

國立交通大學

企業管理碩士學程

碩士論文



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中華民國九十九年六月

National Chiao Tung University

Global MBA

Thesis

Analysis of Competitive Advantage of
Banking Industry with Financial Indicators

The logo is a circular emblem with a gear-like outer border. Inside the circle, there is a stylized figure holding a scale of justice. Above the figure, the letters 'E', 'S', and 'A' are arranged in a row. Below the figure, the year '1896' is written in a banner.

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June, 2010

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ABSTRACT

The late 2000s financial crisis seriously damaged banking industry worldwide. Although many banks collapsed, were acquired under compulsion, or were restrained by government takeover, numerous banks survived and continued to provide financial services to customers. This paper intends to discover the resource configurations of strategic groups consisting of the banks surviving the global financial crisis and propose business strategies for them. By means of factor analysis, we extract five resource configurations from nine financial indicators as follows: customer relationship advantage, organization management ability, asset management ability, risk management ability, and liability management capacity. After that, we put cluster analysis into use to classify those banks into three strategic groups as given in the list below: default risk management reinforced cluster, profit oriented cluster, and conservative business cluster. Next, we discover that profit oriented cluster and default risk management reinforced cluster present remarkable financial performance arising from their distinguished competitive advantage.

Key word: Financial crisis, Banking industry, Resource configuration, Strategic group, Factor analysis, Cluster analysis, Competitive advantage

Acknowledgement

Time goes by quickly. It has been close to two years to study at National Chiao Tung University. Looking back on these days, I not only gained advanced knowledge of business administration but also broadened my global views by learning from professors and classmates. Although the people to whom I am grateful are many, I still want to express my thanks to some of them as below.

In the first place, many thanks to Professor Tang for such a fine logic training to guide me through the research procedure to the accomplishment of this paper. I also deeply appreciated Professor Kang's advice and Professor Liou's recommendation, which enabled this research to reach completeness. Secondly, I am grateful for Athena and Rachel for the reason that they kept me company and encouraged me when I felt frustrated during the period of thesis writing. Finally, I felt immense gratitude to my husband, my parents-in-law, and my parents. If lacking their full support, I could not focus my attention on studies for these two years without worry. Therefore, I hereby presented this paper to my favorite family and all of my friends to give my gratefulness to them.

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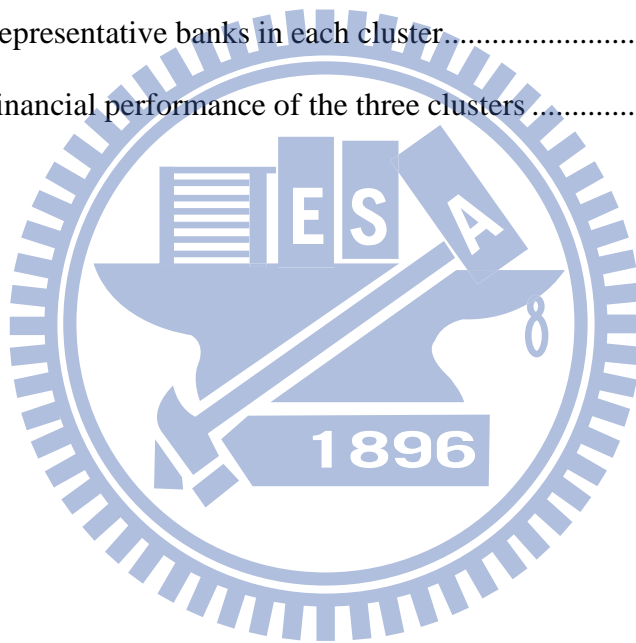
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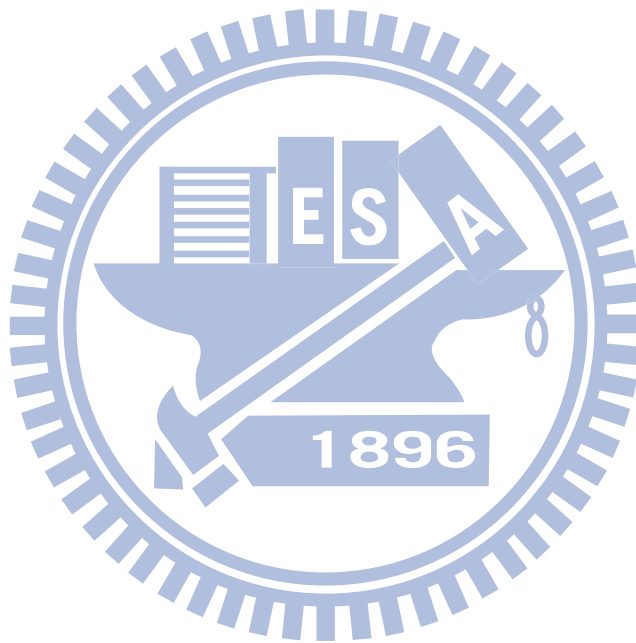
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I. Introduction

1.1 Research background

Beginning in the United States in December 2007, the financial crisis, which did not totally recover until now, has been called by three top economists, Nouriel Roubini, Kenneth Rogoff, and Nariman Behraves, the worst financial crisis since the Great Depression of the 1930s. It contributed to the failure of key businesses, declines in consumer wealth estimated in the trillions of U.S. dollars, substantial financial commitments incurred by governments, and a significant decline in economic activity.

The financial crisis has been linked to reckless and unsustainable lending practices resulting from the deregulation and securitization of real estate mortgages in the United States. The US mortgage-backed securities, which had risks that were hard to assess, were marketed around the world. A more broad based credit boom fed a global speculative bubble in real estate and equities, which served to reinforce the risky lending practices. The precarious financial situation was made more difficult by a sharp increase in oil and food prices. The emergence of Sub-prime loan losses in 2007 began the crisis and exposed other risky loans and over-inflated asset prices. With loan losses mounting and the fall of Lehman Brothers on September 15, 2008, a major panic broke out on the inter-bank loan market. As share and housing prices declined many large and well established investment and commercial banks in the United States and Europe suffered huge losses and even faced bankruptcy, resulting in massive public financial assistance.

At the start the companies affected were those directly involved in home construction and mortgage lending, such as Northern Rock and Countrywide Financial, as they could no longer gain financing through the credit markets. Over 100 mortgage lenders went bankrupt during 2007 and 2008. Concerns that investment bank Bear

Stearns would collapse in March 2008 resulted in its fire-sale to JP Morgan Chase. The crisis hit its peak in September and October 2008. Several major institutions failed, were acquired under duress, or were subject to government takeover. These included Lehman Brothers, Merrill Lynch, Fannie Mae, Freddie Mac, Washington Mutual, Wachovia, and AIG.

Moreover, because of financial asset securitization and fast international capital movements, well established investment banks designed and sold mortgage-backed securities and other complex toxic asset-backed structure notes to commercial banks not only in the United States and Europe but also in other regions around the world. These commercial banks desired to increase investment income and commission income by those complicated derivative instruments but did not realize the risks behind them. When the financial tsunami took place, commercial banks worldwide suffered massive losses.

The collapse of a housing bubble caused the values of securities tied to real estate pricing to plummet afterward, damaging financial institutions globally. Questions regarding bank solvency, declines in credit availability, and damaged investor confidence had an impact on global stock market, where securities suffered large losses during late 2008 and early 2009. Economies worldwide slowed during this period as credit tightened and international trade declined. Governments and central banks responded with unprecedented fiscal stimulus, monetary policy expansion, and institutional bailouts.

In addition, a global recession has resulted in a sharp drop in international trade, rising unemployment, and slumping commodity prices. Depressed economic activities further worsened the condition of the commercial banks, whose revenues mainly relied on net interest income, the difference between interest income received from borrowers

and interest expense paid to depositors. This was because commercial banks' clients were in default on payments of interest and/or principal. As a result, commercial banks suffered from increased non-performing loans, which led them to recognize more bad debt expense and reduced earnings. To sum up, the performance of commercial banks deteriorated due to slack economic activities.

1.2 Research motivation

The global financial crisis seriously damaged banking industry worldwide. Although many banks collapsed, were acquired under compulsion, or were restrained by government takeover, numerous banks survived and continued to provide financial services to customers. Therefore, an issue concerning whether, relative to the former, the latter possessed competitive advantage to continue to exist, keep on offering financial services to clients, and create superior performance is the motivation of this paper.

1.3 Research objective

This paper tries to find business strategies appropriate and offer suggestions for banking industry worldwide. The sample analyzed in this paper is composed of eighty-four commercial banks in the United States, the United Kingdom, Germany, France, and Japan.

All bank-specific data are taken from the Compustat database. We employ end-of-year data from 2004 to 2008 giving a total of five years. The research objective of this paper is to find the resource configurations of strategic groups formed with the banks which survived the global financial crisis and come up with business strategies for them.

1.4 Research framework

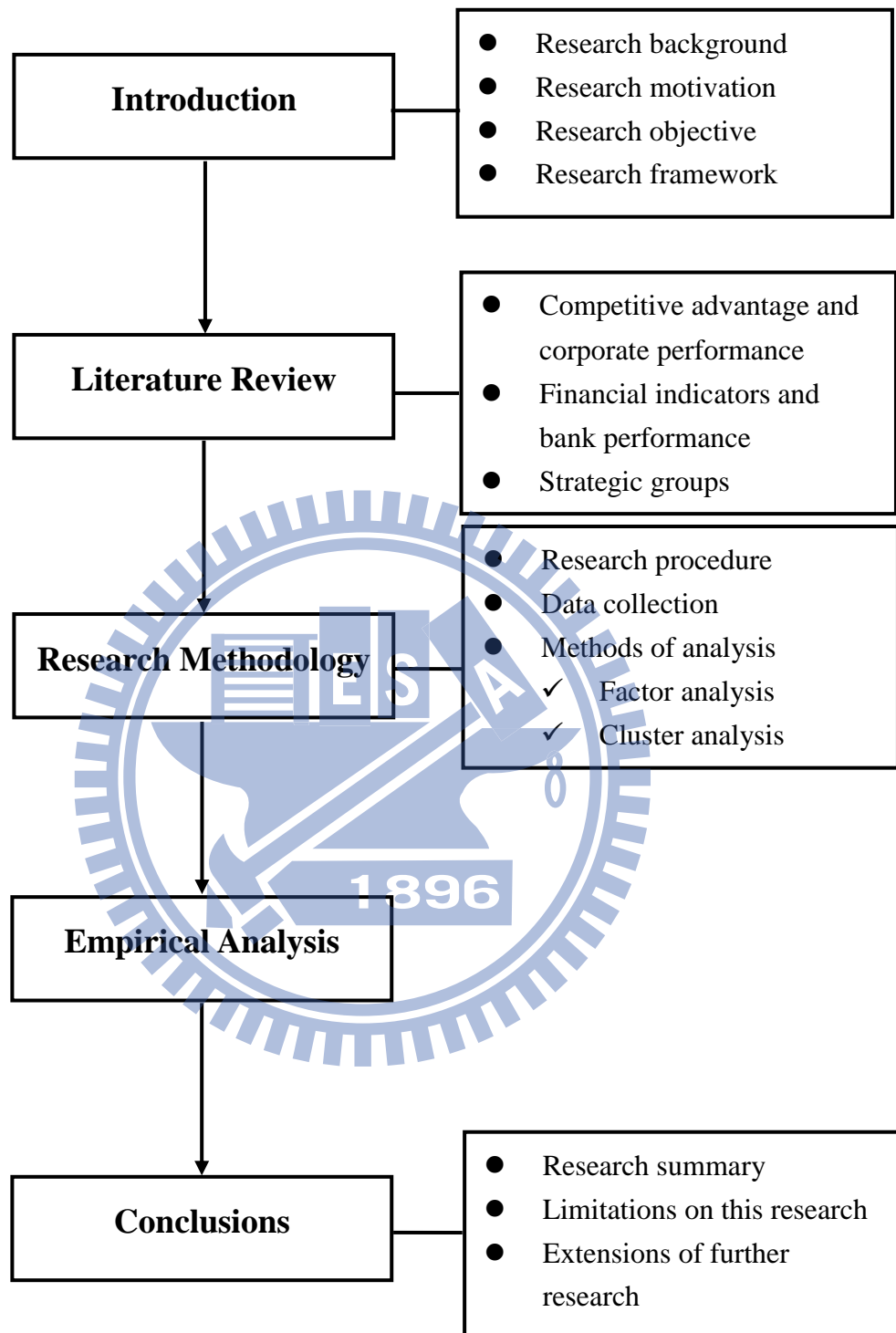


Figure I-1 Research framework

II. Literature Review

2.1 Competitive advantage and corporate performance

Competitive advantage occurs when an organization acquires or develops an attribute or combination of attributes that allows it to outperform its competitors. These attributes can include access to natural resources, such as high grade ores or inexpensive power, or access to highly trained and skilled personnel. New technologies, such as robotics and information technology, are included as a part of the product or assist in manufacturing it. Competitive advantage is the ability attained through attributes and resources to perform at a higher level than others in the same industry or market (Christensen and Fahey, 1984; Kay, 1994; Porter, 1980). “A firm is said to have competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential player” (Barney, 1991). Successfully implemented strategies will lift a firm to superior performance by facilitating the firm with competitive advantage to outperform current or potential players (Passemar and Calantone, 2000). To obtain competitive advantage, a business strategy of a firm manipulates the various resources over which it has direct control, and these resources have the ability to generate competitive advantage (Reed and Fillippi, 1990). Superior performance outcomes and superiority in production resources reflects competitive advantage (Day and Wesley, 1988).

To sum up, competitive advantage is signified as the ability to stay ahead of present or potential competition, and thus superior performance reached through competitive advantage will ensure market leadership. Also, it provides the understanding that resources held by a firm and the business strategy will have a profound impact on generating competitive advantage. In other words, competitive advantage is a key determinant of superior performance, and it will ensure survival and

prominent place in the market. Superior performance being the ultimate desired goal of a firm, competitive advantage becomes the foundation highlighting the significance to develop same.

Porter (1985) proposed that the fundamental basis of above-average performance in the long run is sustainable competitive advantage. Though a firm can have a myriad of strengths and weakness vis-à-vis its competitors, there are two basic types of competitive advantage a firm can possess: low cost or differentiation.

Although a competitive advantage has the ability to become sustained, this is not necessarily the case. A competing firm can enter the market with a resource that has the capability to invalidate the prior firm's competitive advantage, which results in reduced economic rents (Barney, 1986). A competitive advantage is sustainable when the efforts by competitors to render the competitive advantage redundant have ceased (Barney, 1991; Rumelt, 1984). When the imitative actions have come to an end without disrupting the firm's competitive advantage, the firm's strategy can be called sustainable. This is contrary to Porter's views that a competitive advantage is sustained when it provides above-average returns in the long run.

Powell (2001) disputed the resource-based view by proposing the counterfactual condition of competitive disadvantage. As noted by Powell (2001), "The two (competitive advantage and competitive disadvantage) are quite independent- if competitive advantage stems from in-imitable and idiosyncratic resources, competitive disadvantage is not merely the non-existence of such resources, but rather the failure to satisfy the minimum success requirements, or 'strategic industry factor' (Amit and Schoemaker, 1993), required by any firm." To say that a firm has competitive advantage is to say that it has certain resources which other firms do not have. One therefore expects the firm to exhibit above-average performance. However, there is no guarantee

that this must be so. The firm may fail to profit from its competitive advantage due to poor management or external obstacles. To address this issue, Powell suggested transforming the deterministic and unidirectional proposition that sustainable competitive advantage creates sustained superior performance into a probabilistic inference: sustainable competitive advantage is more probable in firms that have already achieved sustained superior performance.

Tang and Liou (2010) advanced Powell's idea by proposing that a firm's competitive advantage, resource configuration, and dynamic capability cannot be comprehended by outsiders. Its operational performance, nonetheless, can be captured by financial indicators. They promoted an inductive Bayesian interpretation of the sustainable competitive advantage proposition. From this viewpoint, the presence or absence of competitive advantage may be reflected in the causal relationship between resource configuration, dynamic capability, and observable financial performance.

2.2 Financial indicators and bank performance

Banking business has become more complex and potentially riskier because of innovation, deregulation and globalization in banking. Bank failures can disrupt the flow of credit to local communities (Gilbert and Kochin, 1989), interfere with the operation of the payment system (Dwyer and Gilbert, 1989), and reduce the money supply (Friedman and Schwartz, 1963). Bank failures also can have lingering effects on the real economy. Thus, bank supervisors use on-site examination and off-site surveillance to identify which banks are likely to fail. Supervisors then can take steps to reduce the likelihood that these banking institutions will fail. The most useful tool to identify problem banks is on-site examination, in which examiners travel to a bank and review all aspects of its safety and soundness. However, on-site examination is costly to supervisors because of its labor-intensive nature and burdensome to bankers because of

the intrusion into day-to-day operations. As a result, supervisors also monitor bank condition off-site. Off-site surveillance yields an ongoing picture of bank condition, enabling supervisors to allocate limited on-site examination resources efficiently (Gilbert, Meyer, and Vaughan, 1999).

In the United States, during an on-site bank exam, federal banking supervisors evaluate a bank's overall condition by assessing six components: Capital adequacy, Asset quality, Management, Earnings, Liquidity, and Sensitivity to market risk and then award a supervisory rating, commonly referred to as a CAMELS rating. Nevertheless, all exam materials are highly confidential, including the CAMELS. A bank's CAMELS rating is disclosed only to the bank's senior management and the appropriate supervisory staff (Lopez, 1999).

On the other hand, early warning systems are statistical models for off-site monitoring of bank condition employed by bank regulators to complement on-site examination (Thomson, 1991). These models seek to identify a bank's financial weakness at an early stage of the deterioration so as to warn interested parties of its potential failure through comparing the financial characteristics of financially troubled banks with those of financially sound banks (Barr, Seiford, and Siems, 1994). The output from these models help bank supervisors to determine which banking institutions need immediate and increased supervisory scrutiny, identify specific areas of concern, accelerate on-site examinations of banks showing financial deterioration, and allocate more experienced or more specialized examiners to banks with financial problems (Jagtiani, et al., 2003).

It is generally acknowledged that a bank's financial condition can be related to a fairly consistent set of financial variables. These variables mainly include measures of capital adequacy, asset quality, profitability, and liquidity. A large number of ratios

relating to these variables are used in various financial ratio and peer group analysis systems. To a large extent, the inputs for these systems are based on regulatory reporting data and annual accounts (Sahajwala and Bergh, 2000).

Besides, Sahajwala and Bergh (2000) noted that statistical models that aim to predict the failure or survival of a banking institution are grounded on the premise that banking institutions that fail or experience financial distress typically display similar behavior a few years prior to such an event. The behavior can be identified by an analysis of their financial condition.

Gunsel (2007) pointed out that most widely used bank-specific indicators are financial ratios that are designed to measure the six CAMELS components. The weakness of banks can be evident over time from a number of financial ratios that reflect capital inadequacy, poor asset quality, management inefficiency, lower income, higher liquidity risk, and more sensitive to market risk. A vast amount of literature empirically proved that each of the above components affects the probability of bank failure. Meyer and Pifer (1970), Sinkey (1975), Martin (1977), Avery and Hanweck (1984), Espahbodi (1991), Thomson (1991), and so on made use of financial and accounting information to draw variables that are proxies for CAMELS in a ratio analysis. Their studies demonstrate that financial and accounting information is an efficient way to show the characteristics of failed banks and non-failed banks. Similarly, more recent researches summarized in Table II-1 manifest that a number of financial ratios provide an appropriate basis to detect problem banks.

Nonetheless, Rojas-Suarez (2002) argued that the most commonly used financial indicators of bank performance in industrialized countries, CAMELS, perform poorly in emerging markets, such as Latin America. The two reasons are as follows: first, severe deficiencies in the accounting and regulatory framework greatly limit the meaning of

traditional financial indicators. Second, these indicators become less effective while liquid markets for bank shares, subordinated debt, and other bank assets and liabilities do not exist to validate the “real” worth of a bank as opposed to its accounting value.



Table II-1 Empirical studies of the identification of problem banks

Author (Year)	Objective	Variables
Thomson (1991)	Construct a failure prediction model for all sizes of banks	<p>(1)Capital adequacy Variable: $(\text{Book equity capital} + \text{The reserve for loan and lease losses} - \text{loans 90 days past due but still accruing} - \text{nonaccruing loans}) / \text{Total assets}$</p> <p>(2)Asset quality and portfolio risk Variables: $\text{Net chargeoffs} / \text{Total loans}$; Loan portfolio herfindahl index (constructed from the following loan classifications: real estate loans, loans to depository institutions, loans to individuals, commercial and industrial loans, foreign loans, and agricultural loans); $\text{Net loans and leases} / \text{Total assets}$</p> <p>(3)Management risk Variables: $\text{Overhead} / \text{Total assets}$; $\text{Loans to insiders} / \text{Total assets}$</p> <p>(4)Earnings Variable: $\text{Net income after taxes} / \text{Total assets}$ (i.e. Return on assets)</p> <p>(5)Liquidity risk Variable: $\text{Nondeposit liabilities} / \text{Cash and investment securities}$</p> <p>(6)Economic conditions Variables: Output herfindahl index (constructed using state-level gross domestic output by one-digit SIC codes); Unemployment rate in the county where the bank is headquartered; Percent change in state-level personal income; Dun and Bradstreet's state-level small business failure rate per 10,000 concerns</p> <p>(7)Others Variables: Size (Natural logarithm of total assets);</p>

		<p>AVGDEP (Natural logarithm of average deposits per banking office);</p> <p>BRANCHU (Dummy variable that is 1 if the state is a unit banking state, 0 otherwise);</p> <p>DBHC (Dummy variable that is 1 if the bank is in a bank holding company, 0 otherwise)</p>
Barr, Seiford, and Siems (1994)	Describe a bank failure forecast model developed around a new paradigm to assess a bank's management quality	<p>Equity capital/Total loans;</p> <p>Non-performing loans/Total assets;</p> <p>Data envelopment analysis (DEA) efficiency score;</p> <p>Net income/Total assets (i.e. Return on assets);</p> <p>Large deposits/Total assets;</p> <p>Construction</p>
Wheelock and Wilson (2000)	Examine the hazard of bank failures or acquisitions in the United States during the years 1984-1993	<p>(1)Capital adequacy Variable: Total equity/Total assets</p> <p>(2)Asset quality Variables: Total loans/Total assets; Real estate loans/Total loans; Other real estate owned/Total assets; Income earned, but not collected on loans/Total assets; Commercial and industrial loans/Total loans</p> <p>(3)Management Variables: Cost inefficiency; Input distance function measure of technical inefficiency; 1/Output distance function measure of technical inefficiency</p> <p>(4)Earnings Variable: Net income/Total assets (i.e. Return on assets)</p> <p>(5)Liquidity Variable: (Fed funds purchased-Fed funds sold)/Total assets</p> <p>(6)Miscellaneous factors</p>

		<p>Variables: Size (log of total assets);</p> <p>Hold (Dummy variable that is 1 if 25% or more of equity is held by a multi-bank holding company, 0 otherwise);</p> <p>BR1 (Dummy variable that is 1 if bank is located in a state allowing limited branching, 0 otherwise);</p> <p>BR2 (Dummy variable that is 1 if bank is located in a state allowing unlimited branching, 0 otherwise)</p>
Cole and Gunther (1998)	Develop a model to forecast the likelihood of bank failure	<p>(1)Capital adequacy</p> <p>Variable: Total equity capital</p> <p>(2)Asset quality</p> <p>Variables: Loans 90 days or more past due; Nonaccrual loans;</p> <p>Other real estate owned</p> <p>(3)Earnings</p> <p>Variable: Net income</p> <p>(4)Liquidity</p> <p>Variables: Investment securities;</p> <p>Large certificates of deposit (USD 100,000 or more)</p>
Gilbert, Meyer, and Vaughan (1999)	Compare the performance of supervisory screens and econometric models in the identification of banks likely to develop safety-and-soundness problems	<p>(1)Capital adequacy</p> <p>Variable: Total equity/Total assets</p> <p>(2)Asset quality</p> <p>Variables: (Loans 90 or more days past due or nonaccrual loans)/Total loans;</p> <p>Other real estate owned (real estate other than bank premises)/Total loans;</p> <p>Consumer loans/Total assets</p> <p>(3)Managerial competence</p> <p>Variables: Noninterest expense/Total revenues;</p> <p>Insider (officers and directors of the bank) loans/Total assets; Occupancy expense/Average assets</p> <p>(4)Earnings strength</p> <p>Variables: Net income/Total assets (i.e. Return on assets);</p> <p>Interest income accrued but not collected/Total loans</p>

		<p>(5)Liquidity risk Variables: Liquid assets (cash, securities, federal funds sold, and reverse repurchase agreements)/Total assets; Large denomination time deposits/Total assets; Core deposits (transactions, savings and small time deposits)/Total assets</p> <p>(6)Others Variables: Size (Natural logarithm of total assets); BHCRATIO (Each bank's total assets/The total assets of its holding company) Banks without holding companies have BHCRATIO=1</p>
Estrella, Park, and Peristiani (2000)	Evaluate the effectiveness of capital ratios in predicting bank failure	<p>(1)Risk-weighted capital ratio (Common stock+Common stock surplus+Retained earnings+Perpetual preferred stock)/Risk-weighted assets</p> <p>(2)Leverage ratio (Common stock+Common stock surplus+Retained earnings+Perpetual preferred stock)/Total tangible assets</p> <p>(3)Gross revenue ratio (Common stock+Common stock surplus+Retained earnings+Perpetual preferred stock)/Total interest and noninterest income before the deduction of any expenses</p>
Sahajwala and Bergh (2000)	Introduce the risk rank model of the US Federal Reserve's System to Estimate Examination Ratings (SEER) which estimates the probability that a bank will fail during the subsequent two	<p>(1)Asset quality Variables: Commercial and industrial loans; Loans past due (30-89 days); Loans past due (90 days plus); Non-accrual loans; Residential real estate loans; Other real estate owned; Asset size</p> <p>(2)Earnings Variable: Return on average assets</p> <p>(3)Liquidity Variables: Book value of securities; Time deposits greater than USD 100m</p> <p>(4)Capital Variable: Total net worth (equity capital)</p>

	years	
Bongini, Claessens, and Ferri (2001)	Study the determinants of distress and closure of East Asian financial institutions	(Equity+Loan loss reserve)/Gross loans; Loan loss reserve/(Equity+Loan loss reserve); Loan growth; Total operating expenses/Total revenues; Net income/Total average assets (i.e. Return on assets); Net interest income/Total revenues; Total loans/Total borrowings; Liquid assets/ Total assets; Size (log of assets); Private (Dummy variable that is 1 if financial institution is privately owned, 0 otherwise); Connected (Dummy variable that is 1 if financial institution is connected to industrial groups/ influential families, 0 otherwise); Foreign (Dummy variable that is 1 if financial institution is foreign owned, 0 otherwise); Nonbank (Dummy variable that is 1 if financial institution is a nonbank financial institution, 0 otherwise)
Bongini, Laeven, and Majnoni (2001)	Compare the performance of three sets of indicators of bank fragility for banks located in the East Asian crisis countries	(1)“Early warning” indicators based on balance sheet information Variables: Loan loss reserves to total equity; Net interest income to total income; Loan growth; Return on assets; Size; Foreign (Dummy variable that is 1 if financial institution is foreign owned, 0 otherwise); Connections (Dummy variable that is 1 if financial institution is connected to corporations/influential families, 0 otherwise); Nonbank (Dummy variable that is 1 if financial institution is a nonbank financial institution, 0 otherwise) (2)The implicit cost of deposit insurance premiums based on stock prices information Variables: Deposit insurance premiums;

		<p>Listed (Dummy variable that is 1 if financial institution is listed on the local stock exchange, 0 otherwise)</p> <p>(3)The historically observed default frequency associated to grades of rating agencies</p> <p>Variables: Moody's ratings;</p> <p>Rated (Dummy variable that is 1 if financial institution is rated, 0 otherwise)</p>
Gunsel (2007)	Provide a measure of the probability of bank failure in North Cyprus during the years 1984-2002	<p>(1)Capital adequacy</p> <p>Variables: Total capital/Total assets; Total loans/Total capital</p> <p>(2)Asset quality</p> <p>Variable: Total loans/Total assets</p> <p>(3)Management quality</p> <p>Variables: Operating expense/Total assets; Deposit interest expense/Total deposits</p> <p>(4)Earning</p> <p>Variables: Net income/Total assets (i.e. Return on assets); Net interest income/Total assets</p> <p>(5)Liquidity</p> <p>Variables: Liquid assets/Total assets; Liquid assets/Total deposits; Total deposits/Total loans</p> <p>(6)Asset size</p> <p>Variables: Total assets/Total banking sector assets; Logarithm of total assets</p>
Shen (2007)	Bring forward proxies for CAMEL	<p>(1)Capital adequacy</p> <p>Variable: (Tier 1 capital+Tier 2 capital)/Risk-weighted assets</p> <p>(2)Asset quality</p> <p>Variable: Non-performing loans/Total loans</p> <p>(3)Management</p> <p>Variable: Pretax income/The number of employees</p> <p>(4)Earnings</p> <p>Variables: Net income/Total assets (i.e. Return on assets);</p>

		<p>Net income/Stockholders' equity (i.e. Return on equity)</p> <p>(5)Liquidity</p> <p>Variable: Liquid assets/Total deposits</p>
Shen (2009)	Suggest important financial indicators while analyzing bank financial statements	<p>Net income/Total assets (i.e. Return on assets);</p> <p>Net income/Stockholders' equity (i.e. Return on equity);</p> <p>Net interest income/Earning assets (i.e. Net interest margin);</p> <p>Net interest income/(Net interest income+Noninterest income);</p> <p>Loan loss reserves/Non-performing loans (i.e. Coverage ratio);</p> <p>(Tier 1 capital+Tier 2 capital)/Risk-weighted assets</p>
Boyacioglu, Kara, and Baykan (2009)	Predict bank failure in Turkey during the years 1997-2003	<p>(1)Capital adequacy</p> <p>Variables: Shareholders' equity/Total assets;</p> <p>Shareholders' equity/Total loans;</p> <p>(Shareholders' equity+Net profit)/(Total assets+Off balance sheet commitments)</p> <p>(2)Asset quality</p> <p>Variables: Permanent assets/Total assets;</p> <p>Total loans/Total assets; Loans under follow-up/Total loans;</p> <p>Specific provision/Total loans;</p> <p>Specific provision/Loans under follow-up</p> <p>(3)Management</p> <p>Variable: Personnel expenses/Average assets</p> <p>(4)Earnings</p> <p>Variables: Net profit/Average assets;</p> <p>Net profit/Average shareholders' equity;</p> <p>Income before taxes/Average assets;</p> <p>Interest income/Total operating income;</p> <p>Non-interest expenses/Total operating income</p> <p>(5)Liquidity</p> <p>Variables: Liquid assets/Total assets;</p>

		Total loans/Total deposits (6)Sensitivity to market risk Variables: Trading securities/Total assets; Foreign exchange assets/Foreign exchange liabilities; Net interest income/Average assets; Net on balance sheet position/Total shareholders' equity
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2.3 Strategic groups

Hunt (1972) coined the term 'strategic group' in his study of the U.S. home appliance industry in the 1960s. He observed that asymmetry between firms within the white goods industry originated from the extent of vertical integration, the degree of product diversification, and the differences in product differentiation. This asymmetry resulted in four strategic groups: (1) full-line national manufacturers' brand producers, (2) part-line national manufacturers' brand producers, (3) private brand producers, and (4) national retailers. He believed that this taxonomy minimized economic asymmetry in each group and revealed barriers to entry to each strategic group.

Mobility barriers were structural factors that protected successful firms from invasions by adjacent competitors (Caves and Porter, 1977). They were intra-industry entry barriers which delineated boundaries between different strategic groups, and they may contrast with the external entry barriers discussed in traditional economic theory which deterred outside firms from entering any part of the industry (Harrigan, 1981).

Tang and Thomas (1992) induced that strategic groups was a concept that firms within an industry form groups depending on their strategies, and these strategic groups showed persistent performance differences. Contrary to traditional industrial organization paradigm, which postulated that structure determined conduct, which in turn determined performance (Bain, 1956; Caves, 1982), the concept of strategic groups argued that a firm's conduct (strategy) directly determined both the group structure and

the performance of the industry. The main prescriptions of this concept to managers were (1) that a firm needed to overcome mobility barriers in order to move to a better-performing group, and (2) that if a firm was already in a high-performing group, it should attempt to build mobility barriers to protect the profitability of its group. Accordingly, the concept of strategic groups seemed to constitute a useful tool both of analyzing an industry and of formulating strategies.

Harrigan (1985) believed that strategic group asymmetry referred to inter-group differences, and the distances between strategic groups were indicated in part by dissimilar mobility barrier heights. Asymmetries determined whether firms' strategic postures could be emulated easily. If their competitive advantage arose from attributes that rivals could imitate easily, strategic groups might be more vulnerable to copying by outsiders. For that reason, their mobility barriers would offer little protection. This concern became relevant within industries where competitive conduct changed frequently, where customer segments were converging, or where firms sought new ideas to serve existing customers.

Harrigan (1985) also thought that the height of each strategic group's mobility barriers would be determined by the types of competitive investments its firms have made in the past. Take retailing establishments as an example, the dimensions could include: the width of product line (Miller, 1981), relative merchandise prices (Miller and Springate, 1979), or relative cost positions. The height of mobility barriers could also be determined by firms' differences in brand identification, product quality, technological leadership, asset specificity (ease with which assets could be transformed into other uses), the extent of service provision, the degree of financial leverage, the differences between backward integration and forward integration (Harrigan, 1983), or other factors. Successful firms often preserved their competitive advantage by

developing steep mobility barriers. Accordingly, the analyses of the identities of strategic groups and of the nature of the mobility barriers which separated them could give important clues to profitability differences and other performance variations among these firms.



III. Research Methodology

3.1 Research procedure

We collect bank-specific data from the Compustat database, choose nine financial indicators, and employ factor analysis and cluster analysis to analyze the data. The research procedure is shown in Figure III-1.

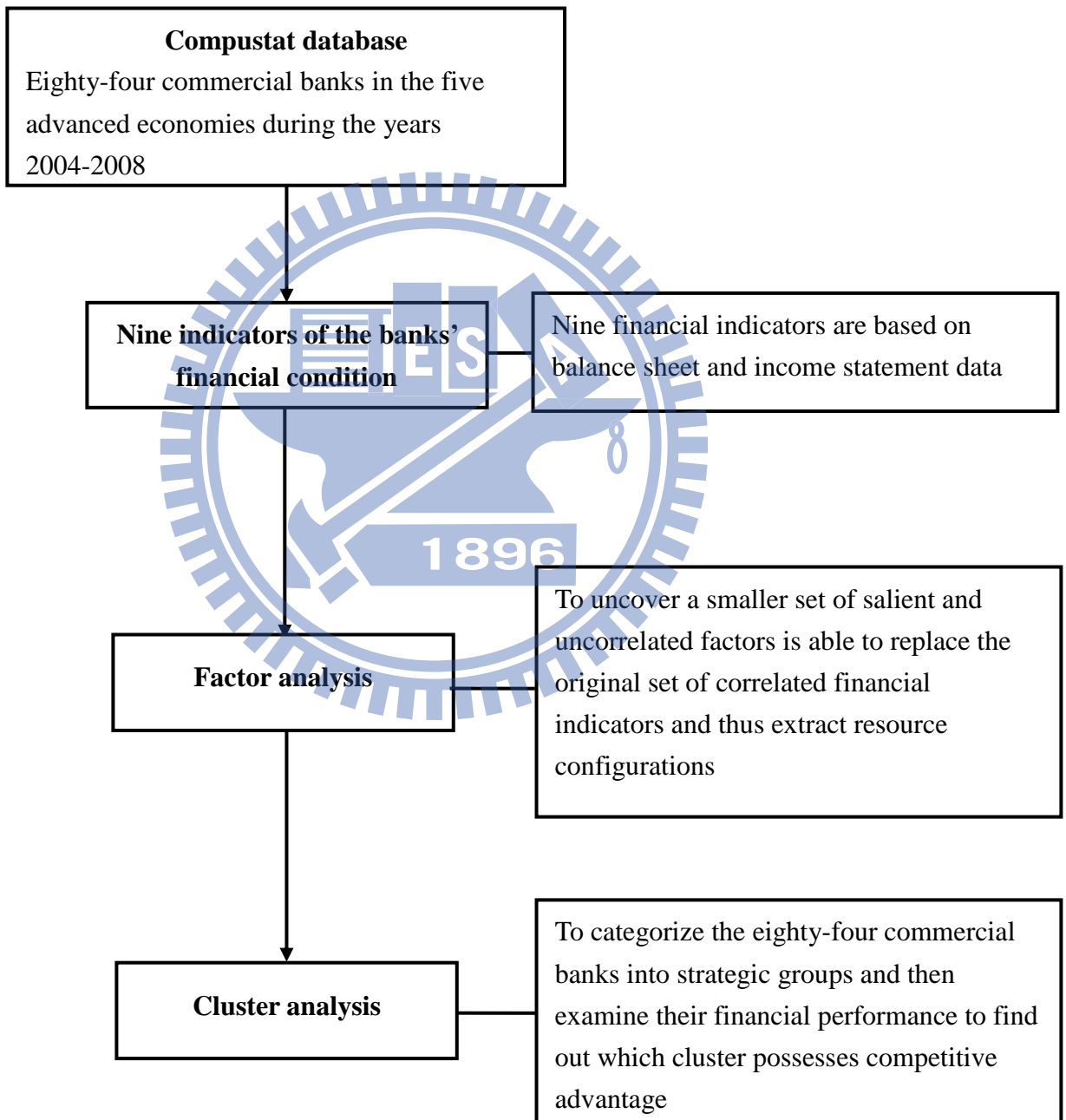


Figure III-1 Research procedure

3.2 Data collection

The sample analyzed in this paper consists of the eighty-four commercial banks whose SIC Code is 6020 in the five advanced economies during the period 2004-2008. The reasons are as below: first of all, the global financial crisis broke out at the end of 2007 and reached a critical stage in September 2008. Second, taking into consideration the usefulness of financial indicators, the degree of financial liberalization, and the extent of public disclosure of banks' financial positions, we collect data for commercial banks in the United States, the United Kingdom, Germany, France, and Japan.

All bank-specific data is year-end and is from the Compustat database. Banks are excluded if they failed, were acquired under duress, or were subject to government takeover in the late 2000s financial crisis. A bank is also excluded if its return on average assets is outlier by more than three standard deviations from the industry mean.

3.3 Methods of analysis

3.3.1 Factor analysis

Factor analysis is a statistical method exploited to describe the interdependences among a larger number of observed variables in terms of a smaller number of unobserved variables called factors. There are two types of factor analysis: exploratory factor analysis and confirmatory factor analysis. Exploratory factor analysis seeks to uncover the underlying structure of a relatively large set of observed variables without prior theory. Conversely, confirmatory factor analysis seeks to test and verify whether the number of factors and the loadings of measured variables on them are consistent with the expectation by pre-established theory.

This paper applies exploratory factor analysis to the financial data of the banks which survived in order to find out the resource configurations causing them

to continue to exist after the financial tsunami. Besides, a total of nine financial indicators are adopted in this step. On the strength of factor analysis, a smaller set of salient and uncorrelated factors is able to replace the original set of correlated financial indicators. What's more, those banks on the factor scores of the financial indicators are utilized in the following cluster analysis.

3.3.2 Cluster analysis

Cluster analysis is a statistical technique employed to assign a set of observations into subsets called clusters so that observations in the same cluster tend to be similar to each other and dissimilar to observations in the other clusters.

Cluster analysis is most frequently employed as a classification tool. It is also used by some researchers as a means of discovering and representing the structures in similarity data through the construction of dendrograms (Hartigan, 1967) or overlapping clusters (Shepard and Arabie, 1979). Whereas classification is concerned with the identification of discrete categories, structural representation is concerned with the development of a faithful representation of relationships (Punj and Stewart, 1983).

There are two types of clustering algorithms: hierarchical clustering algorithms and nonhierarchical clustering algorithms. Hierarchical algorithms find successive clusters by previously established clusters. These algorithms can be agglomerative or divisive. Four primary hierarchical clustering procedures are available: single linkage method, complete linkage method, average linkage method, and Ward's minimum variance method. In addition, two variants of the average method, centroid method and median method have very undesirable properties (Aldenderfer, 1977; Sokal and Sneath, 1973) which recommend against their use (Punj and Stewart, 1983). Of the hierarchical clustering procedures,

average linkage method and Ward's minimum variance method have been shown to perform better than the other procedures.

These are more varieties of the nonhierarchical methods, though all work on similar principles. These iterative partitioning methods begin by dividing observations into some predetermined number of clusters. Observations are then reassigned to clusters until some decision rule terminates the process. These methods may differ with respect to the starting partition, the type of reassignment process, the decision rule used to terminate clustering, and the frequency with which cluster centroids are updated during the reassignment process. These methods include K-means method, hill-climbing method, and combined K-means and hill-climbing method (Punj and Stewart, 1983).

Punj and Stewart (1983) drew a conclusion from the empirical findings on the performance of clustering algorithms: iterative partitioning methods are preferable to hierarchical methods. However, this holds only when a nonrandom starting point can be specified. Moreover, iterative partitioning methods require prior specification of the number of clusters desired. Hierarchical methods require no such specification. Thus, the users are confronted with the determination of both an initial starting point and the number of clusters in order to employ the methods that have demonstrated superior performance. Information about determining starting points in the form of a priori descriptions of expected clusters may be available. In the absence of such information, a means of obtaining starting points and an estimate of the number of clusters is required. A two-stage procedure may be employed to deal with this problem.

In the first place, one of the hierarchical methods which has demonstrated superior performance, average linkage method or Ward's minimum variance

method, may be adopted to obtain a first approximation of a solution. By examining the results of this preliminary analysis, one can determine both a candidate number of clusters and a starting point for the iterative partitioning analysis. Furthermore, this preliminary analysis can be used to examine the order of clustering of various observations and the distances between individual observations and clusters. This provides an opportunity for the identification of outliers which may be eliminated from further analyses. The remaining cases may then be submitted to an iterative partitioning analysis, such as K-means method, for the refinement of the clusters.

To make the results of this cluster analysis more ideal, this paper applies two-stage clustering to the financial data of the banks which survived the financial tsunami. The nine financial indicators are also adopted in this step. To begin with, we make use of Ward's minimum variance method to obtain a candidate number of clusters. Secondly, K-means method is applied to those banks on the factor scores of the financial indicators to attain a meaningful and useful set of clusters. Lastly, each cluster is interpreted and given a name through the examination of the cluster centroids. This analysis enables us to divide the banks which survived the global financial crisis into strategic groups.

IV. Empirical Analysis

4.1 Variables

We basically employ Shen's viewpoints and select nine bank-specific variables that are financial ratios based on balance sheet and income statement data. According to the literature review, these financial ratios providing a suitable basis to present bank performance are tabulated in Table IV-1.

Table IV-1 Definitions of the financial indicators

Indicator	Description
Risk adjusted capital ratio	$(\text{Tier 1 capital} + \text{Tier 2 capital}) / \text{Risk-weighted assets}$
Coverage ratio	$\text{Loan loss reserves} / \text{Non-performing loans}$
Noninterest expense	$(\text{Noninterest expense} - \text{Provision for credit losses}) / \text{Total revenues, net of interest expense}$
Average earnings per employee	$\text{Pretax income} / \text{The number of employees}$
Net interest income	$\text{Net interest income} / \text{Total revenues, net of interest expense}$
Noninterest income	$\text{Noninterest income} / \text{Total revenues, net of interest expense}$
Total deposits	$\text{Total deposits} / \text{Total liabilities}$
Liquidity reserve ratio	$\text{Liquid assets} / \text{Total deposits}$
Size	Natural logarithm of Total assets

Risk adjusted capital ratio is the ratio which measures a bank's capability of meeting the risks relating to loans, including credit risk, market risk, and operational risk. The New Basle Capital Accord requests this ratio to be not less than eight percent. In the Basle Capital Accord, Tier 1 capital is composed of core capital, which consists primarily of equity capital and disclosed reserves. Additionally, Tier 2 capital is composed of supplementary capital, which is categorized as undisclosed reserves, revaluation reserves, general loan-loss reserves, hybrid debt capital instruments, and subordinated term debt.

Coverage ratio appraises a bank's asset quality. Loan loss reserves are used to

write off bad debts while non-performing loans are unable to be collected. The International Monetary Fund (IMF) defines a non-performing loan as a loan is nonperforming when payments of interest and principal are past due by 90 days or more, or at least 90 days of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full. Generally speaking, a bank's unsoundness appears on its deteriorating asset quality. At first, an unhealthy bank suffers a lot of uncollectable non-performing loans. After that, it accrues a great deal of provision for loan loss to write off these bad debts, and its earnings in turn diminish. To a certain extent, the bank goes bankrupt.

Average earnings per employee assesses a bank's management quality. Owing to financial liberalization and international management environment, there is intense competition among banks, and the risks they run are getting higher. If a bank shies away from innovation, its impaired efficiency or wrong strategic decision can land itself in a difficult position. As a result, a high-performing bank not only maximizes profits but also seeks after fine management quality.

Noninterest expense to total revenues, net interest income to total revenues, and noninterest income to total revenues approximately depict a bank's income structure. As implied by the name, noninterest expense excludes interest expense. Additionally, it excludes provision for credit losses. Net interest income refers to the difference between interest income received from borrowers and interest expense paid to depositors. As implied in the name, noninterest income equals the total amount of various incomes except net interest income. By studying these three ratios, we could be aware how a bank acquires revenues and how it allots the money. This enables us to further grasp its business strategy.

Total deposits to total liabilities evaluates a bank's liquidity. Deposits are the chief liabilities to a commercial bank. When a bank accepts deposits, it needs to meet depositors' withdrawals from their account any time. On the other hand, the bank has to make profits through lending or investing in financial assets in order to pay promised interest to its depositors. Consequently, it cannot keep all the savings in its vault. To sum up, it faces high liquidity risk while possessing a large proportion of total deposits to total liabilities.

Liquidity reserve ratio also appraises a bank's liquidity. Liquid assets refer to cash and short investments which can easily be sold for cash. A bank needs to maintain a moderate liquidity reserve ratio to meet its savers' withdrawals from their account any time.

We make use of the natural logarithm of total assets to measure size. We want to know whether size is an important element in a bank's resource configuration and whether big banks or small banks own competitive advantage.

4.2 The general situation of banking industry

We intend to portray the general situation of banking industry during the years 2004-2008 through the descriptive statistics of the sample banks.

Table IV-2 Descriptive statistics of the sample banks

	Minimum	Maximum	Mean	Std Dev	Skewness	Kurtosis
ROA	-0.42	1.93	0.91	0.51	-0.35	-0.24
Risk adjusted capital ratio	8.23	21.95	12.73	1.81	1.68	7.51
Coverage ratio	41.43	1469.20	315.81	263.66	2.37	6.83
Noninterest expense	-23.24	288.23	61.08	28.47	5.88	50.48
Average earnings per employee	-18.29	152.70	57.89	33.89	0.46	0.37

(USD in millions)						
Net interest income	24.70	240.97	72.92	25.35	3.82	23.67
Noninterest income	-140.97	75.30	27.08	25.35	-3.82	23.67
Total deposits	23.98	94.47	76.20	12.49	-1.62	3.89
Liquidity reserve ratio	1.14	22.02	5.52	4.02	2.45	5.96
Size (USD in millions)	2.54	6.27	4.21	0.75	0.87	0.47

As displayed in Table IV-2, relative to the industry average, more of the sample banks have a larger proportion of noninterest income to total revenues and a higher proportion of total deposits to total liabilities. On the other hand, relative to the industry mean, they show lower risk adjusted capital ratio, smaller coverage ratio, a lower proportion of noninterest expense to total revenues, a smaller proportion of net interest income to total revenues, and lower liquidity reserve ratio.

We hereby consider that deposits are still the principal liabilities to a commercial bank. Besides, due to financial liberalization and innovation, banks gradually head for the business which is able to raise noninterest income. The late 2000s financial crisis seriously worsens their capital adequacy and causes them to sustain giant bad debts. They also cut the workforce to decrease noninterest expense. Furthermore, the liquidity of short investments is poor since everyone wants to keep cash in hand at that time.

4.3 The outcome of factor analysis

This paper executes factor analysis of the financial data of the eighty-four commercial banks in the five advanced economies in order to identify a smaller set of prominent factors to take the place of the original set of financial indicators. We put into action the VARIMAX orthogonal factor rotation to facilitate interpretations. Table IV-3

displays the results of the VARIMAX rotation of the five extracted factors.

Table IV-3 Principal component analysis of financial indicators and the resulting resource configurations

Resource configuration	Indicator	Factor loading	Eigenvalue	Variance explained	Cumulative variance
Factor 1 Customer relationship advantage	Net interest income	0.97	2.70	29.97%	29.97%
	Noninterest income	-0.97			
	Noninterest expense	0.42			
Factor 2 Organization management ability	Average earnings per employee	0.97	1.92	21.35%	51.32%
	Liquidity reserve ratio	0.17			
Factor 3 Asset management ability	Coverage ratio	0.98	1.33	14.76%	66.08%
Factor 4 Risk management ability	Risk adjusted capital ratio	0.97	1.12	12.40%	78.48%
Factor 5 Liability management capacity	Total deposits	0.93	0.79	8.73%	87.21%
	Size	-0.33			

As revealed in Table IV-3, we retain the five factors whose eigenvalue is at least 0.75. What's more, the cumulative proportion that the five factors contribute to the total

variation amounts to 87.21%.

Factor 1 represents customer relationship advantage. Banks holding outstanding customer relationship advantage are capable of earning more net interest income through wider interest spread or earning more noninterest income by charging clients more service fees and commission. Besides, banks pay more personnel expense and other general operating expense to satisfy their customers. In other words, banks disburse more noninterest expense to strengthen customer relationship. Therefore, banks with high positive score on this factor would exhibit that they have both larger proportion of net interest income to total revenues and larger proportion of noninterest expense to total revenues. Banks with high negative score on this factor would show that they possess larger proportion of noninterest income to total revenues but smaller proportion of noninterest expense to total revenues.

Factor 2 measures organization management ability. The greater organization management, the higher employee productivity. As a result, each employee makes more profits for his company. Furthermore, a bank would maintain appropriate liquidity reserve ratio to ensure liquidity. A bank demonstrating remarkable organization management ability reinforces depositors' confidence in its soundness, which will decrease the probability that depositors withdraw their savings in a panic. So, banks with high positive score on this factor would display that they own excellent employee productivity and greater liquidity.

Factor 3 appraises asset management ability. On the whole, higher coverage ratio is a sign of superior asset management ability. How many loan loss reserves a bank would accrue primarily rest on its lending experience. A bank having difficulty in collecting non-performing loans would accrue many loan loss reserves and hence has high coverage ratio. From this viewpoint, a bank holding high coverage ratio appears to

demonstrate weak asset management ability. From another angle, when a bank thinks that bad debts would probably increase in the future, it would accrue many loan loss reserves and thus raise coverage ratio to ensure asset quality. During the late 2000s economic depression, we believe that banks tend to maintain higher coverage ratio for the latter reason. Thus, banks with high positive score on this factor would exhibit that they possess higher coverage ratio.

Factor 4 indicates risk management ability. Normally, higher risk adjusted capital ratio means prominent risk management ability. A bank's capital is orientated towards a buffer while a bank incurs a bad debt loss. Heavy bad debt losses would cause a bank to default on its payments for liabilities. Thus, banking supervisors in most countries determine and monitor risk adjusted capital ratio to protect depositors and thereby maintain their confidence in the banking system. For that reason, banks with high positive score on this factor would display that they own higher risk adjusted capital ratio.

Factor 5 assesses liability management capacity. In general, banks holding exceptional liability management capacity have larger proportion of non deposits to liabilities and bigger size. A large proportion of total deposits to total liabilities implies high liquidity risk especially when depositors lack confidence in the payment capacity of the bank. Thus, a bank run is likely to happen, which lead the bank's condition to deteriorate further. Additionally, there exists a phenomenon that banks are too big to fail. Big banks can gain a bailout from Government in financial difficulties for the reason that Government worries that their failure would result in a snowball effect on the overall economy. Consequently, banks are encouraged to become large businesses. From another angle, large banks get finance more easily than small ones do. For example, they can issue financial debentures to raise funds. Accordingly, banks with

high positive score on this factor would exhibit that they have larger proportion of deposits to liabilities but smaller size. Banks with high negative score on this factor would show that they possess larger proportion of non deposits to liabilities and bigger size.

4.4 The result of cluster analysis

In factor analysis, we identify five salient factors to replace the nine financial indicators. Now, we move to two-stage clustering for deciding the number of clusters and discovering strategic groups afterward.

Table IV-4 Statistics for deciding the number of clusters

	SPRSQ	RSQ	PSF	PST2
Six clusters	0.0092	0.936	229	5.8
Five clusters	0.0172	0.919	224	24.2
Four clusters	0.0291	0.890	216	32.2
Three clusters	0.0961	0.794	156	84.9
Two clusters	0.2579	0.536	94.7	101

The objective of cluster analysis is to classify banks into relatively homogeneous groups. The criteria we utilize to decide the number of clusters include the semipartial R square (SPRSQ), the R square (RSQ), the pseudo F (PSF), and the pseudo t^2 (PST2). The SPRSQ value represents the increase in heterogeneity resulting from joining two clusters. If the SPRSQ value increases relatively large in certain step, the process to join two clusters should stop. Thus, the SPRSQ suggests three clusters. The RSQ value measures the heterogeneity among clusters. If the RSQ value decreases relatively large in certain step, the procedure to join clusters should stop. As a result, the RSQ suggests three clusters. Another method of judging the number of clusters is to look at the PSF statistic. Relatively large values indicate good numbers of clusters. Consequently, the PSF statistic suggests six clusters. To interpret the values of the PST2 statistic, look

down the column until we find the first value noticeably larger than the previous value and then move back up the column by one step. Accordingly, we can see a good clustering level at three clusters.

Considered together, these statistics suggest that the data can be clustered into three clusters. After that, we examine the cluster centroids to describe the three clusters.

Table IV-5 Cluster centroids of the three clusters

Strategic group	The number of banks	Factor 1 Customer relationship advantage	Factor 2 Organization management ability	Factor 3 Asset management ability	Factor 4 Risk management ability	Factor 5 Liability management capacity
Cluster 1 Default risk management reinforced cluster	17	-0.151	-0.130	-0.227	1.375	-0.234
Cluster 2 Profit oriented cluster	19	-0.139	0.939	0.837	-0.166	-0.599
Cluster 3 Conservative business cluster	48	0.109	-0.325	-0.251	-0.421	0.320

Examining the cluster centroids enables us to interpret and profile the three clusters and then denominate each of the three clusters. As shown in Table IV-5, banks which are classified as Cluster 1 have exceptional risk management ability. The better risk management ability, the more default risk resulting from bad debts is reduced. Therefore, Cluster 1 could be named as default risk management reinforced cluster.

Banks which are classified as Cluster 2 demonstrate outstanding organization

management ability, asset management ability, and liability management capacity. The reason may be that their loan structure possesses larger proportion of consumer loans to total loans, larger proportion of lease financing to total loans, etc. which lead them to take higher credit risk. Hence, they charge clients higher interest rate and hence gain more earnings. At the same time, they accrue more loan loss reserves in case credit crises take place. Additionally, their liabilities less come from deposits. Compared with deposits, non deposits are more flexible and stable. Moreover, the size of these banks is bigger than that of the banks in other groups. Accordingly, these banks could take lower liquidity risk, easily acquire funds, and flexibly invest funds in financial assets to boost profits. As a result, Cluster 2 could be named as profit oriented cluster.

Most banks are classified as Cluster 3. Compared with the banks in other groups, they display bigger customer relationship advantage. On the other hand, they exhibit weak organization management ability, asset management ability, risk management ability, and liability management capacity. We think that they give first place to deposit and loan business, so their revenues mainly depend on net interest income. This will bring them higher liquidity risk and credit risk. When the economy goes down sharply, they are subject to more non-performing loans so that their loan loss reserves cannot cover. Afterward, their earnings and capital adequacy deteriorate. Consequently, Cluster 3 could be named as conservative business cluster.

After giving names to the three clusters, we make an effort to survey the financial performance of the representative banks in each cluster, as presented in Table IV-6. The bank list of each cluster is tabulated in Appendix 1.

Table IV-6 Representative banks in each cluster

Company	ROA	Risk adjusted capital ratio	Coverage ratio	Noninterest expense	Average earnings per employee	Net interest income	Noninterest income	Total deposits	Liquidity reserve ratio	size
Cluster 1 Default risk management reinforced cluster	BB&T CORP, STANDARD CHARTERED PLC, HSBC HLDGS PLC									
BB&T CORP	1.39	13.90	262.63	54.13	83.95	59.27	40.73	74.00	2.86	5.09
STANDARD CHARTERED PLC	1.00	14.74	249.16	60.42	60.51	60.71	39.29	71.38	4.91	5.41
HSBC HLDGS PLC	0.84	12.66	99.47	52.73	64.14	52.04	47.96	60.41	4.44	6.27
Cluster 2 Profit oriented cluster	U S BANCORP, PNC FINANCIAL SVCS GROUP INC, BANK OF NEW YORK MELLON CORP, BANK OF AMERICA CORP									
U S BANCORP	1.93	12.94	318.76	46.54	108.16	52.40	47.60	64.98	5.93	5.35
PNC FINANCIAL SVCS GROUP INC	1.49	12.42	294.30	65.12	82.85	40.28	59.72	72.27	12.01	5.10
BANK OF NEW YORK MELLON CORP	1.34	13.51	399.56	68.93	82.27	24.70	75.30	70.58	17.87	5.13
BANK OF AMERICA CORP	1.12	11.72	350.25	52.03	106.90	54.54	45.46	54.40	22.02	6.16
Cluster 3 Conservative business cluster	SUNTRUST BANKS INC, NATL WESTMINSTER BANK, FIFTH THIRD BANCORP, DEUTSCHE POSTBANK AG									
SUNTRUST BANKS INC	0.96	11.28	203.96	62.58	67.44	57.46	42.54	72.74	5.01	5.25
NATL WESTMINSTER BANK	0.84	13.85	65.17	55.83	88.77	53.94	46.06	81.05	19.43	5.43
FIFTH THIRD BANCORP	0.71	11.38	198.28	55.38	47.73	55.53	44.47	72.43	5.52	5.02
DEUTSCHE POSTBANK AG	0.24	10.45	51.13	80.01	33.69	63.39	36.61	79.93	2.68	5.24
Industry average	0.91	12.73	315.81	61.08	57.89	72.92	27.08	76.20	5.52	4.21

On the whole, BB&T Corporation, Standard Chartered plc, and HSBC Holdings plc classified into default risk management reinforced cluster demonstrate exceptional risk management ability for the reason that they possess higher risk adjusted capital ratio.

Additionally, U.S. Bancorp, PNC Financial Services Group, Inc., Bank of New York Mellon Corporation, and Bank of America Corporation categorized into profit oriented cluster display remarkable organization management ability, asset management ability, and liability management capacity since they own higher employee productivity, larger liquidity reserve ratio, higher coverage ratio as well as lower total deposits to total liabilities. These banks also present unsurpassed return on average assets.

Besides, Sun Trust Banks, Inc., National Westminster Bank, Fifth Third Bancorp, and Deutsche Postbank AG sorted into conservative business cluster exhibit their dependence on net interest income as the chief source of revenues. Nevertheless, these banks show the poorest return on average assets.

We also notice that Standard Chartered plc, and HSBC Holdings plc, Bank of New York Mellon Corporation, and Bank of America Corporation are global financial institutions. Nevertheless, the banks grouped into conservative business cluster are either national or regional companies. These findings make us assume that global corporations are able to diversify risks effectively. For example, HSBC Holdings plc provides financial services around the world, such as the Americas, Asia Pacific, and Europe. Each of the major financial markets represents about one third of its business. Although it is at the centre of the late 2000s financial storm, this wider group weathers the financial crisis. From another angle, global banks normally are big banks, and they have the capability to develop innovative financial products. For example, Bank of America Corporation, one of the banking giants, offers customers not only conventional banking services but also diversified financial services, such as capital management, treasury solutions, asset management, wealth management, etc. relative to small or middle banks. On the other hand, Germany banks are well known for their conservative business operations. This explains why most of the Germany banks are classified into

conservative business cluster.

In the end, we examine their financial performance and find out which cluster owns competitive advantage.

Table IV-7 Financial performance of the three clusters

Financial performance	Cluster 1 Default risk management reinforced cluster	Cluster 2 Profit oriented cluster	Cluster 3 Conservative business cluster	Industry average
ROA	0.98	1.14	0.79	0.91
Risk adjusted capital ratio	15.10	12.35	12.05	12.73
Coverage ratio	248.21	545.78	248.73	315.81
Noninterest expense	54.22	56.32	65.40	61.08
Average earnings per employee (USD in millions)	52.55	92.61	46.05	57.89
Net interest income	66.86	69.10	76.58	72.92
Noninterest income	33.14	30.90	23.42	27.08
Total deposits	76.19	71.17	78.20	76.20
Liquidity reserve ratio	5.94	7.15	4.72	5.52
Size (USD in millions)	4.12	4.35	4.20	4.21

As revealed in Table IV-7, profit oriented cluster exhibits the most excellent return on average assets. This cluster has the highest coverage ratio, below-average noninterest expense to total revenues, the greatest employee productivity, above-average noninterest income to total revenues, the lowest total deposits to total liabilities, the highest liquidity reserve ratio, and the biggest size. Thus, we can infer that brilliant

organization management ability, asset management ability, and liability management capacity make a great contribution to the cluster's distinguished financial performance. Similarly, default risk management reinforced cluster displays better return on average assets. This cluster demonstrates the highest risk adjusted capital ratio, the lowest noninterest expense to total revenues, and the highest noninterest income to total revenues. Therefore, we can consider that risk management ability also plays an important role in the cluster's fine financial performance.

On the contrary, conservative business cluster shows poor return on average assets. It exhibits inferior organization management ability through the lowest employee productivity and the lowest liquidity reserve ratio. In addition, it relies on net interest income much more than profit oriented cluster and default risk management reinforced cluster do. This character leads its revenues to drop off for the reason that every central bank reduces interest rates during the period of the late 2000s economic recession. It is also worthy to notice that it presents the highest noninterest expense to total revenues. The reason may be that it spends noninterest expense in order to collect non-performing loans rather than to enhance customer relationship.

To sum up, we can say that profit oriented cluster and default risk management reinforced cluster possess better resource configurations, and hence acquire exceptional return on average assets. Their competitive advantage not only enables them to survive the late 2000s financial crisis but also brings them outstanding financial performance. In other words, their business strategies are relatively ideal. Therefore, we suggest that any bank which aspires to superior performance think over their business strategies.

V. Conclusions

5.1 Research summary

This paper intends to discover the resource configurations of strategic groups consisting of the banks surviving the late 2000s financial crisis and propose business strategies for them. The sample analyzed in this paper consists of eighty-four commercial banks in the United States, the United Kingdom, Germany, France, and Japan. According to the outcome of factor analysis, we extract five resource configurations from nine financial indicators as follows: customer relationship advantage, organization management ability, asset management ability, risk management ability, and liability management capacity. After that, we carry out cluster analysis to classify those banks into three strategic groups as given in the list below: default risk management reinforced cluster, profit oriented cluster, and conservative business cluster. Next, we examine each strategic group's financial performance and discover that profit oriented cluster and default risk management reinforced cluster present remarkable financial performance arising from their distinguished competitive advantage.

In order to obtain competitive advantage, we put forward business strategies for banking industry worldwide. First, banks should develop derivatives to not only increase earnings but also supply diversified financial products to satisfy clients. Second, facing the fact that net interest income is diminishing, banks should add noninterest income, such as service fees and commission, to revenues without affecting their risk adjusted capital ratio. Third, banks should sell loan-backed assets to raise risk adjusted capital ratio. Fourth, banks should merge or cooperate with domestic banks or foreign banks to pursue suitable economies of scale and improve their competitiveness. Finally, in view of the lesson we learned from the late 2000s financial crisis, banks should

moderately leverage and fully inform clients of the risks when they make an investment in financial products.

5.2 Limitations in this research

The source of the bank-specific data utilized in this research is from the Compustat database. The sample analyzed in this paper only comprises commercial banks in the five advanced economies. Moreover, we exclude those banks lacking complete financial information from the sample. Consequently, we do not get entire industry information to support this research's conclusions.

Furthermore, the nine financial indicators adopted in empirical analysis are important. Nonetheless, a number of financial indicators, such as non-performing loans to total loans, commercial loans to total loans, consumer loans to total loans, mortgage loans to total loans, etc., are not included in this research, and they are able to more depict bank financial structure and lead us to work out more accurate business strategies.

5.3 Extensions of further research

There are several suggested extensions of further researches as follows.

First of all, this paper only focuses on commercial banks in the five advanced economies. Further researches could extend into commercial banks in other countries. What's more, this research emphasizes nothing more than the commercial banks whose SIC Code is 6020. Further researches could extend into other banking organizations, such as investment banks, savings institutions, credit institutions, mortgage bankers, etc., to discover the similarities and the differences in competitive advantage between commercial banks and other banking institutions. It is possible to draw a conclusion as a rule of great generality for the whole banking industry.

Secondly, we already find out that profit oriented cluster and default risk

management reinforced cluster hold competitive advantage. Further researches could survey whether these two clusters continue to perform excellently as time goes by. In addition, further researches could inspect whether those banks demonstrating poor performance imitate these two clusters' business strategies and then follow their financial performance to see whether they are getting better or worse.



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Appendix 1 The bank list of each cluster

Strategic group	Bank name
<p>Cluster 1</p> <p>Default risk management reinforced cluster</p>	<p>BB&T CORP</p> <p>CITY HOLDING COMPANY</p> <p>COMMUNITY BANK SYSTEM INC</p> <p>CORUS BANKSHARES INC</p> <p>FIRST FINL BANKSHARES INC</p> <p>FIRST HORIZON NATIONAL CORP</p> <p>GLACIER BANCORP INC</p> <p>HOME BANCSHARES INC</p> <p>INTL BANCSHARES CORP</p> <p>OLD NATIONAL BANCORP</p> <p>PARK NATIONAL CORP</p> <p>UMB FINANCIAL CORP</p> <p>ARBUTHNOT BANKING GROUP PLC (UK)</p> <p>HSBC HLDGS PLC (UK)</p> <p>STANDARD CHARTERED PLC (UK)</p> <p>NORINCHUKIN BANK (Japan)</p> <p>SHINKIN CENTRAL BANK (Japan)</p>
<p>Cluster 2</p> <p>Profit oriented cluster</p>	<p>BANK OF AMERICA CORP</p> <p>BANK OF HAWAII CORP</p> <p>BANK OF NEW YORK MELLON CORP</p> <p>CATHAY GENERAL BANCORP</p> <p>CITY NATIONAL CORP</p> <p>COMMERCE BANCSHARES INC</p> <p>EAST WEST BANCORP INC</p> <p>GUARANTY FINANCIAL GROUP INC</p> <p>INDEPENDENT BANK CORP/MA</p> <p>NARA BANCORP INC</p> <p>PNC FINANCIAL SVCS GROUP INC</p> <p>PRIVATEBANCORP INC</p> <p>PROSPERITY BANCSHARES INC</p> <p>SVB FINANCIAL GROUP</p> <p>U S BANCORP</p> <p>WESTAMERICA BANCORPORATION</p> <p>IKB DEUTSCHE INDUSTRIEBANK (Germany)</p> <p>BARCLAYS PLC (UK)</p> <p>SHOKO CHUKIN BANK (Japan)</p>

<p>Cluster 3</p> <p>Conservative business cluster</p>	<p>ASSOCIATED BANC-CORP</p> <p>BANCORPSOUTH INC</p> <p>BOSTON PRIVATE FINL HOLDINGS</p> <p>CADENCE FINANCIAL CORP</p> <p>CENTRAL PACIFIC FINANCIAL CP</p> <p>CITIZENS REPUBLIC BANCORP</p> <p>COLONIAL BANCGROUP</p> <p>COLUMBIA BANKING SYSTEM INC</p> <p>COMERICA INC</p> <p>CULLEN/FROST BANKERS INC</p> <p>F N B CORP/FL</p> <p>FIFTH THIRD BANCORP</p> <p>FIRST BANCORP P R</p> <p>FIRST COMMONWLTH FINL CP/PA</p> <p>FIRST MIDWEST BANCORP INC</p> <p>FRONTIER FINANCIAL CORP/WA</p> <p>FULTON FINANCIAL CORP</p> <p>HARLEYSVILLE NATL CORP/PA</p> <p>KEYCORP</p> <p>LAKELAND BANCORP INC</p> <p>MARSHALL & ILSLEY CORP</p> <p>NATIONAL PENN BANCSHARES INC</p> <p>PINNACLE FINL PARTNERS INC</p> <p>REGIONS FINANCIAL CORP</p> <p>SIMMONS FIRST NATL CP</p> <p>SOUTH FINANCIAL GROUP INC</p> <p>STERLING BANCSHRS/TX</p> <p>SUNTRUST BANKS INC</p> <p>SUSQUEHANNA BANCSHARES INC</p> <p>SYNOVUS FINANCIAL CORP</p> <p>TCF FINANCIAL CORP</p> <p>TOMPKINS FINANCIAL CORP</p> <p>TRUSTMARK CORP</p> <p>UCBH HOLDINGS INC</p> <p>UMPQUA HOLDINGS CORP</p> <p>UNITED BANKSHARES INC/WV</p> <p>UNITED COMMUNITY BANKS INC</p> <p>VALLEY NATIONAL BANCORP</p> <p>WEBSTER FINANCIAL CORP</p> <p>WHITNEY HOLDING CORP</p>
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	WILMINGTON TRUST CORP WINTRUST FINANCIAL CORP ZIONS BANCORPORATION CREDIT AGRICOLE SA (France) DEUTSCHE POSTBANK AG (Germany) LANDESBANK BADEN-WURTEMBERG (Germany) LANDESBANK HESSEN (Germany) NATL WESTMINSTER BANK (UK)
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Note: The parentheses following a bank name indicate which country the bank comes from. A bank name without parentheses represents that the bank comes from the United States.

