the empirical evidence on relationship banking features as shown in Table 1. According to this table, relationship banking did not contribute in raising corporate efficiency and profits. But the Small and Medium Enterprise Agency (2000) concluded that SMEs having close relationship with banks (with bank shareholding of the firm) tend to show higher profits (ROA), sales growth, presences in new business and so on. Based on these contrasting results of the role of relationship banking on the profitability of SMEs, this paper aims to investigate this role by conducting an empirical
2. Data and Method

2.1 Data

As for the data source we have used the financial data of exchange listed SMEs in Japan. SMEs are selected according to the definition provided in the Small and Medium Enterprises Basic Law¹, where the term "small and medium enterprise" (SME) refers to enterprises in Manufacturing and other industries with capital size not in excess of 300 million yen, or number of employees, 300 or fewer, Wholesale industries: 100 million yen or less, or 100 or fewer, and Retail industries and Services industries: 50 million yen or less, 100 or fewer, respectively. According to this definition we have picked up three-year time series balance sheet data (March 2002-March 2004) of 98 SMEs from Kaisha Shikiho, 2004 and conducted the analysis. During the final test the numbers of SMEs are again reduced due to non-availability of complete data regarding all the required factors.

2.2 Method

To test the relationship between the return on assets (ROAs) of SMEs with some other relevant factors we tried to construct a hypothetical multivariate model to determine the factors, which influences the performance of the firms (ROAs). The best-subset approach of model selection is used for identifying the most influencing variable (Levine et al., 2002). The steps followed in the model selection under this approach are outlined in Fig. 1. Accordingly, two criteria are used to choose among models with different combination of independent variables. The first criterion is variance inflationary factor (VIF), used for measuring collinearity among the explanatory variables. VIFₖ, the variance inflationary factor for variable j is defined in Equation 1.

\[
\text{VIF}_j = \frac{1}{1 - r_j^2} \quad (1)
\]

Where, \(r_j^2\) is the coefficient of multiple determination of explanatory variable \(X_j\) with all other \(X\) variables.²

A second criterion used for evaluating competing models is \(C_p\) statistic, developed by Mallows and is defined as shown in Equation 2³.

\[
C_p = \frac{(1-r_j^2)(n-T)}{1-r_j^2} - (n-2(k+1)) \quad (2)
\]

Where,
$K =$ number of independent variables included in a regression model
$T =$ total number of parameters (including the intercept) to be estimated in the full regression model
$r_k^2 =$ coefficient of multiple determination for a regression model that has $k$ independent variables
$r_T^2 =$ coefficient of multiple determination for a full regression model that contains all $T$ estimated parameters

As a selection standard the goal is to find models whose $C_p$ is close to or below $(k+1)$. Statistical software PH stat2 is used for the statistical analysis.

![Fig. 1 Step-wise procedure in model building by best-subsets approach](image)

3. Multivariate Analysis

3.1 The Hypothetical Model

A hypothetical multivariate model based on conceptual relationship is constructed to determine the factors, which influences the performance of the corporate firms (Profitability). The objective is to see how relationship banking is affecting the performance of corporate firms. As a parameter to represent profitability we have selected time series mean of return on assets (ROAs) of the companies. The model consists of variables that are hypothetically assumed to have an influence on profitability of a corporate firm, such as: total assets, total capital employed, sales volume, debt-equity ratio, percentage of holding share by
banks and number of banks. Accordingly, total capital employed (TCA) and sales volume (SAL) are included to test the influence of capital and operating status on the profitability of the firms (PRF). Next, debt-equity ratio (DER) is adopted to test the impact of financial leverage. Financing cash flows (FCF), percentage of holding share by banks (SHA) and number of banks (NBK) are involved to check how the share and presence of banking institutions affect the profitability of the firms. Finally, return on equity (ROE) is introduced to see the relationship between equity return and assets. These factors, which are hypothesized to have influence on a firm’s profitability, can be summarized by the following conceptual model:

\[
\text{Profitability (ROAs)} = \mathcal{f}(\text{TCA, SAL, DER, SHA, NBK, FCF, ROE})
\]

The explanation of the variables and the descriptive statistics are presented in Table 2, containing their expected relationship sign with the dependent variable return on assets (ROA). The debt-equity ratio in the table is calculated as follows:

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Description</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Expected Sign in Regression Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>The dependent variable is the time series mean of return on assets</td>
<td>4.56</td>
<td>7.82</td>
<td></td>
</tr>
<tr>
<td>TCA</td>
<td>Total capital of the company in million yen</td>
<td>215.09</td>
<td>62.01</td>
<td>+</td>
</tr>
<tr>
<td>SAL</td>
<td>Time series mean of the total sales volume of the company in million yen</td>
<td>4447.28</td>
<td>3652.83</td>
<td>+</td>
</tr>
<tr>
<td>DER</td>
<td>Debt-equity ratio of the company</td>
<td>1.04</td>
<td>1.93</td>
<td>?</td>
</tr>
<tr>
<td>SHA</td>
<td>Percentage of share held by financial institutions</td>
<td>2.21</td>
<td>3.29</td>
<td>?</td>
</tr>
<tr>
<td>NBK</td>
<td>Number of banks the company maintains trading relationship</td>
<td>3.75</td>
<td>1.95</td>
<td>?</td>
</tr>
<tr>
<td>FCF</td>
<td>Time series mean of financing cash flows in 100 million yen</td>
<td>-5.57</td>
<td>134.97</td>
<td>?</td>
</tr>
<tr>
<td>ROE</td>
<td>Time series mean of return on equity</td>
<td>11.78</td>
<td>21.51</td>
<td>+</td>
</tr>
</tbody>
</table>
Debt-equity Ratio (DER) = \frac{\text{Total Fixed Liabilities}}{\text{Total Share Holder's Equity}}

Where, fixed liabilities include loan from banks. A higher debt-equity ratio implies the dominance of bank loans as a source of financing.

Table 3  Selected models by best-subsets analysis for reducing the number of explanatory variables

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Variables in the Model</th>
<th>Cp</th>
<th>k</th>
<th>R</th>
<th>Adj. R</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NBK, FCF, SHA, DER, SAL, ROE</td>
<td>6.00</td>
<td>7</td>
<td>0.78</td>
<td>0.76</td>
<td>3.86</td>
</tr>
<tr>
<td>2</td>
<td>NBK, SHA, DER, SAL, ROE</td>
<td>5.79</td>
<td>6</td>
<td>0.77</td>
<td>0.76</td>
<td>3.88</td>
</tr>
<tr>
<td>3</td>
<td>FCF, SHA, DER, TCA, SAL, ROE</td>
<td>6.00</td>
<td>7</td>
<td>0.78</td>
<td>0.76</td>
<td>3.86</td>
</tr>
<tr>
<td>4</td>
<td>FCF, SHA, DER, SAL, ROE</td>
<td>4.00</td>
<td>6</td>
<td>0.78</td>
<td>0.76</td>
<td>3.83</td>
</tr>
<tr>
<td>5</td>
<td>SHA, DER, TCA, SAL, ROE</td>
<td>5.81</td>
<td>6</td>
<td>0.77</td>
<td>0.76</td>
<td>3.88</td>
</tr>
<tr>
<td>6</td>
<td>SHA, DER, SAL, ROE</td>
<td>3.83</td>
<td>5</td>
<td>0.77</td>
<td>0.76</td>
<td>3.86</td>
</tr>
</tbody>
</table>

Table 4  Results of the regression analysis by using best-subsets approach to model building (Dependent Variable = ROA)

| Variables | Coefficient (t-stat) [
\[n=79\] |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.8242(3.72)</td>
</tr>
<tr>
<td>SAL</td>
<td>-0.0003(-2.8086)*</td>
</tr>
<tr>
<td>DER</td>
<td>-1.1697(-5.0142)*</td>
</tr>
<tr>
<td>SHA</td>
<td>0.3591(2.6128)*</td>
</tr>
<tr>
<td>ROE</td>
<td>0.3144(15.2852)*</td>
</tr>
</tbody>
</table>

Note: * Indicates that the coefficient is statistically significant at 0.05 level.

3.2 Model Selection

Accordingly, best-subsets analysis was conducted by including the variables mentioned in equation 3. The results are summarized in Tables 2-4. All the variables mentioned above have VIF < 2, thus no fear of collinearity exists.

As shown in Table 3, due to the subset analysis, out of 126 models we have found
6 models having $C_p$ statistic < $(k + 1)$ and almost similar adjusted R Square and standard error. Only the best models are shown here. Finally, on the basis of the significance of the regression coefficients (P value) and lowest $C_p$ statistic, model 6 is selected as the best model.

3.3 Model Results

Thus from the selected model we have found that only SAL, DER, SHA and ROE variables are worth of retaining in the model and are statistically significant. Where SAL and DER are negatively related, on the other hand SHA and ROE are positively related with the dependent variable ROA (see Table 4). Accordingly our fitted regression model stands as follows:

$$PRF \ (ROA) = 2.8242 - 0.0003SAL - 1.1697DER + 0.3591SHA + 0.3144ROE \cdots (4)$$

4. Concluding Remarks

As a continuation to our previous literature survey, this study was undertaken to empirically examine the impact of relationship banking on the performance of the Japanese corporate firms, particularly the exchange listed small- and medium-sized enterprises. The findings of the study can be summed up as follows:

1) Percentage of shareholding by banks showed positive relationship with ROA indicating that, relationship banking does count in improving the profitability, management performance of the firms.

2) Whereas, the negative relationship between debt-equity ratio with profitability (ROA), indicates that, firms having higher financial leverage (loan capital) are prone to be a losing concern in terms of profitability. Thus firms, which are taking bank loans more, are having comparatively more financial difficulties. Conversely, firms relying on equity capital more are comparatively more profitable.

Thus the mixed impact of relationship banking on profitability of SMEs can be expressed through Fig. 2. Corporate shareholding seemed to raise profitability through more integrated monitoring and resulted into better corporate governance. On the other hand, increase in credit showed negative relationship with profits. One explanation for this might be that, usually the losing concerns are borrowing more and relying on debt capital than equity. However, more detailed studies also paying attention to the business trend are needed to establish and support these lines of findings.
Fig. 2 Empirical results of the role of relationship banking on SMEs profitability

Notes

† Professor, Faculty of Economics, Nagasaki University.
‡ Research Associate, Faculty of Engineering, Nagasaki University.
1) The amendment of the Small and Medium Enterprises Basic Law in 1999.
2) As a rule of thumb all VIF should be less than 5.0 to prove that there is no collinearity among the explanatory variables. See Levine et al. (2002), Gotoh et al. (2003) for instance.
3) See Neter et al. (1996) for details.

References

The Small and Medium Enterprise Agency (2000) White paper on small and medium enterprises for FY 1999 – Towards the age of management innovation and new business creation –, Printing Bureau,
The Role of Relationship Banking on the Performance of Japanese Firms: An Empirical Study on Small and Medium Enterprises

Ministry of Finance.


URL: The Small and Medium Enterprise Agency, available at:

http://www.chusho.meti.go.jp/sme_english/outline/02/01.html