Analysis of required and matching loan qualities in financial institutions∗

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Abstract

This study attempts to design required and matching loan quality models with three different factors for assessing credit risk. The models include three participants: the depositor assessing the financial institution, the financial institution pricing a financing project, and the investment agency assessing the financial goods provided as security on loans when the financial institution securitizes certain assets. This investigation subsequently considers the matching loan qualities in extended models, which are the compromises between the financial institution and the depositor or investment agency when their required loan qualities match the same criteria.

Keywords : Loan quality, financial institution, securitization, credit risk.

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1. Introduction

Financial institutions, acting as intermediaries, assume risks and promote efficient resource allocation by employing financial leverage. However, when borrower loan quality decreases, financial institutions will suffer losses. It is generally too late for financial institutions to adjust the credit risk premium fixed in the original contract. Consequently, financial institutions are constantly exposed to the risk of borrower default, which is the major risk they confront in their lending decisions.

Berger and DeYoung [2] tested four hypotheses regarding the relationships among loan quality, cost efficiency, and bank capital. The results indicate that increases in non-performing loans generally reduce measured cost efficiency, reduction in measured cost efficiency increases problem loans, and non-performing loans are increased by reduced bank capital ratios. Altman and Suggitt [1] examined annual and cumulative default rates on large, rated, and syndicated commercial loans. Their findings indicate that mortality rates on bank loans resembles those on corporate bonds when measured cumulatively over the five-year period after issuance, while loan default rates are significantly higher than bond default rates during the first two years following issuance. Dietsch and Petey [4] presented an internal credit risk model for French SME (small and medium sized enterprise) loans, which calculated the Value-at-Risk of any large portfolio of small commercial loans and derived the allocation of capital and loan pricing schemes. The model results demonstrate that the capital requirements derived from this model are significantly lower than those derived from the standard capital ratio due to the special nature of the samples examined. Notably, capital requirements tend to increase with the consideration of longer time periods, longer horizons, and smaller loan portfolios. To fund particular types of credit, loan sales and securitized loan pools are important bases for asset-backed lending. Rather than funding loans with deposit liabilities, Carlstrom and Samolyk [3] developed a market-based model of bank asset sales that identifies capital-constrained banks facing high loan demand, which are likely to sell loans to support the increased default risk.

Asset securitization\(^1\) was introduced in the United States with the structured financing of mortgage pools in the 1970s. Asset securitization

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\(^1\)Asset securitization is a recent innovation in which principal and interest payments are rebundled and sold as new securities.
was developed as an investment vehicle that isolated defined mortgage pools, segmented credit risk, and structured cash flows from underlying loans. Since the mid 1980s, asset securitization has spread to almost all asset types, making it one of the fastest growing activities in capital markets. Zandi [11] identified ongoing and long-lasting benefits derived from securitization due to globalization and the deregulation of the U.S. economy. In the area of securitization, Asia provides a contrasting example to the U.S. When the U.S. has one of the lowest savings rates in the world, Asia has been characterized by the squandering of high savings on unproductive investments. According to Ikeya [8], securitization has grown slowly in Asia (excluding Japan) due to the recent economic sluggishness and the ample liquidity in the region, which have combined to reduce the demand for securitization funding. However, the problems of non-performing loans and the credit crunch in the banking system may boost the growth of securitization as an effective method for developing the debt market. Securitization thus is deemed useful to financial institutions in solving the problem of non-performing loans and strengthening their capital structure. Francis and Stow [6] outlined the strategic and shareholder value benefits of securitization and argued that most companies should seriously consider securitizing their entire businesses.

Lockwood et al. [10] investigated changes in the wealth of firms that securitize their assets, and found wealth increases for industrial and automobile companies but decreases for banks. Interestingly, while strong banks experienced wealth gains after announcing asset securitization, weak banks experienced wealth loses. Consequently, Lockwood et al. [10] contended that financial institutions should enhance their capital structure before securitization. To increase their financial soundness, banks thus attempt to ensure lending conformation within risk-based capital (RBC) ratios. However, Jones [9] argued that securitization provides unprecedented opportunities for banks to reduce significantly their regulatory capital requirements with minimal corresponding reduction in their overall risks. This process is termed “regulatory capital arbitrage“ (RCA) and reduces effective risk-based capital requirements. These activities involve purely “cosmetic“ adjustments, which do little to enhance underlying safety and soundness and may not truly enhance the capacity of banks to absorb future unexpected loses. Securitization thus also creates difficulties for financial sector regulators. Furthermore, regarding the relationships
between securitization and mortgage rates, Heuson et al. [7] created a
model of the interactions among borrowers, originators, and a securitizer
in the primary and secondary mortgage markets, and demonstrated
that securitization does not reduce mortgage rates. However, reduced
mortgage rates can promote the growth of securitization.

Following Taiwan’s admission to the World Trade Origination
(WTO), domestic financial institutions encountered not only intense pres-
sure from foreign competitors, but also significant challenges in dealing
with the troublesome and long-standing problem of non-performing
loans. Furthermore, loan losses related to the recent recession induced
capital shrinkage in financial institutions, pushing leverage still higher.
Financial institutions with poor loan quality tend to be overly conservative
in new loan decisions, thus depressing profits. Consequently, methods
for assessing loan quality are essential to boost the competitiveness of
financial institutions.

To enhance the maturity of the Taiwanese financial market and
infrastructure, several regulations including the legal system have been
implemented recently, and most notably is the passage of the Taiwan Fi-
nancial Securitization Law on June 1, 2002. Although financial institutions
constantly confront problem loans, asset securitization seems to allow
financial institutions to enhance liquidity, generate fee-based income, and
optimize capital utilization. Accordingly, clarifying the ability of asset
securitization to control the problem of non-performing loans effectively
is essential.

This paper is organized as follows: Section 2 presents the proposed
models, including the required and matching loan qualities. Section 3
then examines the sensitivity of loan quality to various factors. Section 4
uses real-world data from selected financial reports to apply the proposed
models. Finally, Section 5 presents conclusions.

2. Proposed model

The main revenue of financial institutions comes from interest spread.
Financial institutions apply deposits to leverage on loans, and thus often
face problems related to non-performing loans and credit risk. Assume
that an entrepreneur/borrower has a new project requiring financing.
Lending decisions in such a case will be based on the decisions of a
manager who represents the interests of the shareholders in a particular
financial institution. Moreover, depositors focus on interest revenue and investors stress on investment return. Depositors assess financial institutions to ensure the safety of their savings, and investment agencies assess candidates for securitization, with the latter being bound by the default risk of the relevant lending project. Consequently, shareholders of financial institutions utilize deposits to maximize net profits from loans, while securities investors (investment agencies) assess their equities to maximize the returns from financial securitization. Consequently, loan quality criteria derived from the required loan quality models differ depending on the perspectives of shareholders, investment agencies, and depositors. The relationship among the respective loan quality requirement of the financial institution, investment agency, and depositor is shown as Figure 1.

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**Figure 1**

Loan quality requirements of the financial institution, investment agency and depositor
Notably, the model proposed here assumes the existence of just one financial institution, investment agency, depositor, and borrower respectively, and considers a single maturity period. The proposed model involves the following assumptions and notations:

\( D \) : volume of the deposits of the depositor in the financial institution.
\( E \) : shareholder equity in the financial institution.
\( \alpha \) : reserved capital ratio of the financial institution.
\( \alpha \) : reserved capital ratio required by government regulations (constraint condition is satisfied by \( \alpha \geq \alpha \)).
\( R_I \) : fixed loan interest rate per period.
\( R_D \) : fixed deposit interest rate per period.
\( R_E \) : shareholder expected rate of return per period.
\( R_S \) : investor (here denoting the investment agency) expected rate of return for financial asset securitization investment per period.
\( P_I \) : probability of the financial institution recovering the loan without any problems.
\( P_S \) : probability of the investment agency being able to retrieve the capital invested by the financial institution for financial asset securitization.
\( P_D \) : probability that the depositor will have his/her principal and interest returned to him/her.

Accordingly, the notation is simplified as \( P_j \): probability that the borrower does not default, \( j = I, S, D \). \( P_j \in (0, 1) \). Furthermore, the required loan quality is assessed as the loan support level for borrowers with specific default risk. The decision variables in the proposed model are as follows:

\( P_I^* \) : loan quality required by the financial institution, \( P_I^* \in (0, 1) \),
\( P_S^* \) : loan quality required by the investment agency, \( P_S^* \in (0, 1) \),
\( P_D^* \) : loan quality required by the depositor, \( P_D^* \in (0, 1) \).

2.1 Model for loan quality required by the financial institution

The first consideration in this study is how the financial institution represents the interests of the shareholders in determining loan quality requirements. Total capitalization of the financial institution comprises deposits, \( D \), and owner equity, \( E \). The financial institution reserves \( \alpha \% \) of owner equity to meet minimum asset backing requirements for loans of \( \alpha \% \). Consequently, loans total \( D + E(1 - \alpha) \). Furthermore, the loan
interest rate $R_I$ exceeds the deposit rate $R_D$ (i.e. $R_I \geq R_D$). Notably, the success of the investment project of the borrower has a probability $P_I$, and this probability also represents the likelihood of the borrower not defaulting, namely that the financial institution successfully recovering the entire loan. Financing a loan generates returns of principal and interest following the investment period, namely $[D + E(1 - \alpha)](1 + R_I)$, at the cost of paying principal and interest on the deposit $D(1 + R_D)$ plus the opportunity cost of tying up the equity for the period of the loan $E(1 + R_E)$. Consequently, shareholders of the financial institution produce a net profit of $[D + E(1 - \alpha)](1 + R_I) - [D(1 + R_D) + E(1 + R_E)]$ after load period. Assume that the financial institution provides all the capitalization to the only borrower when the expected net profit is non-negative. However, if the investment project of the borrower has a probability $1 - P_I$ of failure and consequent borrower default, the financial institution will suffer net losses of $-E(1 + R_E)$ after one period of maturity due to limited equity liability.

In sum, the investment project of the borrower has probability $P_I$ of succeeding and probability $1 - P_I$ of failing. That is, the financial institution has probability $P_I$ of making a profit $D(R_I - R_D) + E(R_I - R_E) - \alpha E(1 + R_I)$, and probability $1 - P_I$ of making a loss $-E(1 + R_E)$. The expected net profit of the financial institution thus can be expressed as:

\[
P_I[D(R_I - R_D) + E(R_I - R_E) - \alpha E(1 + R_I)] + (1 - P_I)[-E(1 + R_E)] \geq 0.
\] (1)

After some manipulation, the required loan quality of the financial institution is:

\[
P^*_I = \frac{E(1 + R_E)}{D(R_I - R_D) + E(1 - \alpha)(1 + R_I)} > 0.
\] (2)

The condition $P^*_I \in (0, 1)$ must hold, and hence the following conditions should be satisfied: $\alpha < \frac{D(R_I - R_D) + E(R_I - R_E)}{E(1 + R_I)}$. Furthermore, the reserved capital ratio should meet banking regulations requiring at least $\alpha$% asset backing. Consequently, the reserved capital ratio for the financial institution should fit the pattern, $\alpha \leq \alpha < \frac{D(R_I - R_D) + E(R_I - R_E)}{E(1 + R_I)}$. 

2.2 Model for loan quality required by the investment agency

The investment agency assesses required loan quality fairly and objectively using the perspective of investors in financial asset securitization (FAS). Because of the bundling of loans with FAS, borrower default can cause losses for FAS investors (namely investment agencies). Consequently, the investment agency has a probability \( P_S \) of regaining invested capital when the investment project of the borrower has a probability \( P_S \) of success. Hence, the return of principal and interest \( (D + E(1 - \alpha))(1 + R_I) \) after one period of maturity is earned at the expense of the opportunity cost of investing elsewhere \( (D + E(1 - \alpha))(1 + R_S) \). Notably, the investment agency achieves a net profit of \( (D + E(1 - \alpha))(1 + R_I) - (D + E(1 - \alpha))(1 + R_S) \). The investment agency will back an FAS project only if the expected net profit of investors equals or exceeds zero. On the other hand, there is also a probability \( 1 - P_S \) of the investment project failing. In the event of failure, the investment agency loses the funds provided for the project and expected returns \( -(D + E(1 - \alpha))(1 + R_S) \) from the borrower. To summarize, the expected net profit of investors following one period of maturity is:

\[
P_S \left( (D + E(1 - \alpha))(1 + R_I) - (D + E(1 - \alpha))(1 + R_S) \right) + (1 - P_S) \left( -(D + E(1 - \alpha))(1 + R_S) \right) \geq 0. \tag{3}
\]

After some manipulation, the required loan quality of the investment agency \( P_S^* \) can be presented as:

\[
P_S^* = \frac{1 + R_S}{1 + R_I} > 0. \tag{4}
\]

The condition \( P_S^* \in (0,1) \) must hold; hence the condition \( R_I > R_S \) is satisfied.

2.3 Model for loan quality required by the depositor

The depositor decides whether to deposit funds in the financial institution depending on whether the actual loan quality meets his/her own criteria. If the investment project of the borrower has probability \( P_D \) of success, the depositor has probability \( P_D \) of being repaid the principal and earning interest \( DR_D \) after one maturity period. However, the depositor incurs a loss of \( -D(1 + R_D) \) but is repaid with reserved equity \( \alpha \in (1 + R_E) \) when the investment project of the borrower has the probability \( 1 - P_D \) of failing after one period of maturity. Consequently,
the depositor can only partially recover the principal and interest $\alpha E(1 + R_E) - D(1 + R_D)$ after one period of maturity. The expected net profit of the depositor for this loan is expressed as follows:

$$P_D(\alpha E(1 + R_E) - D(1 + R_D)) \geq 0.$$  \hfill (5)

Following some manipulation, the required loan quality of the depositor $P_D^*$ becomes:

$$P_D^* = \frac{D(1 + R_D) - \alpha E(1 + R_E)}{D(1 + 2R_D) - \alpha E(1 + R_E)}.$$  \hfill (6)

The condition for the required loan quality of the depositor $P_D^* \in (0, 1)$ should be always satisfied.

3. Matching loan quality model incorporating other considerations

The previous section discusses the models of required loan quality from various perspectives, including those of the financial institution, investment agency, and depositor respectively. The following debate surveys the perspectives incorporating other considerations, such as the loan quality required by the financial institution equal to that required by the depositor or investment agency. Models are presented to match the respective loan quality required by the financial institution with that by the depositor or investment agency, which are defined as matching loan qualities in this study. The objective of this study is to improve the risk control by financial institutions, achieved by higher loan quality requirement of depositors or investment agencies. The following section considers matching loan qualities.

3.1 Matching loan quality requirements of the financial institution and the depositor

In general, the depositor is more conservative and requires higher loan quality than the financial institution. To attract deposits, the financial institution raises loan quality requirements to a level acceptable to the depositor. To compromise with the financial institution, the depositor will loosen his/her loan quality criteria to match that of the financial institution, and vice versa.

Figure 2 shows the compromise between the two different criteria and presents the matching loan quality herein. Equivalence of expected
net profit is used to determine the level of loan quality acceptable to both the depositor and the financial institution. Equations (1) and (5) are used to equalize the expected net profit of the financial institution and the depositor,

\[ P_{I=D} [D(R_I - R_D) + E(R_I - R_E) - \alpha E(1 + R_I)] + (1 - P_{I=D})[-E(1 + R_E)] = P_{I=D} (1 - P_{I=D})[\alpha E(1 + R_E) - D(1 + R_D)] \]

and then the matching loan quality of the financial institution and the depositor is derived as:

\[ P_{I=S} = \frac{D(1 + R_D) - E(1 - \alpha)(1 + R_E)}{D(1 + 2R_D) - D(R_I - R_D) - \alpha E(1 + R_E) - E(1 - \alpha)(1 + R_I)}. \]  

(7)

3.2 Matching loan quality requirements of the financial institution and the investment agency

Normally, investors require higher loan quality than the financial institution for investment risk premium. To successfully securitize parts
of the financial assets, or to reduce the issue cost; however, the financial
institution tends to raise loan quality requirements to meet the criteria
of the investment agency. The matching loan quality is that which is
simultaneously accepted by both the investment agency and the financial
institution when they achieve equal requirement.

Matching loan quality

\[ \text{Compromise} \]

Financial institution \hspace{1cm} \text{Raise} \hspace{1cm} \text{Loosen}

Loan quality requirement \hspace{1cm} \text{Loan quality requirement}

\[ P^*_I \hspace{1cm} P^*_S \]

\[ \text{Spread} \]

Borrower

\[ \text{Return} \]

\[ \cdots \cdot \cdot \cdot \]: Respective loan quality required by the financial institution and rating
agency

\[ \rightarrow \]: Compromise between the two – Matching loan quality

**Figure 3**

Matching loan quality requirements of the financial institution
and the investment agency

Figure 3 indicates matching loan quality which shows the result of
compromise between the financial institution and the investment agency.
Equations (1) and (3) can equalize the expected net profit of the financial
institution and the investment agency as follows:

\[
P_I = S \left\{ \left[ D + E(1 - \alpha) \right](1 + R_I) - |D + E(1 - \alpha)|(1 + R_S) \right\}
\]

and thus the matching loan quality for the financial institution and
the investment agency is derived as:

\[ P_{I=S}^* = \frac{D(1 + R_S) - E(1 - \alpha)(1 + R_E) - E(1 + R_D)}{E(1 + R_D)} \]  

(8)

4. Sensitivity analysis

This section considers the variables that determine the required loan qualities, along with how they influence the individual decisions of the financial institution, investment agency, and depositor. Table 1 lists the details of the analysis.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Sensitivity analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D</td>
</tr>
<tr>
<td>( P_I^* )</td>
<td>-</td>
</tr>
<tr>
<td>( P_S^* )</td>
<td>...</td>
</tr>
<tr>
<td>( P_D^* )</td>
<td>+</td>
</tr>
<tr>
<td>( P_{I=D}^* )</td>
<td>(±)</td>
</tr>
<tr>
<td>( P_{I=S}^* )</td>
<td>+</td>
</tr>
</tbody>
</table>

(+): monotonically increasing; (-): monotonically decreasing; (±): unclear

The following section discusses how the required and matching loan qualities vary in response to changes in certain factors:

(1) Effect of \( D \)

For a financial institution, required loan quality \( P_I^* \) is inversely related to deposits \( D \). The financial institution uses deposits to maximize shareholder returns. Therefore, the required loan quality \( P_I^* \) declines, while the pressure on the financial institution to issue loans increases with increasing deposits \( D \). Moreover, the high risk of leverage requires the financial institution to loosen required loan quality \( P_I^* \), and vice versa.

As for the depositor, given constant equity, the proportion of reserved equity \( \alpha E \) that can be used to cover the loss of depositors decreases with increasing deposits \( D \). Consequently, the depositor demands higher loan quality criteria \( P_D^* \) to protect against the possibility of future losses. A positive correlation exists between deposit size and depositor required loan quality.
Investment agency required loan quality $P_{IS}^*$ is not directly connected to deposits $D$, unless the loan quality criteria of the financial institution and investment agency are identical. Increasing deposits $D$ drives the financial institution to increase financing and thus reduce the loan quality requirements of the financial institution $P_{II}^*$. Furthermore, applying a greater proportion of deposits to provide financing increases the leverage of the financial institution; hence, the investment agency must increase required loan quality $P_{IS}^*$ to guarantee the capital invested. Notably, when the expected net profit of the financial institution matches that of the investment agency, the influence of the latter outweighs that of the former. Simultaneously, matching loan quality $P_{II}^* = S$ and deposits $D$ move together in the same direction.

(2) Effect of $E$

The loss incurred by the financial institution in the case of bankruptcy increases with owner equity $E$. To minimize the probability of this loss occurring, the financial institution increases required loan quality $P_{II}^*$. Consequently, the owner equity $E$ and required loan quality $P_{II}^*$ display an identical directional shift.

The loan quality required by the depositor $P_{ID}^*$ moves oppositely to owner equity $E$. The guarantee of principal and interest against bankruptcy increases with owner equity, $E$. Accordingly, the required loan quality $P_{ID}^*$ reduces, and vice versa.

Variation in owner equity $E$ does not directly influence the loan quality required by the investment agency for securitized assets $P_{IS}^*$. The matching loan quality $P_{II}^* = S$ only move oppositely to owner equity $E$ if the investment agency and financial institution make unilateral lending decisions when expecting equal net profit. Provided that the financial institution increases owner equity $E$ and thus reduces leverage, the investment agency can accept reduced loan quality $P_{II}^* = S$ and better protect investors against the loss of invested capital. Consequently, the matching loan quality $P_{II}^* = S$ is reduced.

(3) Effect of $R_I$

The loan quality required by the financial institution $P_{II}^*$ is inversely related to loan interest rate $R_I$. That is, the incentive of the financial institution to undertake the risk of reduced loan quality $P_{II}^*$ increases with loan interest rate and thus increases lending.

Provided that investors make a constant profit, increasing loan
interest rate $R_I$ motivates investors to undertake a fair risk. Reduced required loan quality of the investment agency $P^*_S$ is endured to increase investor revenue by increasing lending. Therefore, loan interest rate $R_I$ and required loan quality $P^*_S$ have an inverse relationship. No direct relation exists between required loan quality of the depositor $P^*_D$ and loan interest rate $R_I$.

(4) Effect of $R_E$

Once shareholders come to expect the higher rate of return $R_E$, the financial institution should be more cautious in lending, thus increasing the required loan quality $P^*_I$, and vice versa.

The financial institution becomes more conservative with increasing expected shareholder rate of return $R_E$. Moreover, the depositor feels reassured when the financial institution increases loan quality requirements in response to increased expected shareholder rate of return $R_E$. Accordingly, the depositor reduces the required loan quality $P^*_D$.

Furthermore, the required loan quality of the investment agency $P^*_S$ is not directly connected to expected shareholder rate of return $R_E$; nevertheless, when the financial institution and the investment agency agree upon common criteria, the increase in expected shareholder rate of return $R_E$ causes the financial institution to increase required loan quality $P^*_I$. Furthermore, the trust of the investment agency in the protection of invested capital by the financial institution increases, and thus the investment agency reduces required loan quality $P^*_S$. Since the degree of decrease for investment agency required loan quality $P^*_S$ is higher than that of increase for financial institution required loan quality $P^*_I$, the matching required loan quality $P^*_{I=S}$ and the expected shareholder rate of return $R_E$ move in different directions.

(5) Effect of $R_S$

Regarding expected investor rate of return $R_S$, the loan quality required by the investment agency to guarantee investor profit $P^*_S$ increases with the expected investor rate of return $R_S$ demanded by the investment agency, and vice versa.

The rate of return of the investment agency $R_S$ is not directly linked to the loan qualities required by the financial institution $P^*_I$ and the depositor $P^*_D$. However, if the financial institution and investment agency share identical views, the matching loan quality $P^*_{I=S}$ should improve because of the increase in the expected rate of return of investors $R_S$, balancing the desired profit and acceptable risk.
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(6) Effect of $R_D$

The capital cost of the financial institution increases with deposit interest rate $R_D$. Given a constant profit, the financial institution must increase required loan quality $P_I^*$ to reduce the probability of non-performing loans.

Furthermore, increased deposit interest rate $R_D$ provides an incentive for the depositor to earn more interest at the risk of accepting lower required loan quality $P_D^*$. Deposit interest rate $R_D$ does not directly influence the loan quality required by the investment agency $P_S^*$. However, deposit interest rate $R_D$ influences matching loan quality $P_I^{*=S}$ when the financial institution and investment agency have the same loan quality criteria. Raising deposit interest rate $R_D$ increases the capital and opportunity costs of investors, and thus also increases the required loan quality of the investment agency $P_S^*$. Consequently, deposit interest rate $R_D$ moves in the same direction as the matching loan quality $P_I^{*=S}$.

(7) Effect of $\alpha$

Increasing reserved capital ratio $\alpha$ requires the financial institution to prepare additional owner equity to cover its liabilities. To avoid capital waste, the financial institution increases required loan quality $P_I^*$ to prevent the possibility of increased loss of reserved capital.

Though reserved capital ratio $\alpha$ is not directly related to the loan quality required by investment agency $P_S^*$ and depositor $P_D^*$, the loan quality required by the financial institution $P_I^*$ increases with reserved capital ratio $\alpha$ as noted previously. However, the possibility of the financial institution suffering bankruptcy decreases with increasing reserved capital $\alpha E$, causing investors to reduce required loan quality $P_S^*$. To summarize, reserved capital ratio $\alpha$ and matching loan quality $P_I^{*=S}$ have an inverse relationship because the influence of the latter is stronger. Under certain circumstances, the correlation between the factors $(D, E, R_I, R_E, R_S, R_D, \alpha)$ and the required and matched loan qualities is uncertain as discussed in Appendix A.

5. Numerical analysis

The analysis uses the financial reports of certain Taiwanese listed companies\(^2\) in 2001. The loan quality required by the depositor exceeds

\(^2\)The Taiwan Economic Journal Data Bank of the financial reports is partially embellished. What we stress are the results of the analysis rather than the specific financial institution.
that required by the investment agency, and the loan quality required by 
the investment agency exceeds that required by the financial institution. 
Again, since the investors can reduce investment risk through portfolio 
diversification, loan quality is less important to them than to depositors. 
In contrast, since the depositor hopes to be able to safely retrieve all 
of his/her capital as well as receiving stable interest income, he/she 
wishes to maximize the owner equity of the financial institution and thus 
protect his/her deposits. On the other hand, the manager of the financial 
institution is inclined to relax loan quality requirements to maximize 
profits without securitization, while the investment agency strives to 
 improve the required loan quality because only high quality loans can 
act as collateral for securitization. Accordingly, we reach the conclusion 
\( P_D > P_S > P_I \).

The analytical results in Table 2 demonstrate that loan quality require-
ments that match the demands of all involved parties are situated between 
the two required loan qualities due to the compromise between the 
financial institution and the depositor or investment agency. Furthermore, 
the required loan qualities are rather high because the data are derived 
from the actual operating performance based on publicly available annual 
financial reports. The post-data, reflecting the poor performance of actual 
operation, contribute to higher loan quality requirements.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Numerical analysis</th>
<th>(Unit: million NT dollars)</th>
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<td>( P_I )</td>
<td>475766</td>
<td>475766</td>
</tr>
<tr>
<td>( P_S )</td>
<td>70000</td>
<td>70000</td>
</tr>
<tr>
<td>( P_D )</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>( P_{I=S} )</td>
<td>0.03</td>
<td>0.03</td>
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<tr>
<td>( P_{I=D} )</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>( P_j )</td>
<td>0.91</td>
<td>0.95</td>
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</table>

This work uses the factual shareholder and investor rate of return 
generated from the performance of the financial institution to estimate 
the expected rate of return for FAS investment. Again, this investigation 
derives higher required loan qualities by applying the post-data resulting 
from bad performance. Accordingly, if the financial institution has poor
performance or inappropriate capital structure, it may be unable to successfully securitize its financial assets or may face increased issuing cost. Consequently, rather than the argument that financial asset securitization can provide a solution to the problem of non-performing loans, this study finds that only financial institutions with superior performance or capital structures are capable of implementing financial asset securitization.

6. Conclusions

This study examines the required and matching loan qualities for the financial institution, investment agency, and depositor respectively. Different criteria are provided for each party when deciding whether to adopt loan financing. If actual loan quality exceeds required loan quality, the various parties involved will undoubtedly accept the loan; otherwise, they will reject it. Additionally, this discussion surveys the matching loan quality criteria obtained by the compromise between the financial institution and the depositor or investment agency in making lending decisions. Each case considers the unilateral perspectives of the two parties involved and derives the matching loan qualities identified by both parties. Matching loan qualities results from compromise, which provides both parties with common criteria for deciding whether to accept a loan. Once matching criteria are achieved, and then both parties will willingly accept the terms of the loan. Matching loan qualities provides the financial institution, the investment agency, and the depositor with a reference for assessing loan decisions. Generally, depositors have the highest loan quality requirements due to the desire to guarantee their deposits, while financial institutions have the loosest requirements due to their desire to extend more loans and thus increase profits. The investment agency requests a premium to prevent losses arising from default risk because investors assume higher risk for FAS products purchase. The loan quality requirements of the investment agency are higher than those of the financial institution but generally lower than those of the depositor. Furthermore, the loan quality requirements determined by the compromise among the parties involved fall between the requirements of the individual parties. If the financial institution has disorganized capital structure or is poorly operated, issuing costs may increase. That is, financial asset securitization does not necessarily solve the problem of non-performing loans. Instead, financial asset securitization benefits financial institutions with stable operations, giving them enhanced opportunities to apply financial asset securitization and thus improve the liquidity of their debt.
References


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