

Importance of Credit Guarantee Systems in SME Financing: Evidence from Asia

Naoyuki YOSHINO, Ph.D.

Dean, Asian Development Bank Institute (ADBI)
Professor Emeritus, Keio University, Japan

Farhad TAGHIZADEH-HESARY, Ph.D.

Faculty member, Keio University, Tokyo
Visiting Professor, The University of Tokyo



March 22, 2016

Outline

- 1. Importance of SMEs in Asian economies**
- 2. SMEs' difficulties in raising money**
- 3. Analysis of SME credit risk using Asian data**
- 4. Credit Guarantee Scheme**
- 5. Credit Guarantee Corporations in Asia**
- 6. A Model for the Optimal Credit Guarantee Ratio**
- 7. Empirical Survey**

1. Importance of SMEs in Asian economies

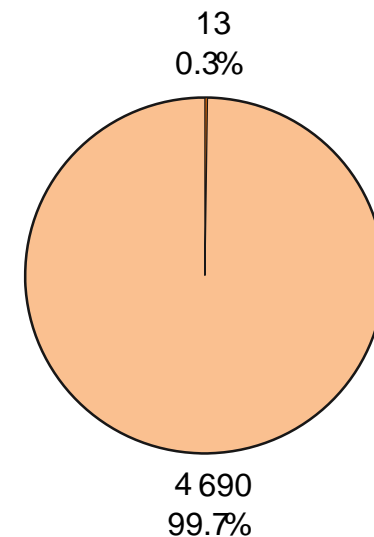
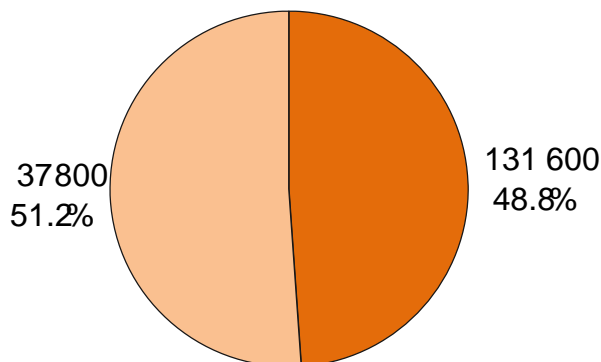
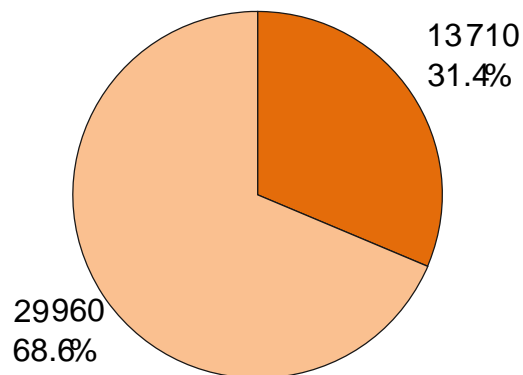
Share of Small and Medium-Sized Enterprises in Japan

Large Enterprises SMEs

Employment
(’000)

Sales (¥ billion)

No. of companies(’000)



SME = small and medium-sized enterprise.

Source: METI

Share of SMEs in Chinese Economy

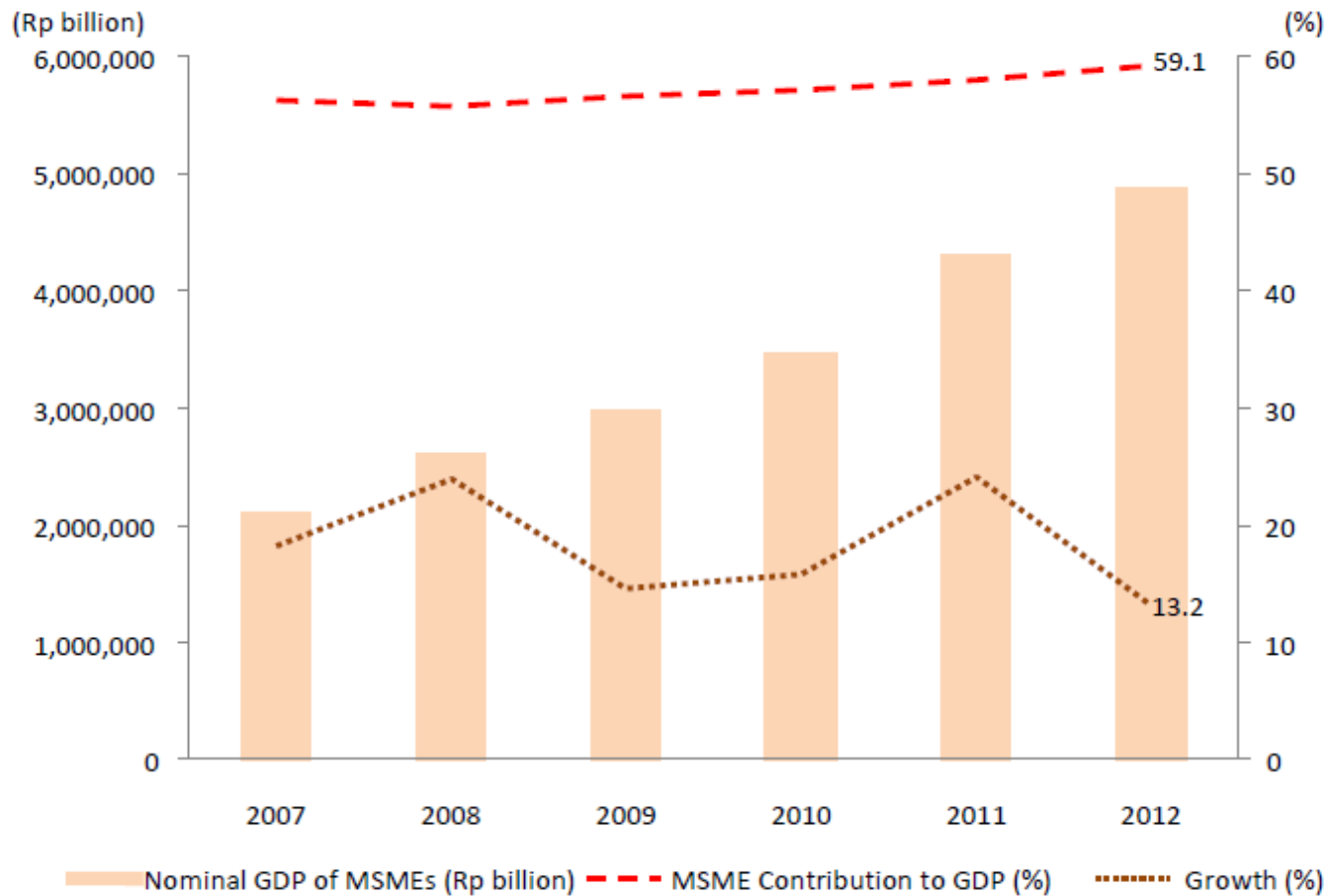
Item	2007	2008	2009	2010	2011 ^a	2012 ^a
Number of SMEs						
SMEs (number)	333,858	422,925	431,110	449,130	316,498	334,321
Share of SME Numbers	99.1	99.3	99.3	99.2	97.2	97.3
Employment by SMEs						
SME employees ('000)	60,521	68,671	67,877	72,369	59,357	...
Share of SMEs in Employment	76.8	77.7	76.9	75.8	64.7	...
SME Exports						
SME exports (CNY billion)	4,303	4,773	4,152	4,919	4,142	4,423
Share of SMEs in export	58.6	57.9	57.6	54.7	41.6	41.5

SME = small and medium-sized enterprise.

Notes: The data cover industrial enterprises above a certain operational scale. For 2007–2010, “above operational scale” refers to all industrial enterprises that generated a minimum annual income of CNY5 million from their core business. For 2011–2012, it refers to all industrial enterprises that generated a minimum annual income of CNY20 million from their core business. The industry sector includes mining; manufacturing; and electricity, gas, and water production and supply industries. Data for 2007–2010 are based on the number of employees fewer than 2,000, annual sales of CNY300 million or less, or total assets of CNY400 million or less. Medium-sized enterprises must have more than 300 employees, annual sales of more than CNY30 million, and total assets of CNY40 million or more; the rest are small businesses.

^a Data for 2011–2012 are based on the 2011 SME classification criteria. Industrial micro, small, or medium-sized enterprises are defined as enterprises that employ fewer than 1,000 persons or whose annual turnover does not exceed CNY400 million. A medium-sized enterprise is defined as an enterprise that employs more than 300 persons and whose annual turnover exceeds CNY20 million. A small enterprise is defined as one that employs more than 20 persons and whose annual turnover exceeds CNY3 million. A micro enterprise is defined as an enterprise that employs fewer than 20 persons or whose annual turnover does not exceed CNY3 million. Data on micro enterprises in 2011–2012 are not available.

Share of SMEs in Indonesia

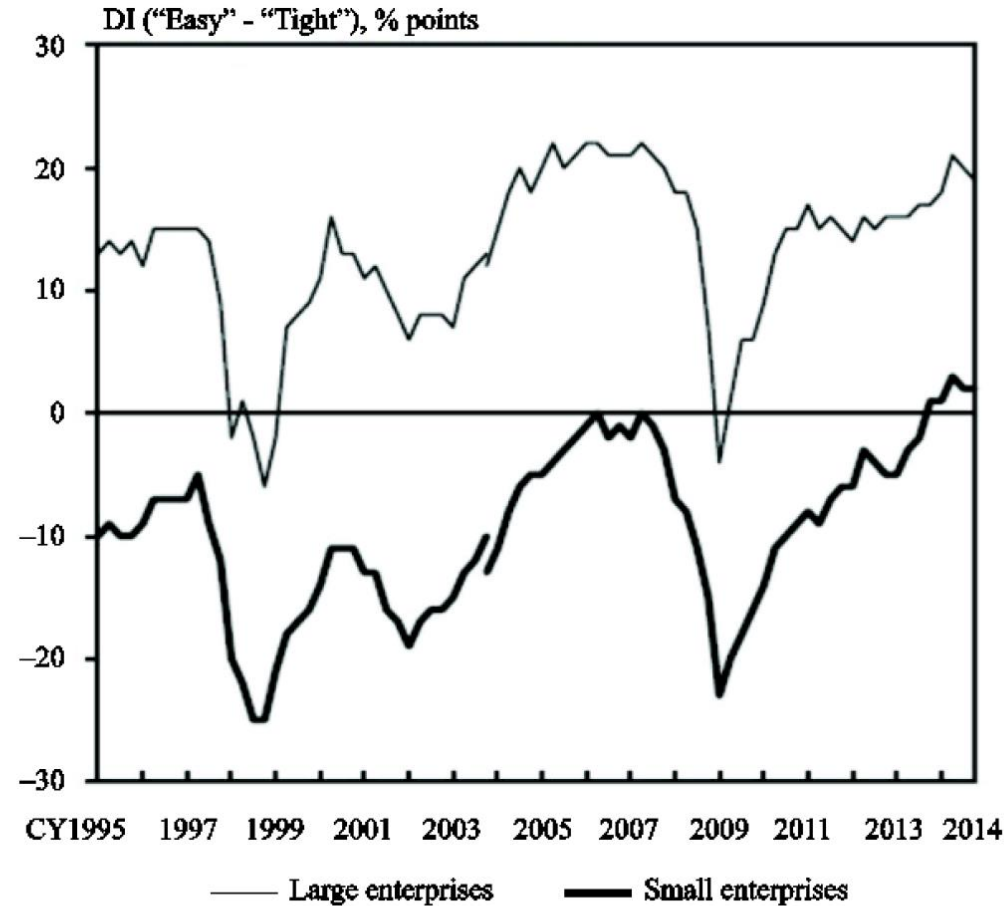


GDP = gross domestic product; MSME = micro, small, and medium-sized enterprise;
SME = small and medium-sized enterprise.

Note: Data include micro enterprises.

Source: Ministry of Cooperatives and SMEs of Indonesia.

2. SMEs' Difficulties in Raising Money

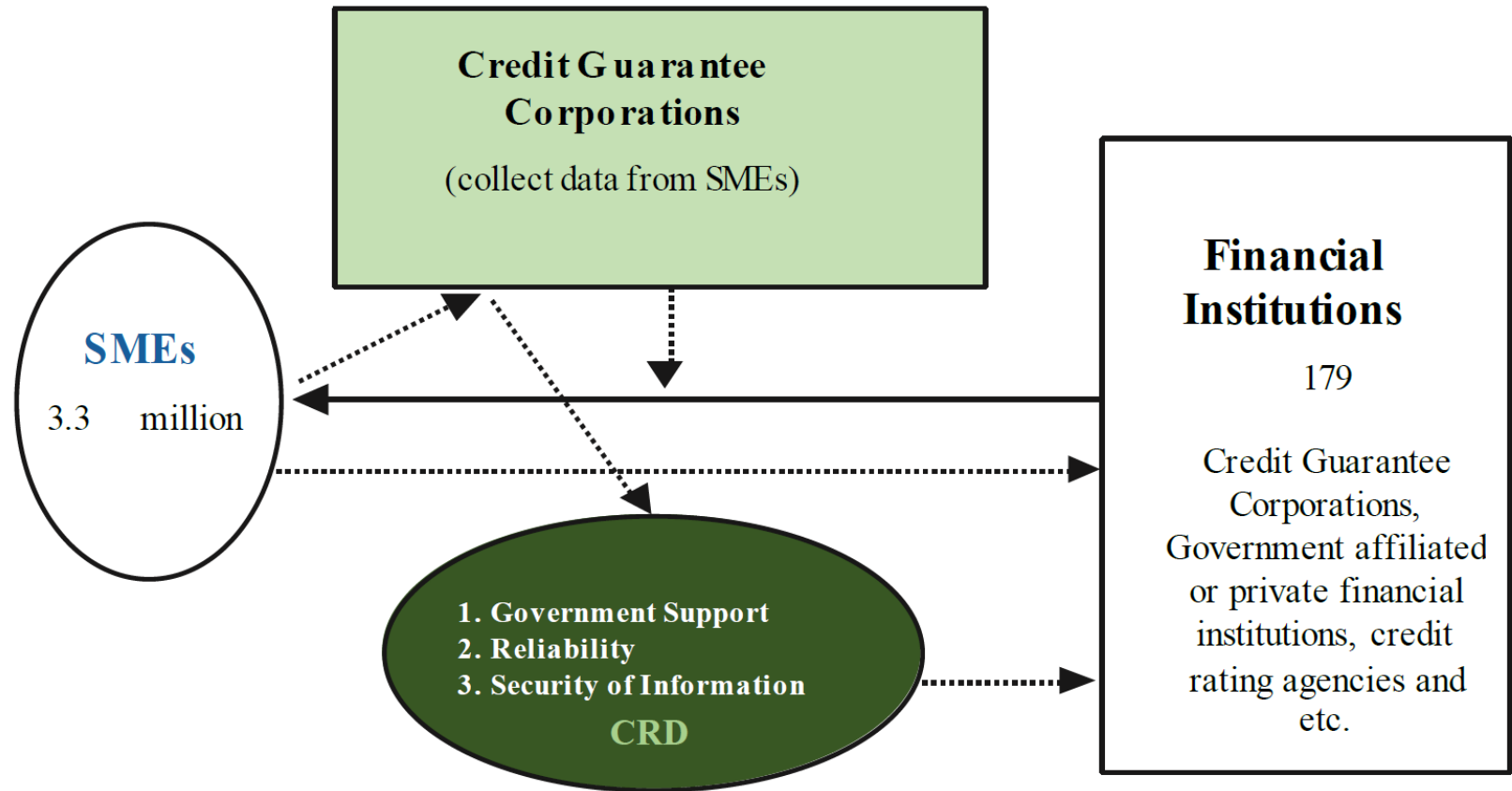


CY = commercial year, DI = diffusion index.

Note: The diffusion index is a method of summarizing the common tendency of a group of statistical series.

Source: Bank of Japan (BOJ). 2014. *Financial System Report October 2014*. Tokyo.

SMEs, CRD, CGCs and Banks



Source: Yoshino and Taghizadeh-Hesary (2015)

3. Analysis of SME credit risk using Asian data

- **Selection of the variables**
- **Principal Component Analysis**
- **Cluster Analysis**
- **Interpretation of the results**

Examined Variable

No.	Symbol	Definition	Category
1	Equity_TL	Equity (book value)/total liabilities	Leverage
2	TL_Tassets	Total liabilities/total assets	
3	Cash_Tassets	Cash/total assets	Liquidity
4	WoC_Tassets	Working capital/total assets	
5	Cash_Sales	Cash/net sales	
6	EBIT_Sales	Ebit/sales	Profitability
7	Rinc_Tassets	Retained earnings/total assets	
8	Ninc_Sales	Net income/sales	
9	EBIT_IE	Ebit/interest expenses	Coverage
10	AP_Sales	Account payable/sales	Activity
11	AR_TL	Account receivable/total liabilities	

Note: Retained earnings = the percentage of net earnings not paid out as dividends, but retained by the company to be reinvested in its core business or to pay debt. It is recorded under shareholders' equity in the balance sheet. Ebit = earnings before interest and taxes. Account payable = an accounting entry that represents an entity's obligation to pay off a short-term debt to its creditors. The accounts payable entry is found on a balance sheet under current liabilities. Account receivable = money owed by customers (individuals or corporations) to another entity in exchange for goods or services that have been delivered or used, but not yet paid for. Receivables usually come in the form of operating lines of credit and are usually due within a relatively short time period, ranging from a few days to a year.

Source: Yoshino and Taghizadeh-Hesary (2014)

Total Variance Explained



Component	Eigenvalues	% of Variance	Cumulative Variance %
Z1	3.30	30.00	30.00
Z2	2.19	19.90	49.88
Z3	1.25	11.38	61.26
Z4	1.08	9.78	71.03
Z5	0.94	8.56	79.60
Z6	0.75	6.79	86.37
Z7	0.56	5.09	91.47
Z8	0.48	4.36	95.82
Z9	0.32	2.87	98.69
Z10	0.13	1.14	99.84
Z11	0.09	0.17	100.00

Source: Yoshino and Taghizadeh-Hesary (2014)

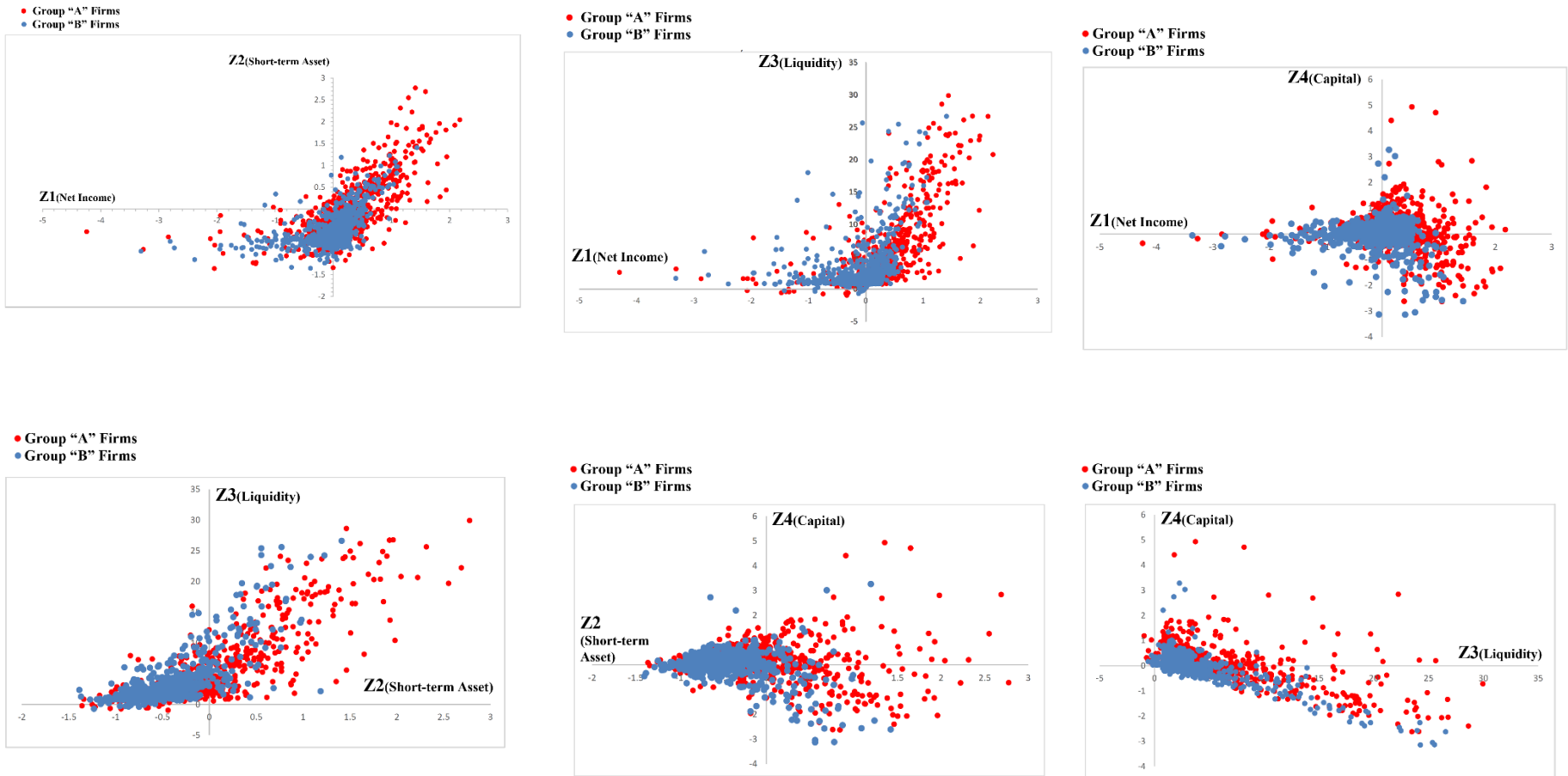
Factor Loadings of Financial Variables after Direct Oblimin Rotation

Variables (Financial Ratios)	Component			
	Z1	Z2	Z3	Z4
Equity_TL	0.009	0.068	0.113	0.705
TL_Tassets	-0.032	-0.878	0.069	-0.034
Cash_Tassets	-0.034	-0.061	0.811	0.098
WoC_Tassets	-0.05	0.762	0.044	0.179
Cash_Sales	-0.937	0.021	0.083	0.009
EBIT_Sales	0.962	0.008	0.024	-0.004
Rinc_Tassets	0.014	0.877	0.015	-0.178
Ninc_Sales	0.971	-0.012	0.015	0.014
EBIT_IE	0.035	0.045	0.766	-0.098
AP_Sales	-0.731	-0.017	-0.037	-0.016
AR_TL	0.009	-0.041	-0.104	0.725

Note: The extraction method was principal component analysis, The rotation method was direct oblimin with Kaiser normalization.

Source: Yoshino and Taghizadeh-Hesary (2014)

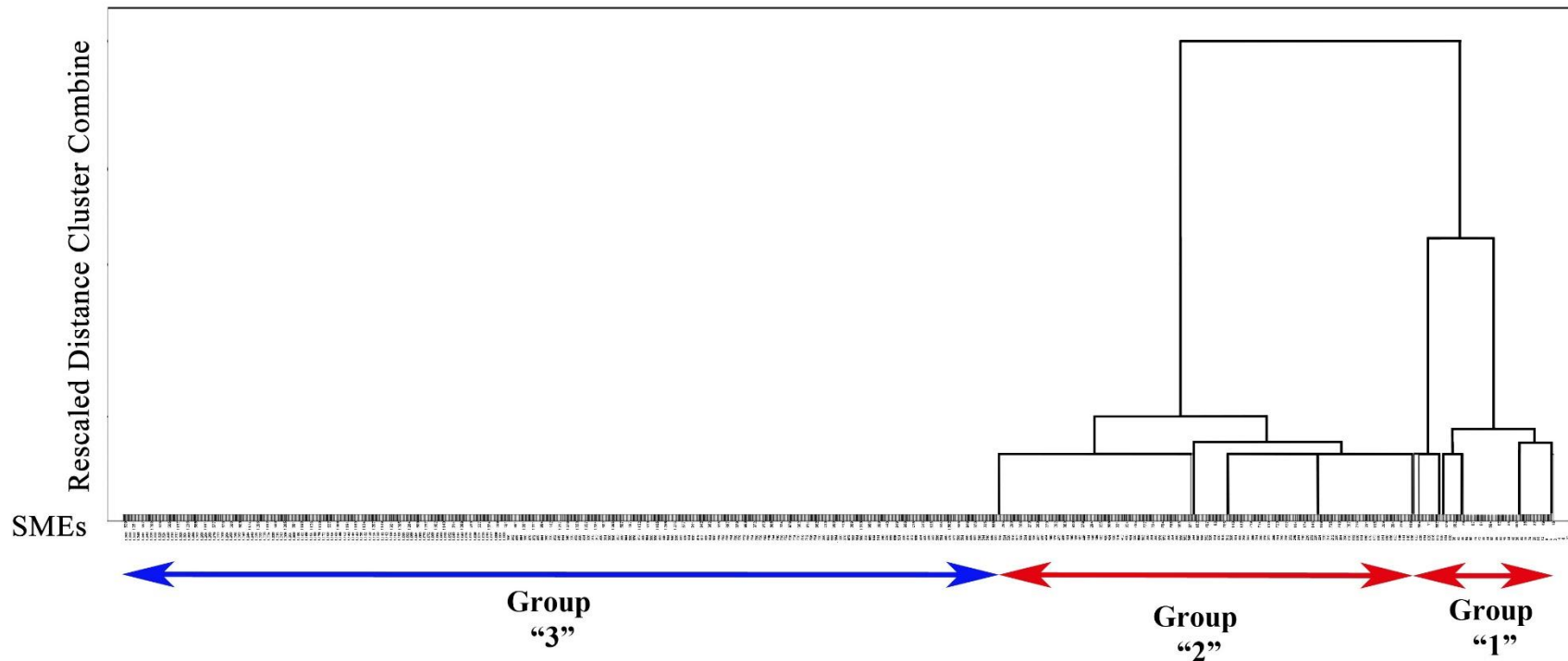
Distribution of Factors for Group A and B of SMEs



Source: Yoshino and Taghizadeh-Hesary (2014)

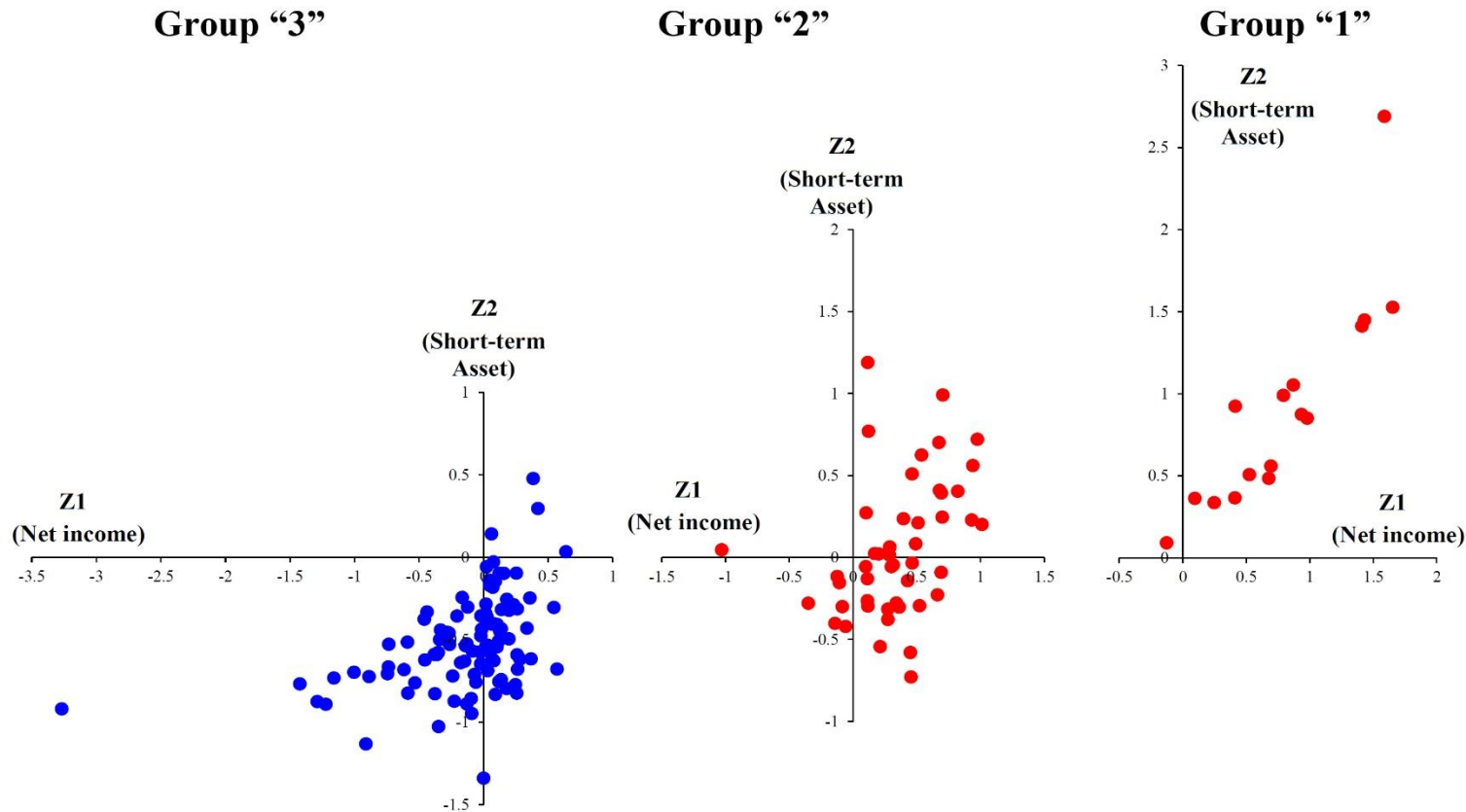
Cluster analysis: the average linkage method

Dendrogram Using Average Linkage



Source: Yoshino and Taghizadeh-Hesary (2014)

Grouping Based on Principal Component (Z1-Z2) and Cluster Analysis

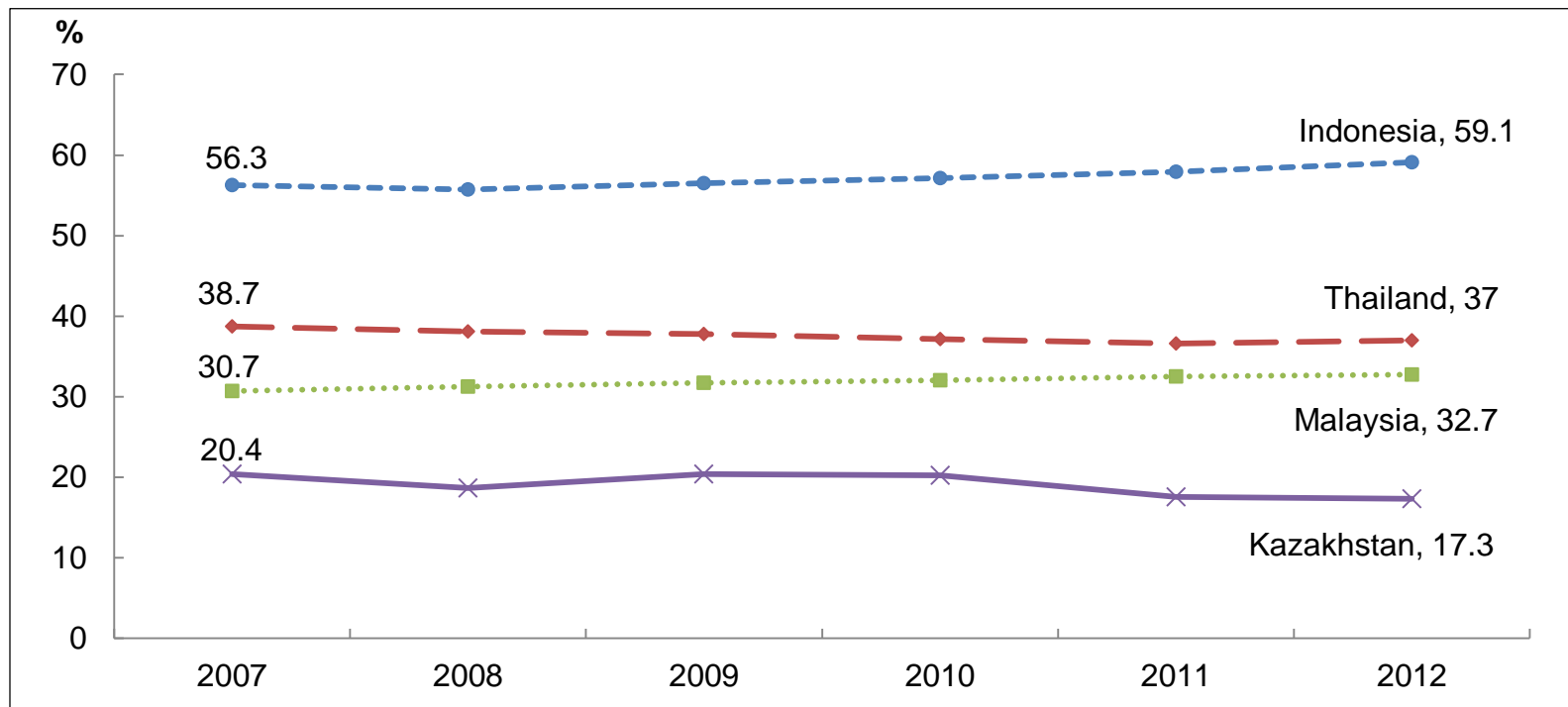


Note: Group 1 = healthiest SMEs; group 2 = in-between SMEs; group 3 = least healthy SMEs.

Source: Yoshino and Taghizadeh-Hesary (2014)

SME Credit Risk Analysis Using Bank Lending Data: An Analysis of Thai SMEs

Contribution of SMEs to GDP



SME NPLs are still high

Banking Sector–Small and Medium-sized Enterprise Loans in Thailand

Item	2007	2008	2009	2010	2011	2012	Q2 2013
Loans Outstanding							
SME loans to GDP* (%)	32.6	32	28.9	28.2	31.2	32.1	33.7
SME loans to total loans* (%)	44.5	38.5	33.4	32.6	33.7	32.3	32.8
SME loans, total (B billion)	...	...	...	3,640	4,391	4,826	5,048
SME loans, PFIs** (B billion)	...	...	...	786	1,099	1,180	1,102
SME loans, commercial banks (B billion)	2,775	2,907	2,609	2,854	3,292	3,646	3,946
Total loans, total (B billion)	7,394	8,856	9,473	10,955	12,493	14,222	15,020
Total loans, PFIs** (B billion)	1,165	1,307	1,666	2,192	2,711	2,944	3,006
Total loans, commercial banks (B billion)	6,229	7,549	7,807	8,763	9,782	11,278	12,014
Nonperforming Loans*							
SME NPLs (B billion)	...	...	186	154	131	126	133
Gross NPLs (B billion)	...	...	376	313	266	254	264
SME NPLs to SME loans (%)	...	...	7.1	5.4	4	3.5	3.4
SME NPLs to total loans (%)	...	...	2.4	1.8	1.3	1.1	1.1
Gross NPLs to total loans (%)	...	...	4.8	3.6	2.7	2.3	2.2

Source: ADB (2014)

SME credit Risk Analysis using Bank Lending data

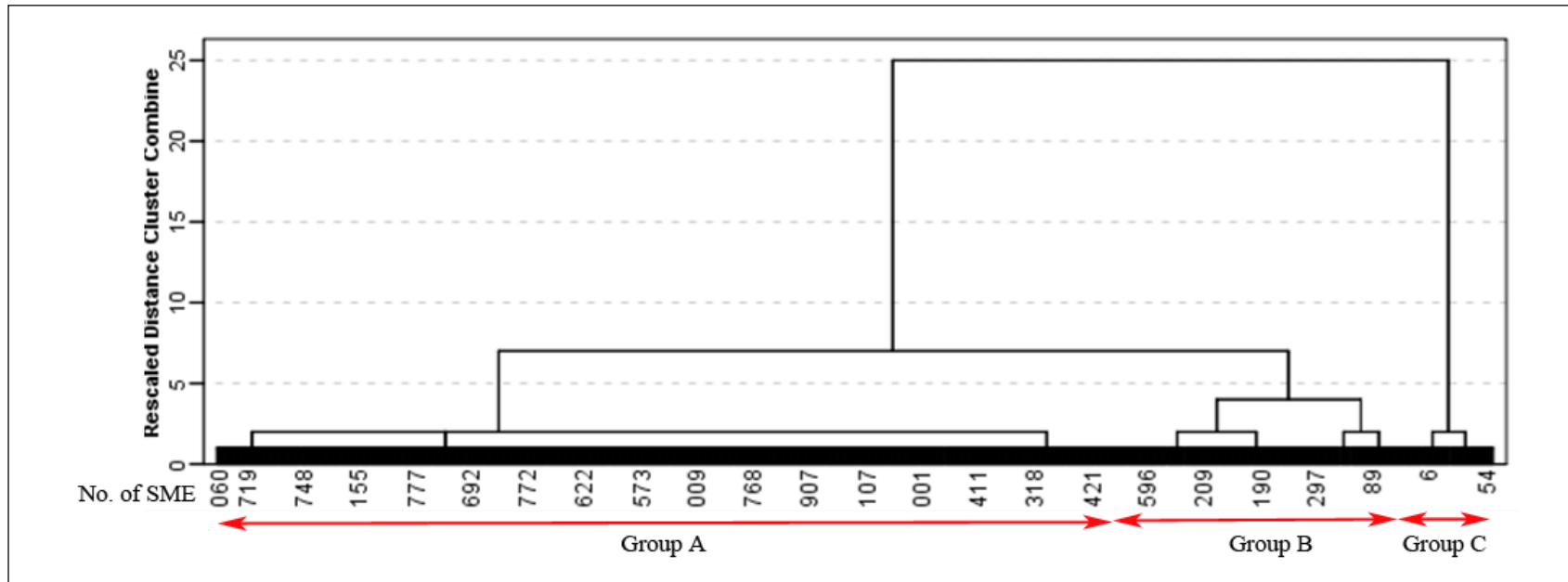
Description of Examined Variables

Series No.	Variable	Description	Mean	Minimum	Maximum
1	Initial amount	Principal amount	11,393,080	10,192	8,790,000,000
2	Past due days	Overdue days code	6.924817	1	11.00
3	Past due amount	Past due incurred	12,929,693	2	3,748,031,686
4	Total loans	Total loans lent	39,638,340	4	49,995,000,000
5	Outstanding amount	Outstanding amount	19,636,365	0	8,852,398,916

Source: Yoshino, Taghizadeh-Hesary, Charoensivakorn, Niraula (2015)

Statistical Analysis: PCA and Clustering

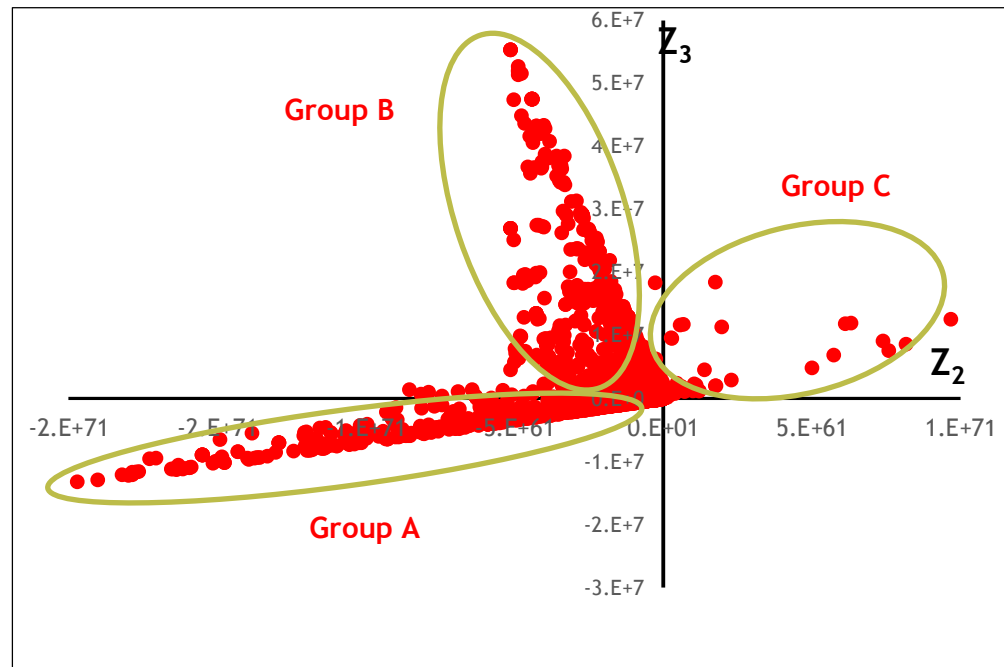
Dendrogram



Source: Yoshino, Taghizadeh-Hesary, Charoensivakorn, Niraula (2015)

Statistical Analysis: PCA and Clustering

Distribution of Factors



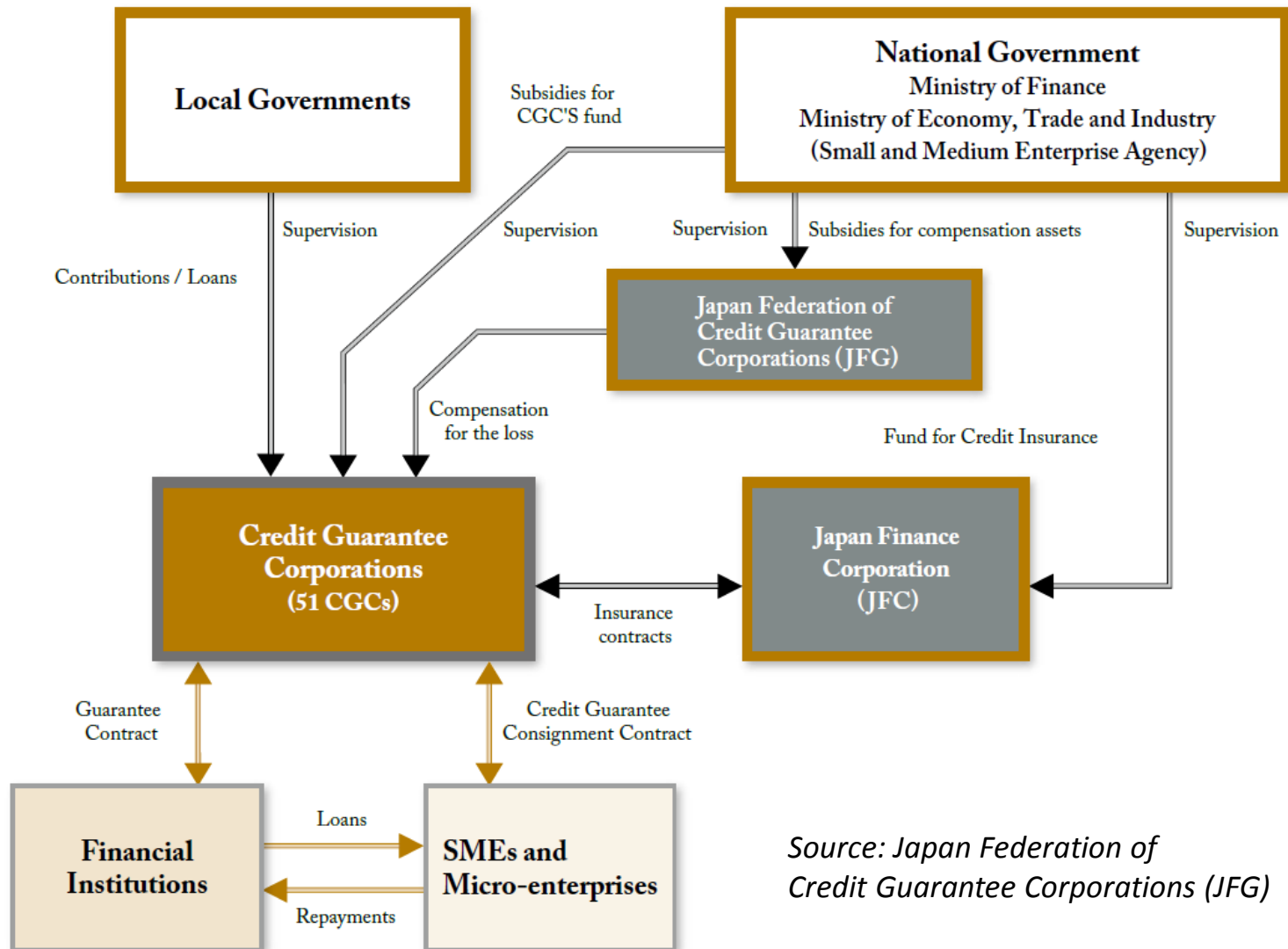
Note: the x-axis is the Z_2 component and the y-axis is the Z_3 component. Each dot shows one SME.

Source: Yoshino, Taghizadeh-Hesary, Charoensivakorn, Niraula (2015)

4.Credit Guarantee Scheme



Example: Credit Guarantee Scheme of Japan



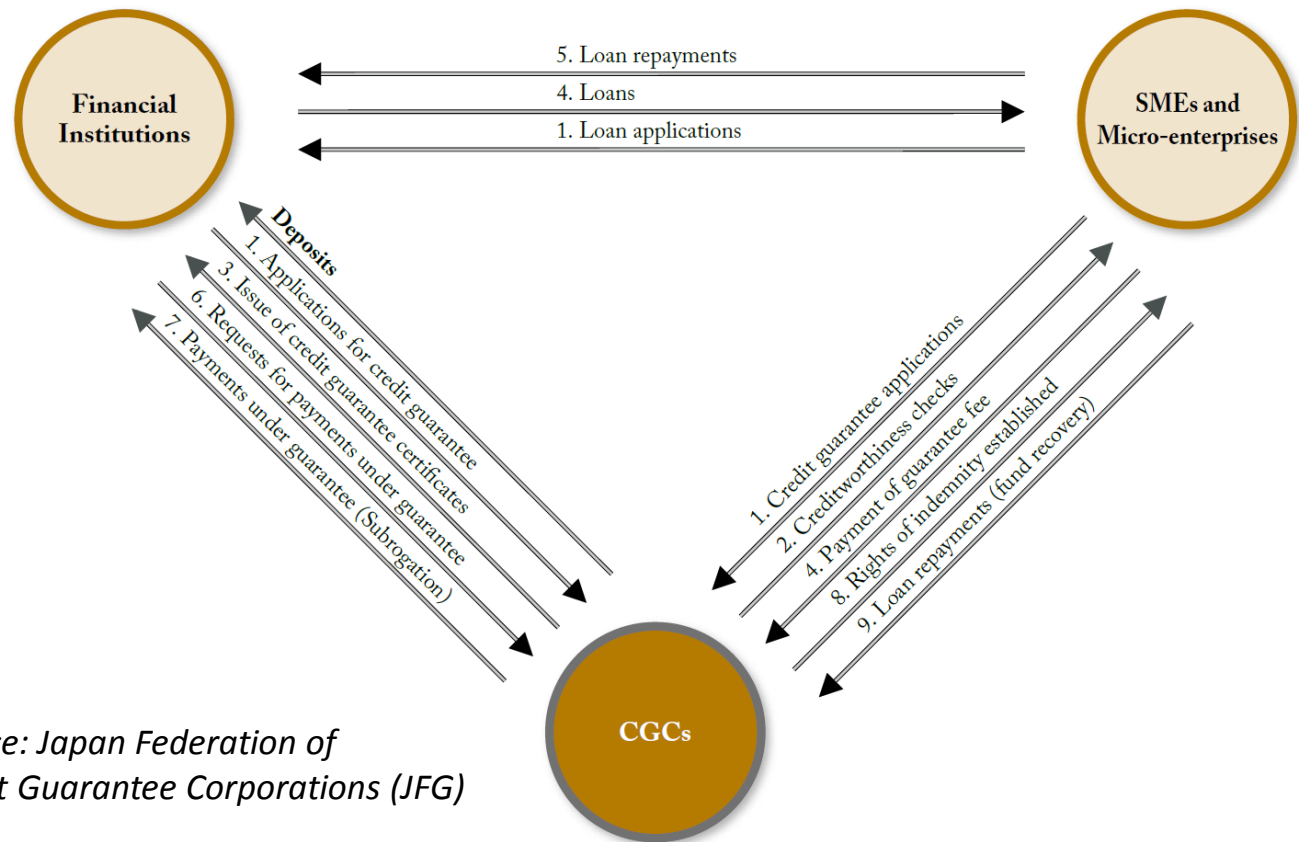
Source: Japan Federation of Credit Guarantee Corporations (JFG)

4.1. Objectives of Credit Guarantee Corporation (CGC)

CGCs are public institutions that support MSMEs by serving as guarantors to make it easier for them to borrow the funds necessary for their business operations from financial institutions.

CGCs improve the credit worthiness of MSMEs, which lack physical collateral and have weak credit standings. It helps direct funds to them from private financial institutions and provides them with smoother access to financing.

Credit Guarantee System flow of operation



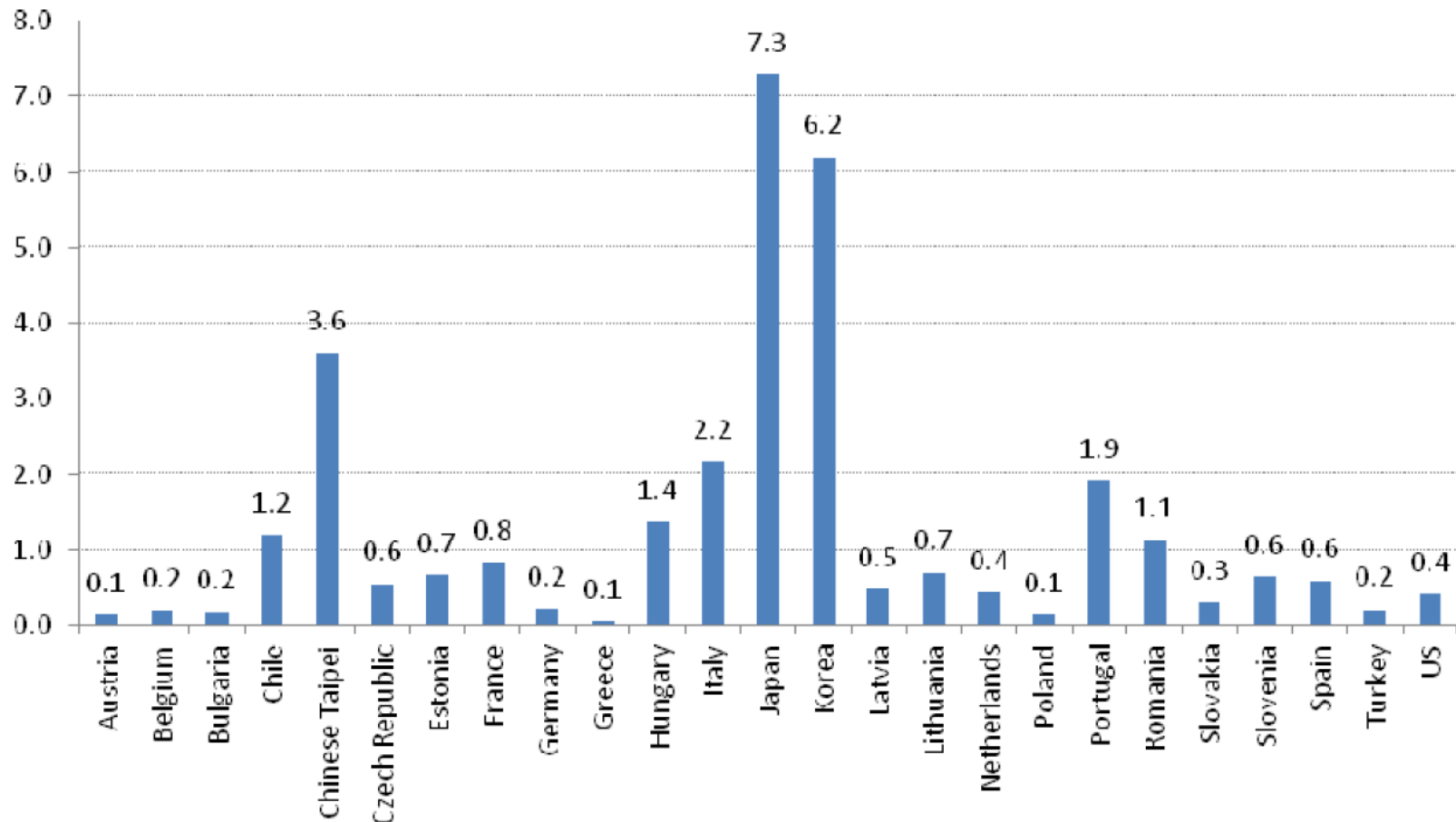
Source: Japan Federation of
Credit Guarantee Corporations (JFG)

4.2. CGC Basis Principle

- 1. Benefit SMEs striving to maintain, establish, and develop operations**
- 2. Help them to establish creditworthiness by evaluating their managerial capabilities, and facilitate funding by providing credit guarantee backed by a public institution**
- 3. Assist in reinforcing their bases of operations by responding flexibly to a diverse range of needs including consultation, analysis, and the provision of information**
- 4. By these actions, contribute to the prosperity of such enterprises and promote strong regional economic development**

Credit Guarantee Schemes worldwide: volume of outstanding guarantees in portfolio, 2011

As a percentage of GDP



Notes: 1. For European countries, members of the European Association of Mutual Guarantee Societies, including mutual, public and private-public schemes. 2. For Chile, Chinese Taipei, Japan and US the data refer to 2010.

Source: AECM (2012), Pombo (2010).

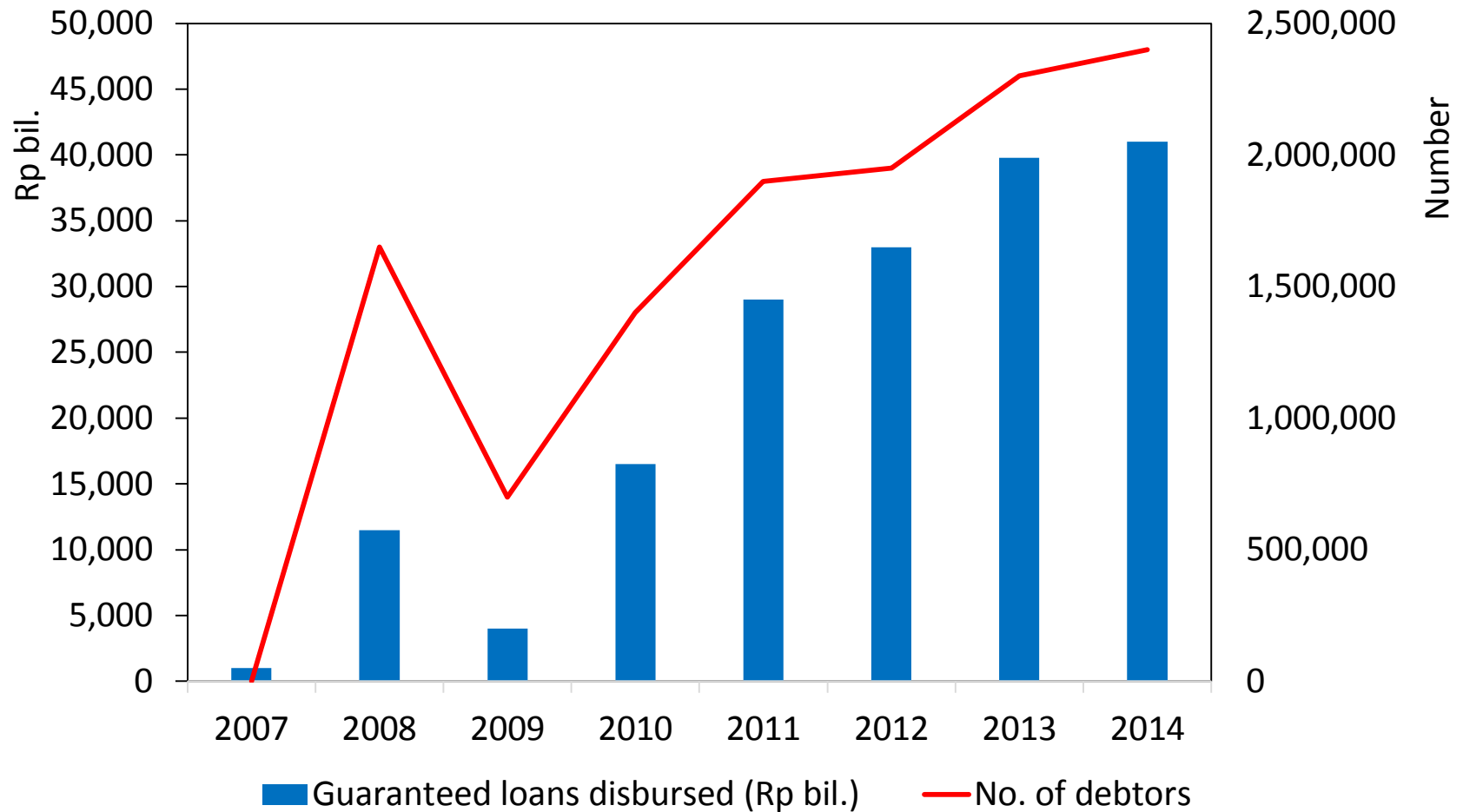


5.CGCs in Asia



Indonesia

Credit Guarantees—KUR (Indonesia)



KUR = Kredit Usaha Rakyat (People's Business Credit).

Source: Bank Indonesia.

Philippines

Small Business Corporation's Credit Guarantee Program (Philippines)

Item	2004	2005	2006	2007	2008	2009
Loan origination (in P)	287,970,000	228,740,870	316,061,318	212,555,000	166,500,000	82,500,000
Guaranteed amount* (in P)	221,964,500	168,696,109	214,955,744	131,346,500	107,810,172	58,300,000
Guarantee payments (in P)	2,420,793	664,869	6,216,703	11,607,602	10,448,183	...
Item	2010	2011	2012	2013	2014**	Total***
Loan origination (in P)	136,600,000	40,200,000	182,550,000	134,018,000	194,980,207	2,374,523,395
Guaranteed amount* (in P)	66,890,000	26,390,000	125,635,000	80,312,600	112,286,145	1,604,081,970
Guarantee payments (in P)	1,122,163	2,106,533	...	...	973,924	35,560,771

SME = small and medium-sized enterprise.

Note: Small Business Corporation is the largest provider of wholesale credit guarantee for MSME lending.

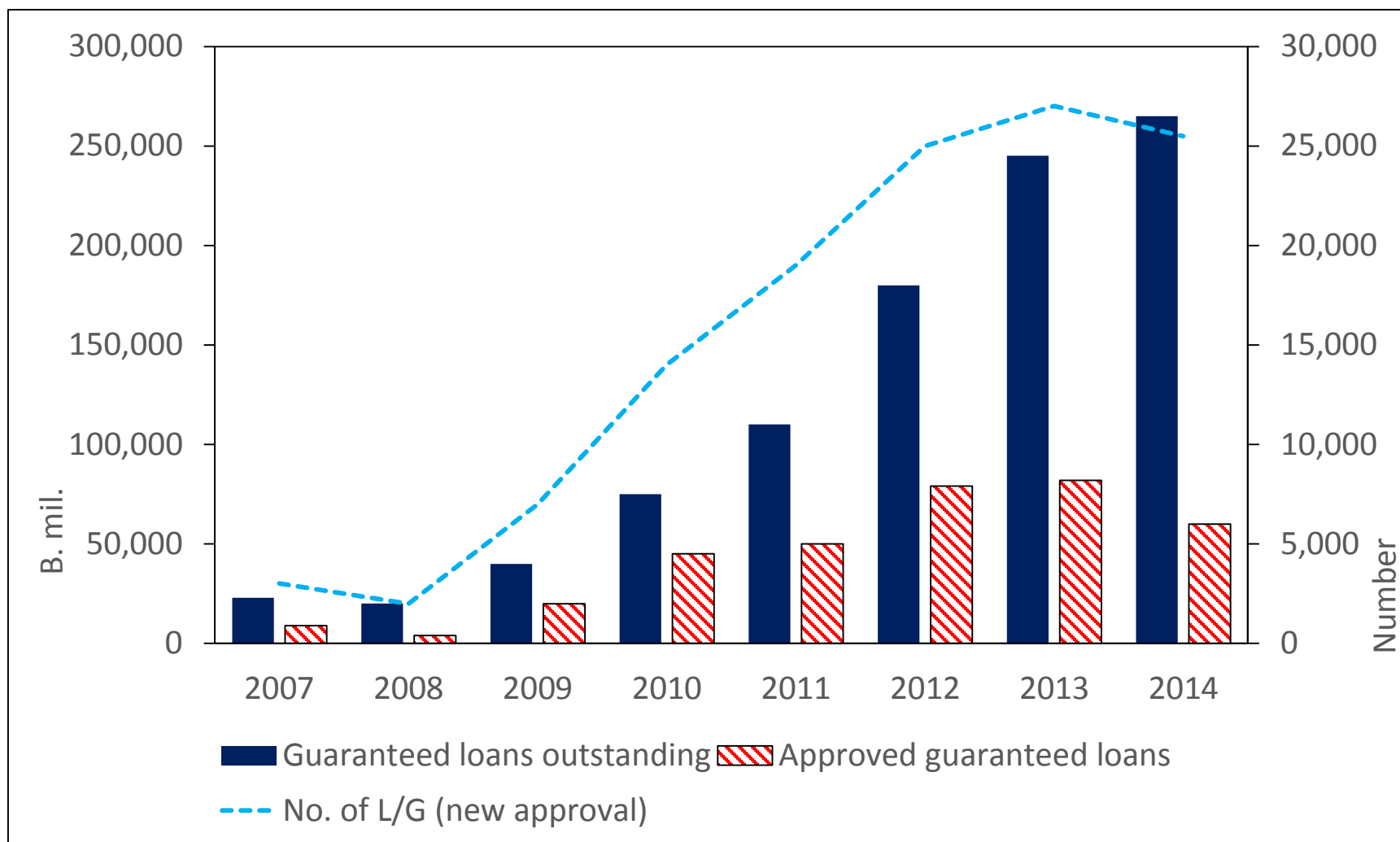
* Guaranteed amount is computed as approved credit line or loan amount x guarantee cover (%). Based on historical data, average guarantee cover is 70%, but there were special cases where the guarantee cover is below 70%, such as in 2010.

** January to June 2014.

*** Total amount from 2002 to June 2014. Source: Small Business Corporation. Source: ADB 2015

Thailand

Credit Guarantees—Thai Credit Guarantee Corporation



L/G = letter of guarantee.

Source: ADB (2015)

Japan

1. Following the introduction of credit guarantee scheme (CGS) in Japan in 1937, their use spread first throughout Europe and the Americas in the 1950s, and then to Africa, Asia and Oceania in the 1960s and 1970s.
2. At present, there are 51 CGCs, one for each prefecture and one in each of the cities of Nagoya, Yokohama, Kawasaki, and Gifu.
3. At the end of 2013, their total liabilities stood at approximately 30 trillion yen.

	2009	2010	2011	2012	2013
Number of SMEs	4,197,719	4,197,719	4,190,719	4,201,264	3,852,934
Number of companies using guarantees	1,591,726	1,573,067	1,543,847	1,502,972	1,458,434
Guarantee use rate	37.9%	37.5%	36.8%	35.8%	37.9%

* Number of SMEs taken from the "White Paper on Small and Medium Enterprises in Japan" compiled by the Small and Medium Enterprise Agency.

Source: Japan Federation of Credit Guarantee Corporations (JFG)

Eligible SMEs for the Credit Guarantee in Japan

CGCs define the scope of MSMEs eligible to receive credit guarantees as follows. MSMEs which either meet the requirements in terms of number of regular employees or paid-up capital as given in the table below are eligible for credit guarantees (excluding some special industries).

INDUSTRY	CAPITALIZATION	NUMBER OF EMPLOYEES
Manufacturing, etc.	Up to ¥300 million	300 or less
Wholesale	Up to ¥100 million	100 or less
Retail	Up to ¥ 50 million	50 or less
Services	Up to ¥ 50 million	100 or less
Health care, etc.	—	300 or less

Source: Japan Federation of Credit Guarantee Corporations (JFG)

Industries covered by the credit guarantee system are based on the industries designated by the enforcement regulation under the Small and Medium-sized Enterprise Credit Insurance Act. Agriculture, forestry, fisheries, financial industry are excluded.

Ceiling on Guarantee in Japan

	INDIVIDUALS / CORPORATIONS	COOPERATIVES, ETC.
General Guarantees	¥200 million	¥400 million
Guarantees without Collateral	¥ 80 million	¥ 80 million
Bond Guarantees	¥450 million	—

Source: Japan Federation of Credit Guarantee Corporations (JFG)

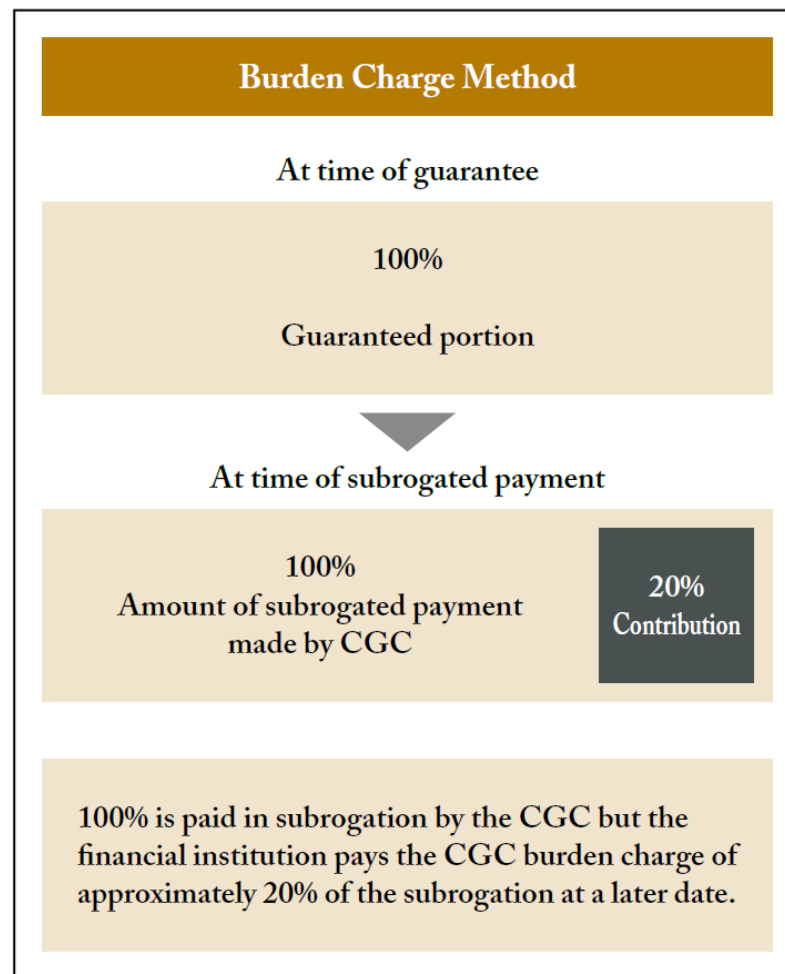
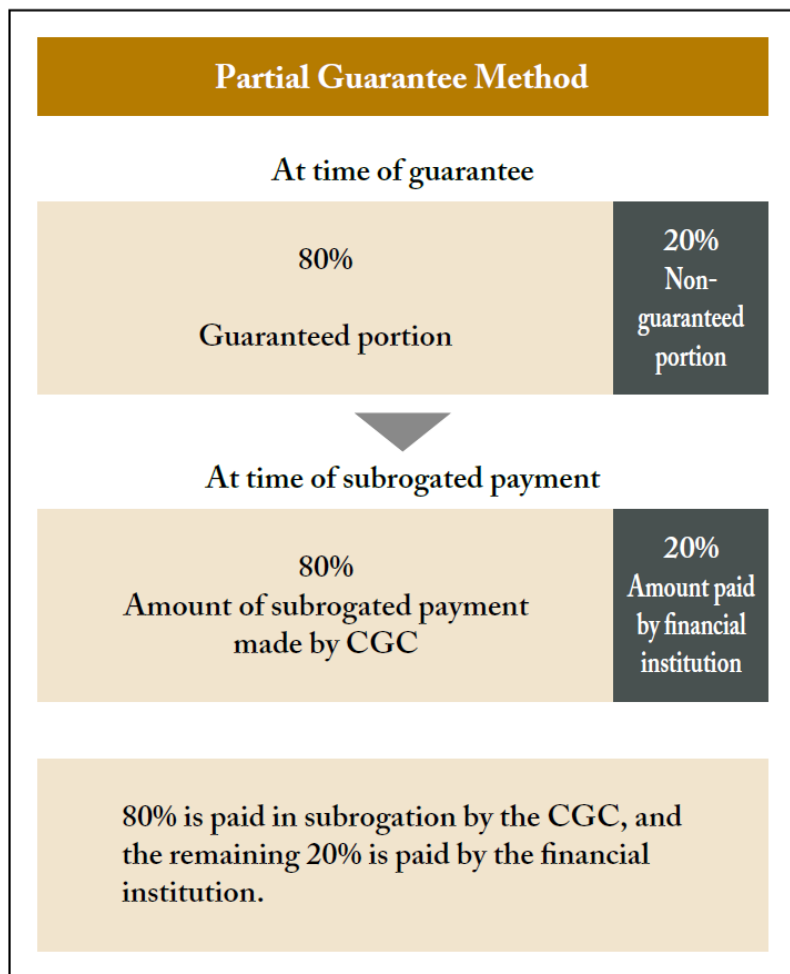
Credit Guarantee fee rate classification

Classification	1	2	3	4	5	6	7	8	9
Credit guarantee fee rate under Responsibility-sharing System	1.90	1.75	1.55	1.35	1.15	1.00	0.80	0.60	0.45
(Special Guarantee)	(1.62)	(1.49)	(1.32)	(1.15)	(0.98)	(0.85)	(0.68)	(0.51)	(0.39)
Credit Guarantee fee rate except Responsibility-sharing System	2.20	2.00	1.80	1.60	1.35	1.10	0.90	0.70	0.50
(Special Guarantee)	(1.87)	(1.70)	(1.53)	(1.36)	(1.15)	(0.94)	(0.77)	(0.60)	(0.43)

*1 "Special guarantees" mean revolving guarantee on discounting bill and other instruments, overdraft revolving guarantee and card loans of business operators.

*2 Credit guarantee fee rates applied to credit guarantee systems employing special insurance, or those to which the same credit guarantee fee rates are applied nationwide, etc. are determined separately.

Partial Guarantee



Source: Japan Federation of Credit Guarantee Corporations (JFG)

Research Questions

1. What is the optimal credit guarantee ratio for the CGC?
2. Should CGC provide same guarantee ratio for all lending institutions? Or should it be different based on the healthiness of the lending institutions?

6. Model

Policy Objective Function

$$U = w_1(L - L^*)^2 + w_2(\rho - \rho^*)^2$$

Loan Demand Function

$$L = l_0 - l_1 r_L + l_2 Y^e$$

Banks Profit Maximization

$$\text{Max. } \Pi = r_L(L) L - \rho(g, Y, P_L, P_S, M, Z) L - r_D D - C(L, D)$$

$$\text{Subject to: Banks's Balance sheet } (1 - \rho)L + \rho L = D + A$$

Amount of loan in equilibrium

$$L = \frac{l_1}{2} \left[\frac{l_0}{l_1} + \frac{l_2}{l_1} Y^e - \rho(g, Y, P_L, P_S, M, Z) - r_D - \rho'_L \right]$$

Optimal Credit Guarantee ratio: g

$$g = -\frac{1}{\alpha_1 \left(\frac{w_1 l_1^2}{4} + w_2 \right)} \cdot w_1 \frac{l_1^2}{4} \left(\frac{l_0}{l_1} + \frac{l_2}{l_1} y^e - r_D - \rho'_L \right) + \frac{l_1}{2\alpha_1} L^* - \frac{w_2}{\alpha_1} \rho^* - \frac{\alpha_2}{\alpha_1} Y - \frac{\alpha_3}{\alpha_1} P_L - \frac{\alpha_4}{\alpha_1} P_S + \frac{\alpha_5}{\alpha_1} M + \frac{\alpha_6}{\alpha_1} Z$$

Depends on:

- Actual SME loans
- The desired SME loans
- The desired default risk ratio of loans
- Fixed demand for loan
- Deposit interest rate
- Expected GDP
- The weight for stabilizing the SME loans
- The weight for reducing the non-performing loan ratio
- Marginal increase of non-performing loans by increase of additional loans
- Price of Land, Price of stock, GDP, money supply,
- Financial profile of banks

7. Empirical Survey

Variables Examined for Bank's Soundness

No.	Symbol	Definition
1	L-D	Total loans/total deposits
2	PR-L	Properties/total loans
3	(SD+LD)-D	(Saving deposits + long-term deposits)/total deposits
4	A-L	Total assets/total loans
5	SC-L	Securities/total loans
6	CA-D	Cash/total deposits
7	CBR-D	Accounts receivable from central bank/total deposits
8	OBR-D	Accounts receivable from other banks/total deposits

Note: Properties are land, buildings, and other hard assets owned by banks. Securities include shares of corporate stock or mutual funds, bonds issued by corporations or governmental agencies, limited partnership units, and various other formal investment instruments that are negotiable and fungible. Accounts receivable from the central banks includes reserve requirement (or cash reserve ratio) and other sums that are normally in the form of cash stored physically in a bank vault (vault cash) or deposits made with a central bank. Accounts receivable from other banks are sums loaned to other banks.

Source: Yoshino, Taghizadeh-Hesary, Nili (2015)

Statistical Analysis of banks' balance sheet data

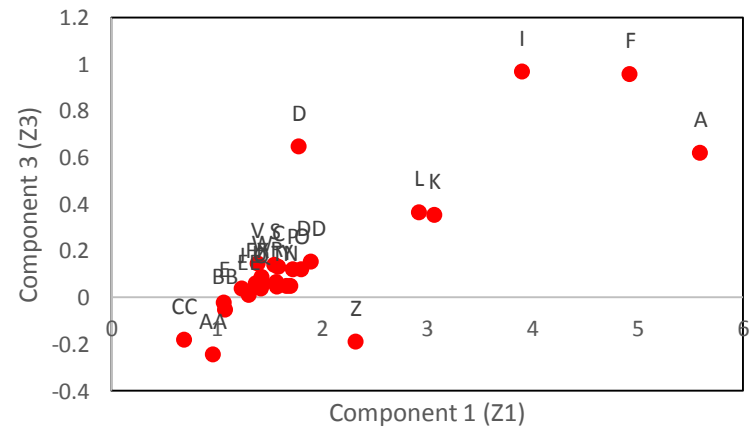
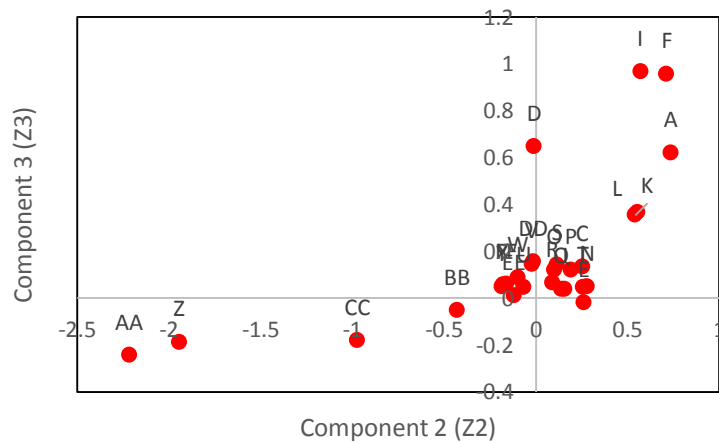
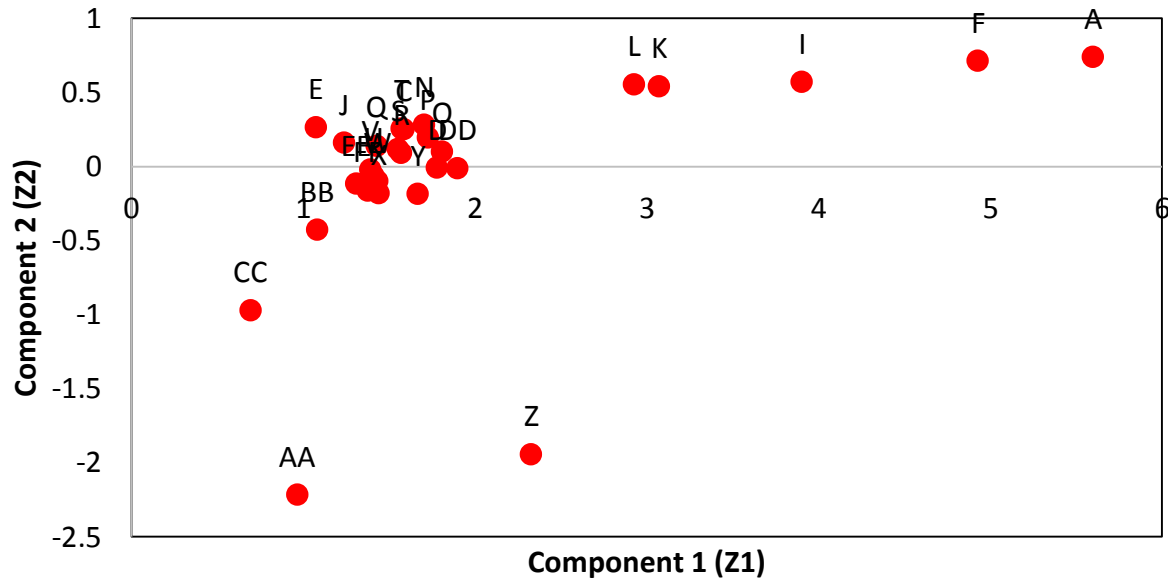
Factor Loadings of Financial Variables after Direct Oblimin Rotation

Variables (Financial Ratios of Banks)	Component		
	Z1	Z2	Z3
L-D	(0.238)	(0.912)	(0.143)
PR-L	0.042	0.190	0.780
(SD+LD)-D	(0.287)	0.819	(0.123)
A-L	0.987	0.083	0.130
SC-L	(0.096)	(0.140)	0.875
CA-D	0.379	(0.536)	0.039
CBR-D	0.954	(0.104)	(0.102)
OBR-D	0.981	(0.011)	(0.117)

() = negative.

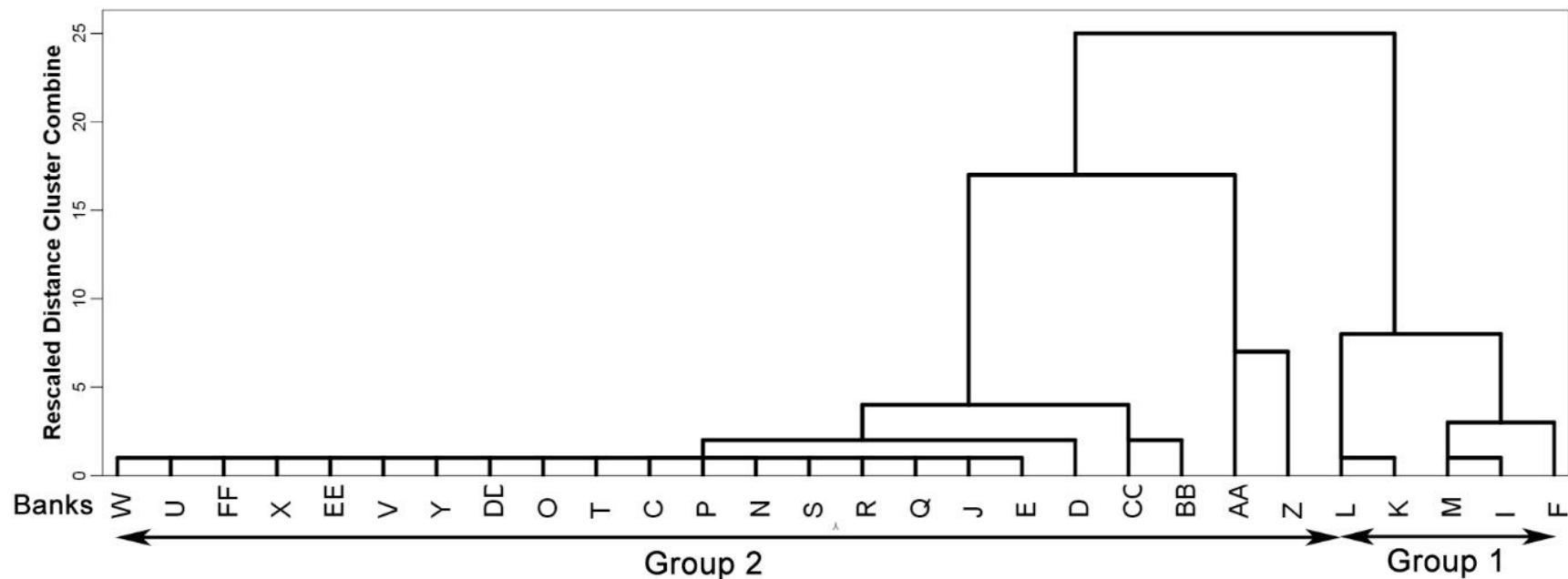
Note: The extraction method is principal component analysis. The rotation method is direct oblimin with Kaiser normalization.

Distribution of factors



Clustering

Dendrogram



Robustness Check for Three Sample Banks

Bank	Credit rank	Rank of L-D	Rank of PR-L	Rank of (SD+LD) -D	Rank of A-L	Rank of SC-L	Rank of CA-D	Rank of CBR-D	Rank of OBR-D
I	2	24	1	16	3	5	8	21	2
R	14	14	17	12	15	9	11	9	7
W	28	11	20	22	20	6	10	3	18

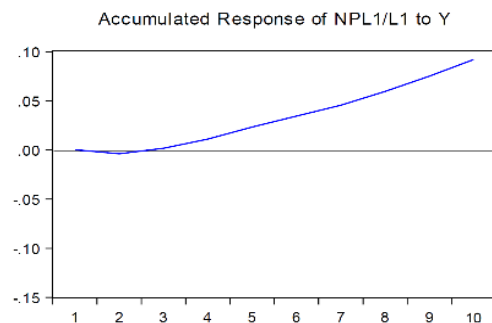
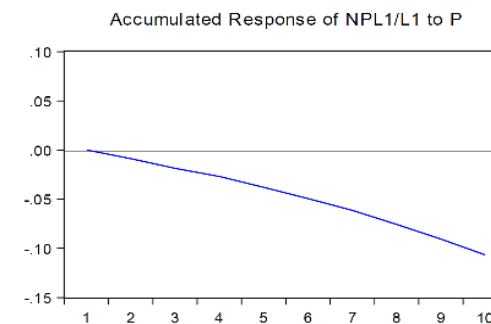
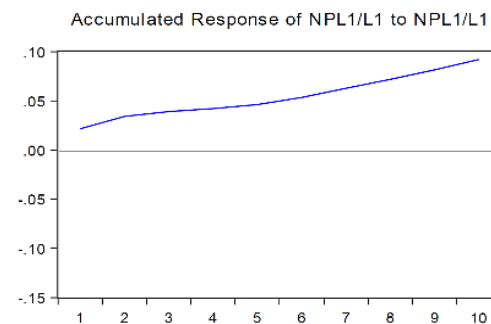
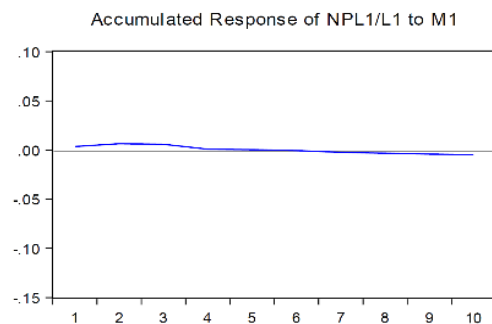
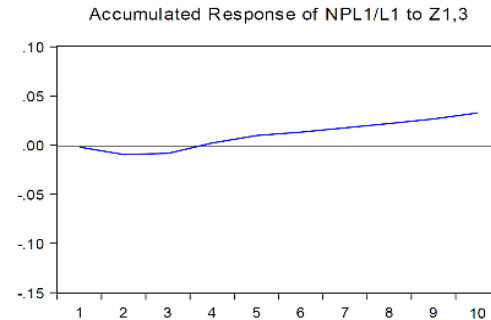
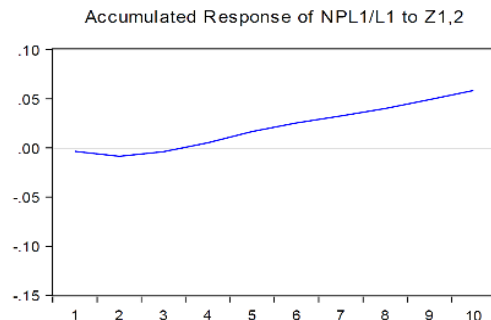
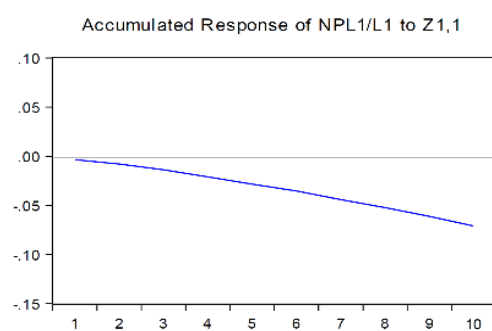
Data Analysis

- Stationarity test
- Co-integration analysis
- VECM

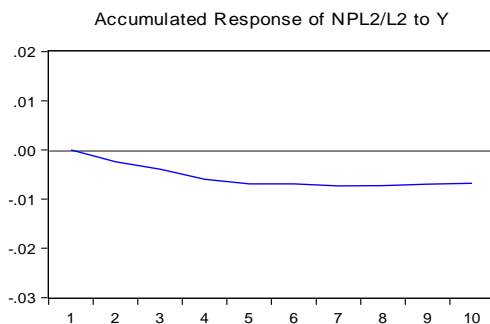
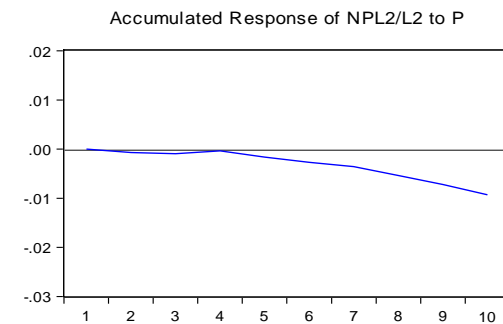
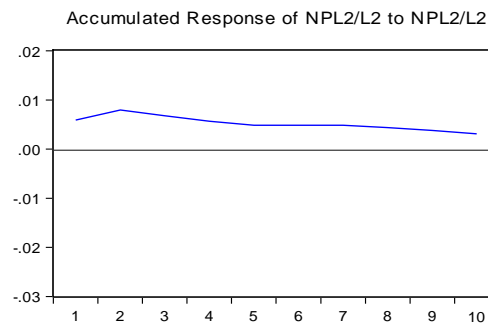
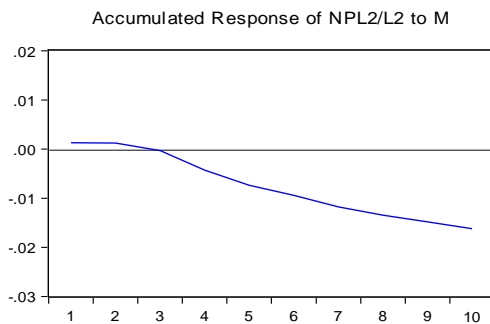
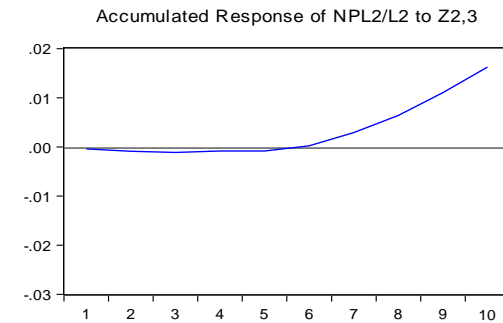
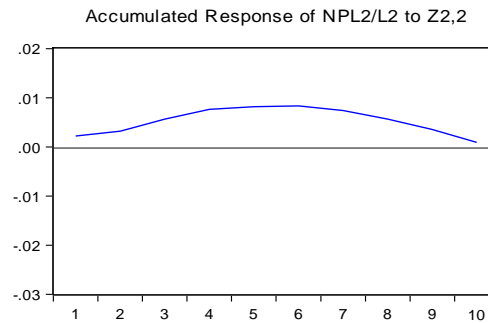
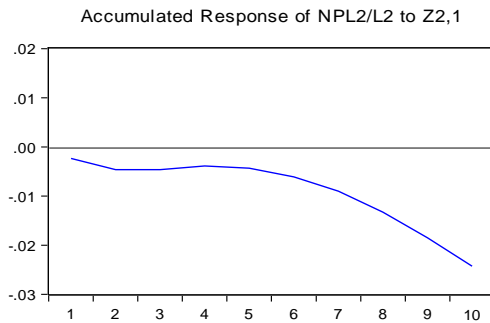
$$\begin{aligned}
 d(\rho_1) = & \Phi_1[Z_{1,1}(-1) - 47.45 \rho_1(-1) - 33.89 P(-1) + 1.82 Y(-1) + 0.34 \text{ trend} - 12.36] \\
 & + \Phi_2[Z_{1,2}(-1) - 8.83 \rho_1(-1) - 5.43 P(-1) + 0.75 Y(-1) + 0.05 \text{ trend} - 1.55] \\
 & + \Phi_3[Z_{1,3}(-1) - 23.10 \rho_1(-1) - 17.63 P(-1) + 6.89 Y(-1) + 0.24 \text{ trend} - 9.12] \\
 & + \Phi_4[M(-1) - 0.92 \rho_1(-1) - 2.17 P(-1) + 2.35 Y(-1) + 0.03 \text{ trend} - 1.59] \\
 & + \Phi_5 d[Z_{1,1}(-1)] + \Phi_6 d[Z_{1,2}(-1)] + \Phi_7 d[Z_{1,3}(-1)] + \Phi_8 d[M(-1)] + \Phi_9 d[\rho_1(-1)] \\
 & + \Phi_{10} d[P(-1)] + \Phi_{11} d[Y(-1)] + \Phi_{12}
 \end{aligned}$$

$$\begin{aligned}
 d(\rho_2) = & \Phi_{13}[Z_{2,1}(-1) + 0.67 Z_{2,2}(-1) - 3.90 Z_{2,3}(-1) + 0.03 M(-1) \\
 & - 2.04 \rho_2(-1) - 1.11 P(-1) - 0.04 Y(-1) + 0.008 \text{ trend} - 0.97] \\
 & + \Phi_{14} d[Z_{2,1}(-1)] + \Phi_{15} d[Z_{2,2}(-1)] + \Phi_{16} d[Z_{2,3}(-1)] + \Phi_{17} d[M(-1)] \\
 & + \Phi_{18} d[\rho_2(-1)] + \Phi_{19} d[P(-1)] + \Phi_{20} d[Y(-1)] + \Phi_{21}
 \end{aligned}$$

Impulse Response Analysis: Group 1 of banks



Impulse Response Analysis: Group 2 of banks

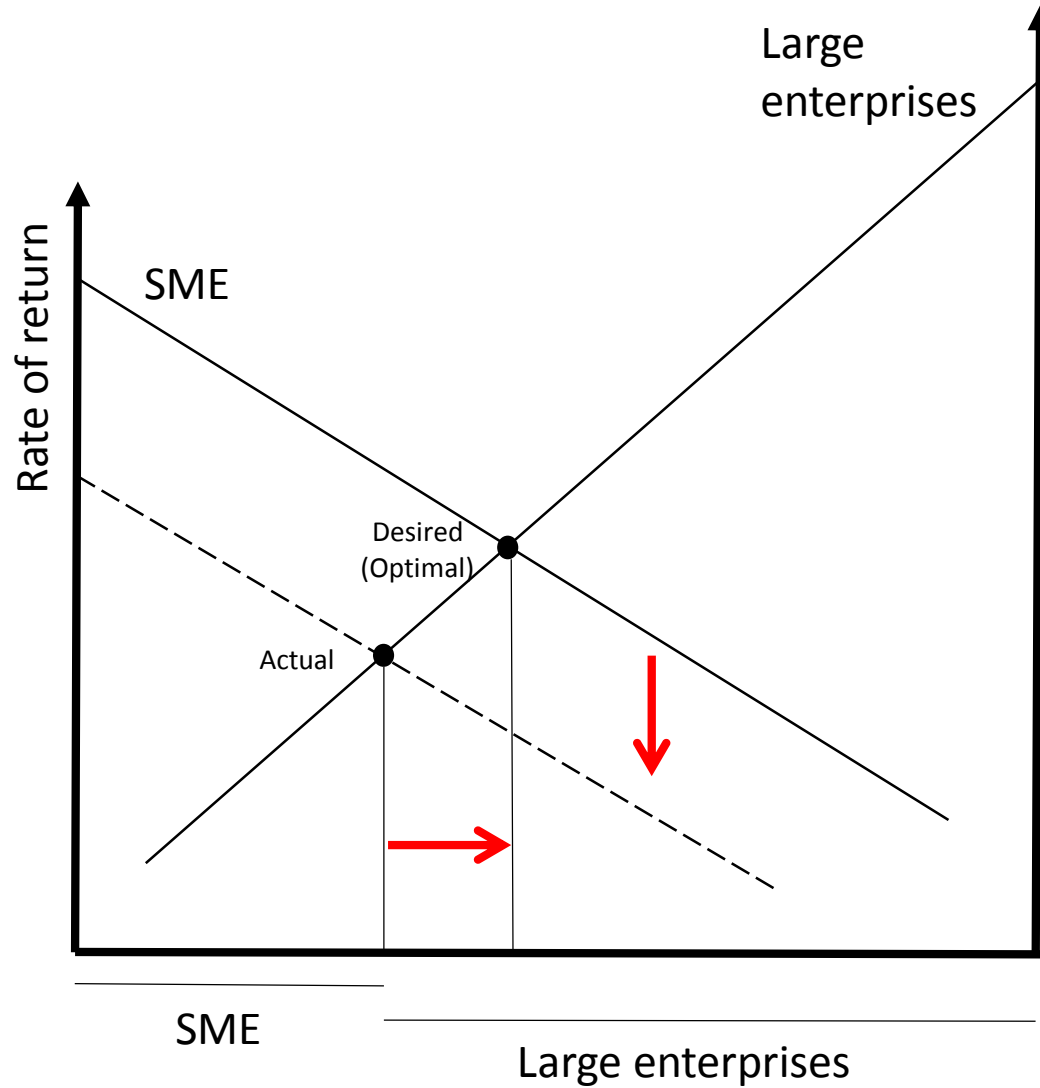


Calculated Optimal credit Guarantee ratios:

Group 1 of banks: 0.775

Group 2 of banks: 0.683

Role of Credit Guarantee



Reference:

1. Yoshino, N. (2012). Global Imbalances and the Development of Capital Flows among Asian Countries. *OECD Journal: Financial Market Trends*. Vol. 2012/1.
2. Yoshino, N. (2013). The Background of Hometown Investment Trust Funds. In N. Yoshino and S. Kaji, eds. *Hometown Investment Trust Funds: A Stable Way to Supply Risk Capital*. Tokyo: Springer.
3. Yoshino, N. and F. Taghizadeh-Hesary (2014). An Analysis of Challenges Faced by Japan's Economy and Abenomics. *The Japanese Political Economy* 40: 1–26. DOI: 10.1080/2329194X.2014.998591
4. Yoshino, N. and F. Taghizadeh-Hesary (2014). *Analytical Framework on Credit Risks for Financing SMEs in Asia*. *Asia-Pacific Development Journal*. United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP). 21(2): 1-21.
5. Yoshino, N., Taghizadeh-Hesary, F., Nili, F. (2015), 'Estimating Dual Deposit Insurance Premium Rates and Forecasting Non-performing Loans: Two New Models'. ADBI Working Paper 510. Asian Development Bank Institute: Tokyo
6. Kuwahara, S., N. Yoshino, M. Sagara, and F. Taghizadeh-Hesary. (2015). Role of the Credit Risk Database in Developing SMEs in Japan: Lessons for the Rest of Asia. ADBI Working Paper 547. Tokyo: Asian Development Bank Institute.
7. Yoshino, N. and F. Taghizadeh-Hesary. (2015). Analysis of Credit Risk for Small and Medium-Sized Enterprises: Evidence from Asia. *Asian Development Review (ADR)*. Vol. 32 No. 2.: 18-37, MIT Press.



**Thank you for
your attention!**

nyoshino@adbi.org
farhadth@gmail.com