

Optimal Credit Guarantee Rate and Big Data Analysis of MSMEs

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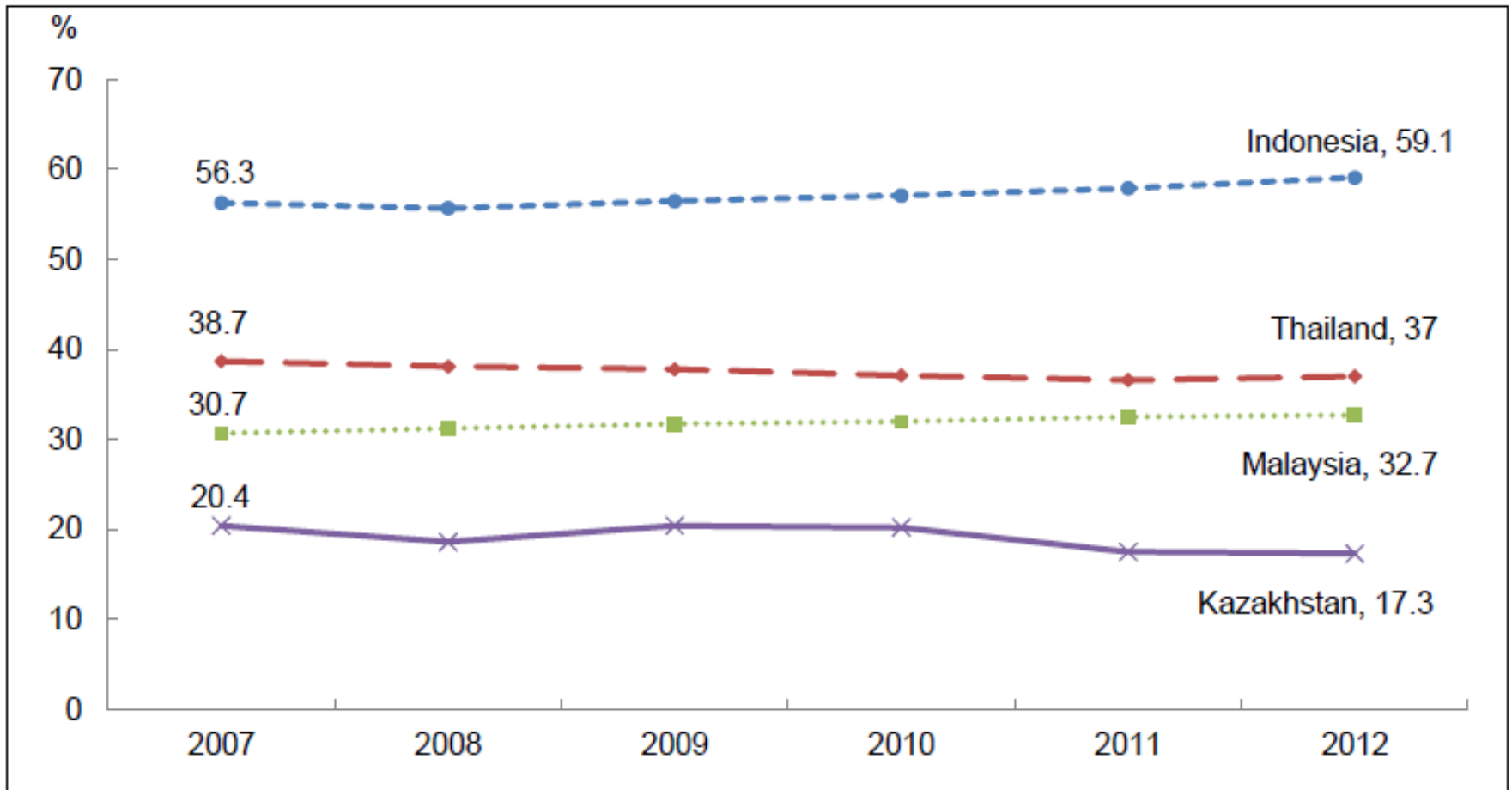
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Financing for MSMEs

- 1, Bank Loans
- 2, Government Loans to MSME
- 3, Special banks for MSME
(Credit cooperatives)
- 4, Credit Guarantee
- 5, Money lenders (Black market)
- 6, MSME data

Contribution of SMEs to GDP

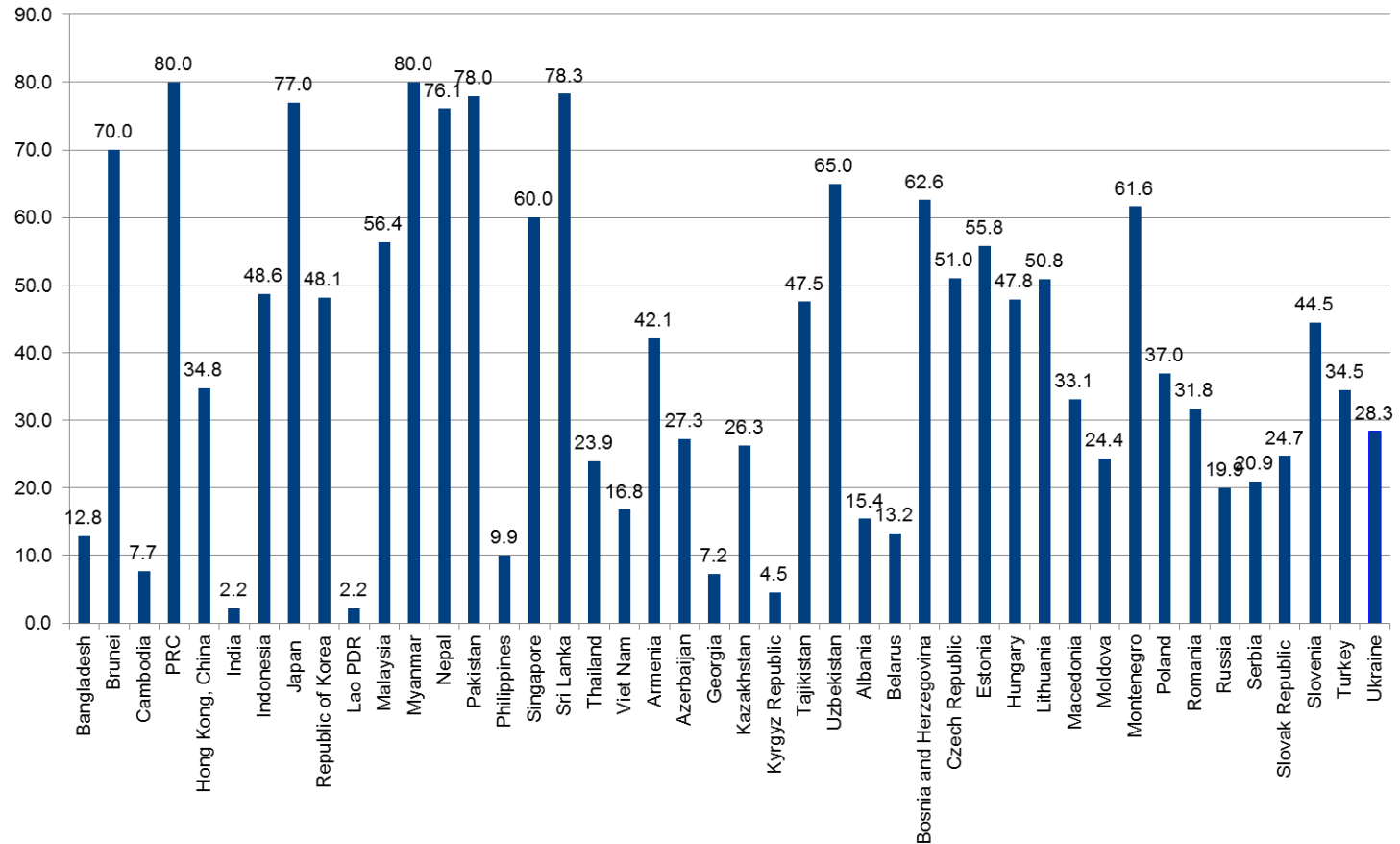


Source: ADB (2014)

03/14/2017

Yoshino - Taghizadeh

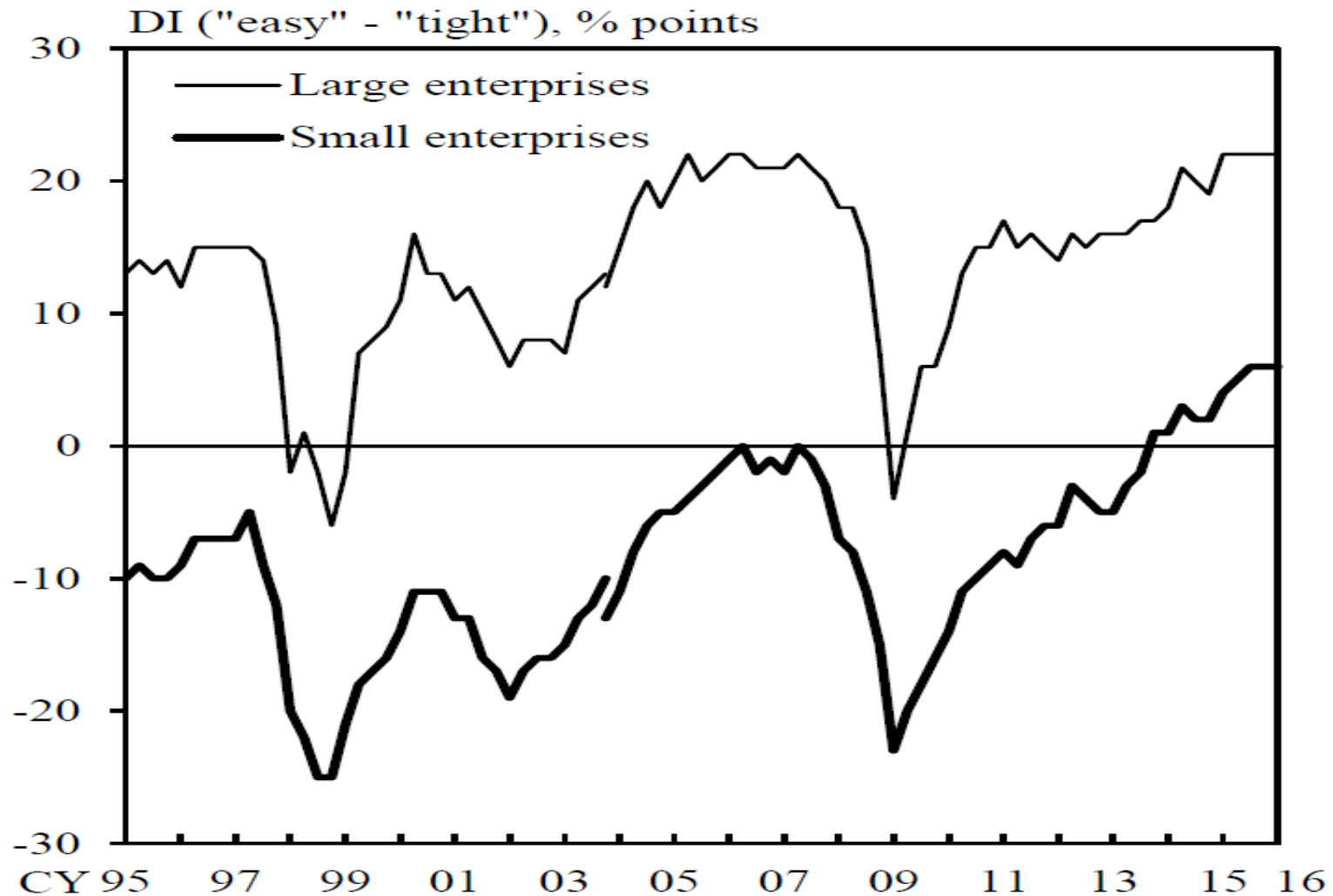
SMEs Share in Employment (%)

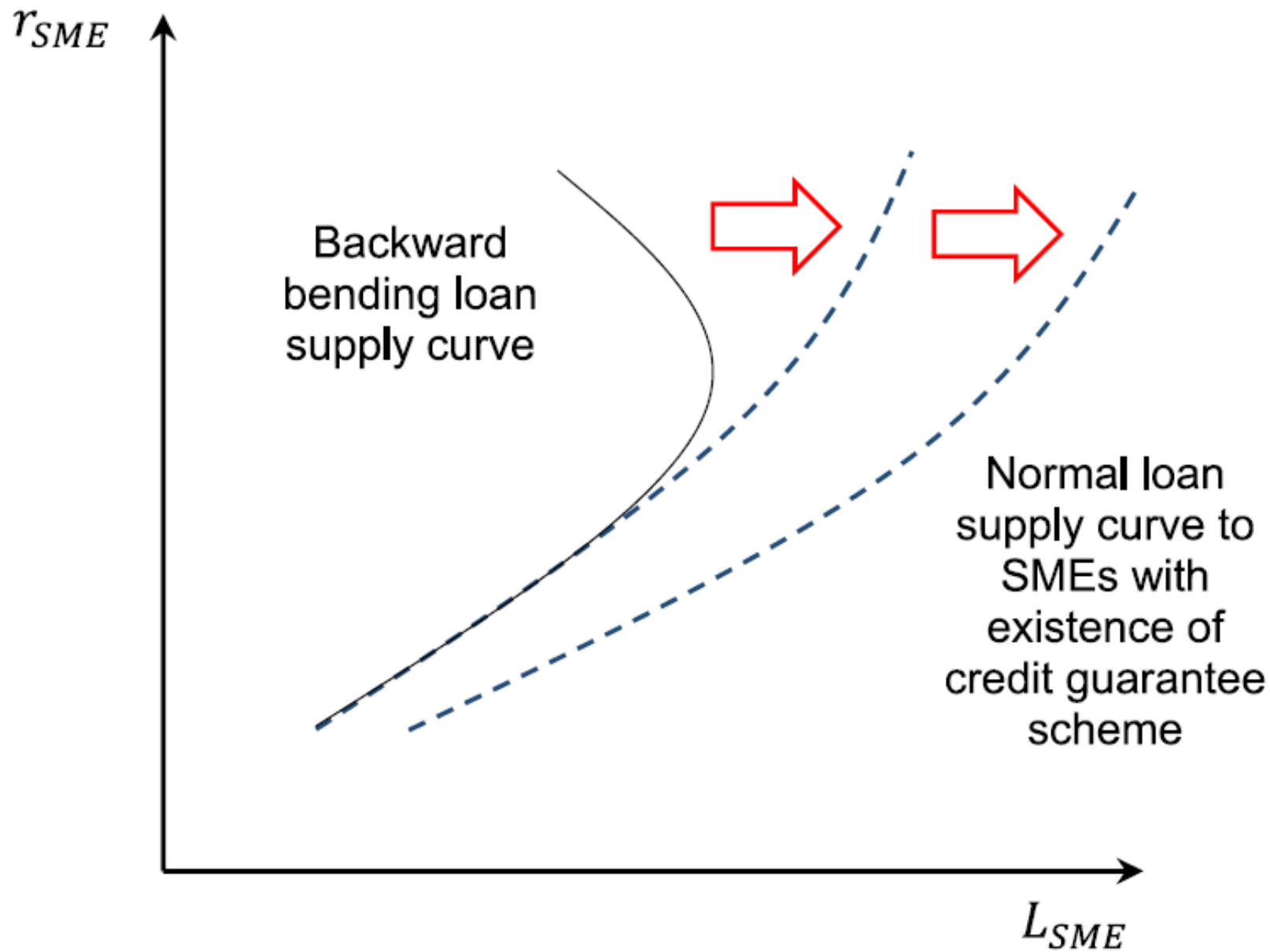


Access to Finance by SMEs and Large Firms in Japan

(2) Financial Position

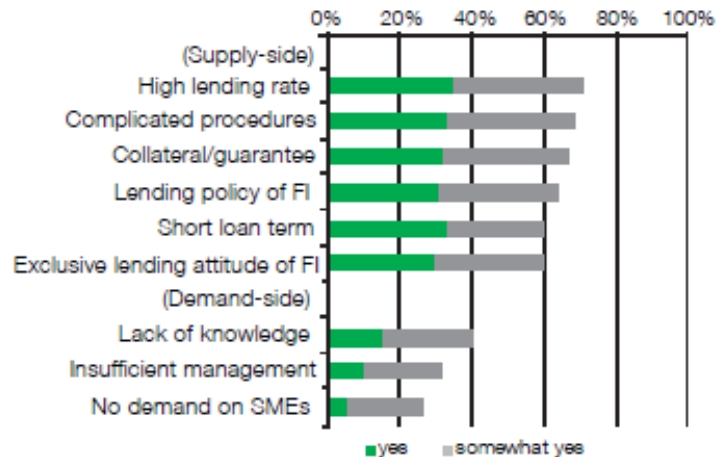
(a) *Tankan*



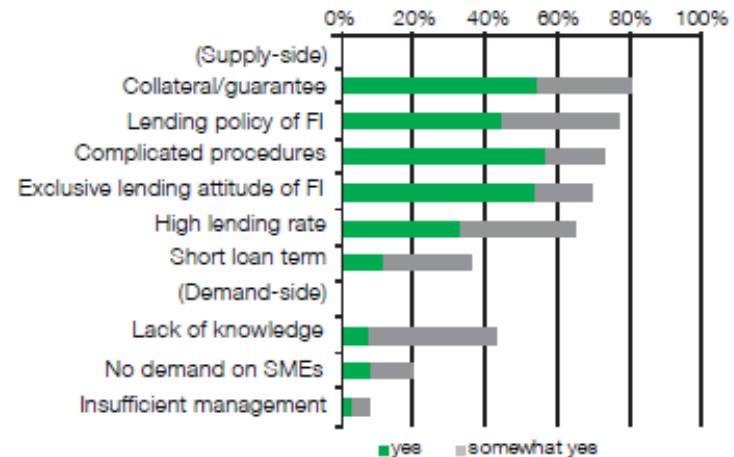


Barriers for SMEs in Accessing Financial Institutions, *Collateral, Higher rate*

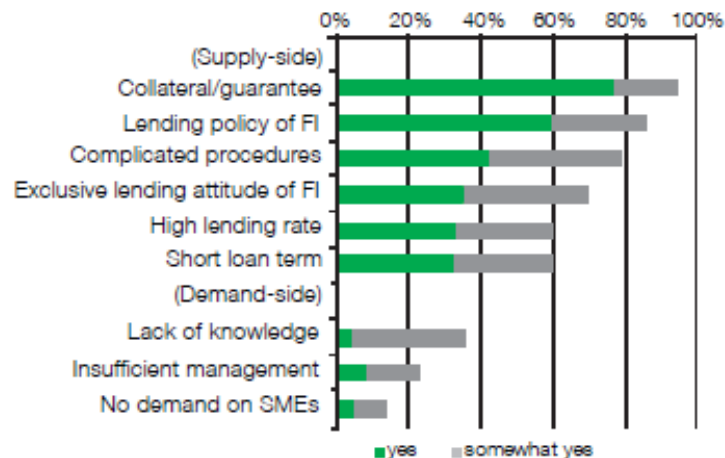
A. People's Republic of China



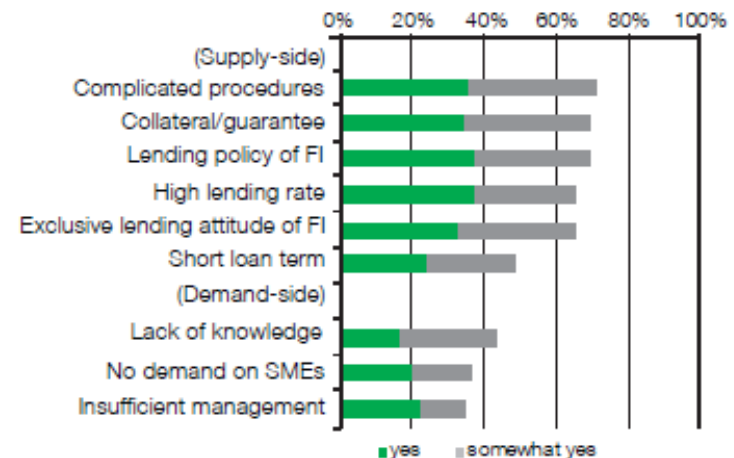
B. India



C. Republic of Korea

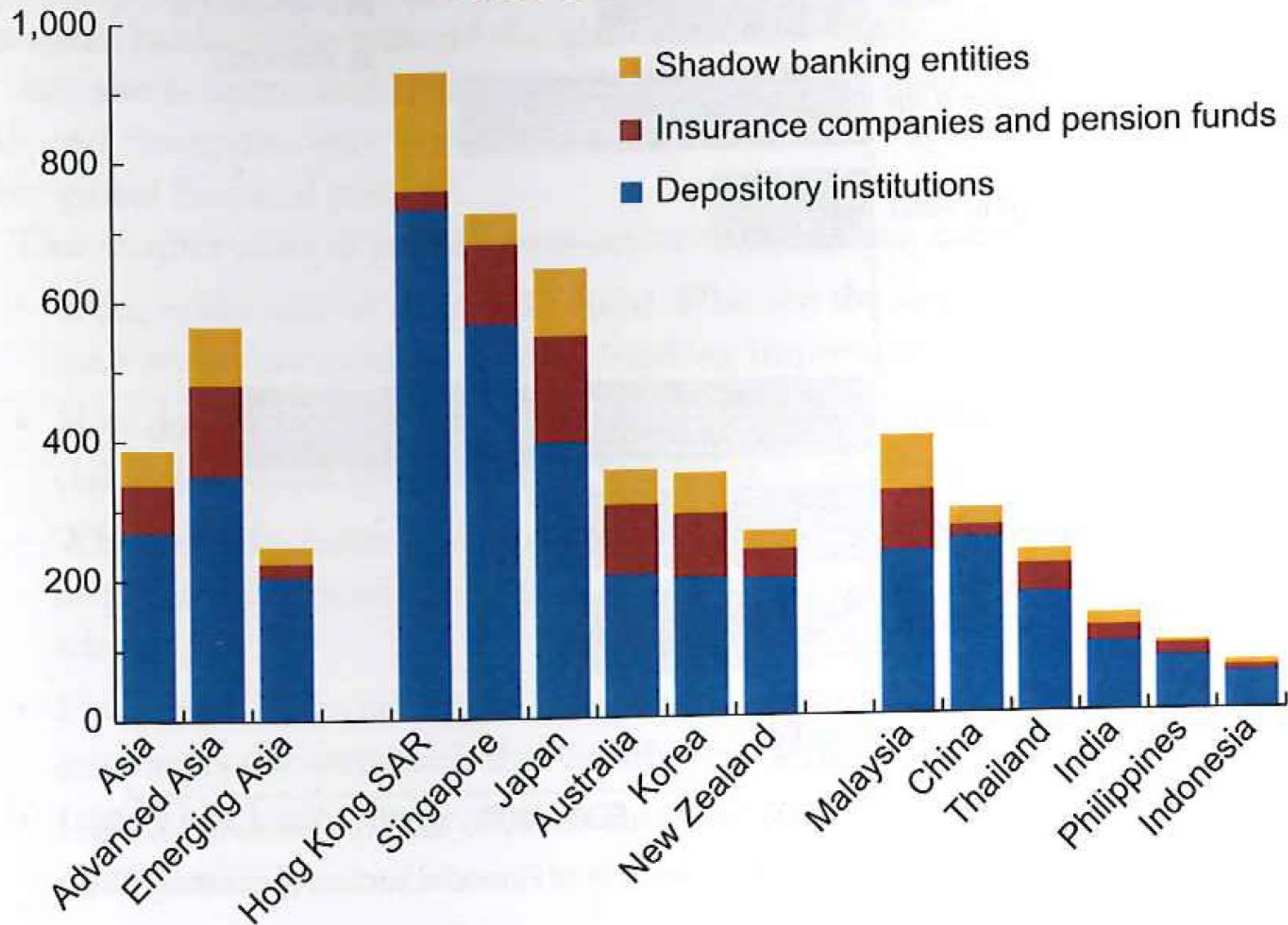


D. Malaysia



Source: ADB–OECD study on enhancing financial accessibility for SMEs: Lessons from recent crises. Mandaluyong City, Philippines: Asian Development Bank, 2013

1. Assets of Financial Institutions



Small and Medium Sized Enterprise (SME)

Venture business

Toyota, Honda, **SevenEleven**, Nintendo

Mr. HONDA worked at SME as a repairman.

Seven Eleven: President Ito's story

How to finance start-up business ?

→ **Hometown Investment Trust Funds**

Figure 5. Credit Risk Database of Small and Medium-Sized Enterprises

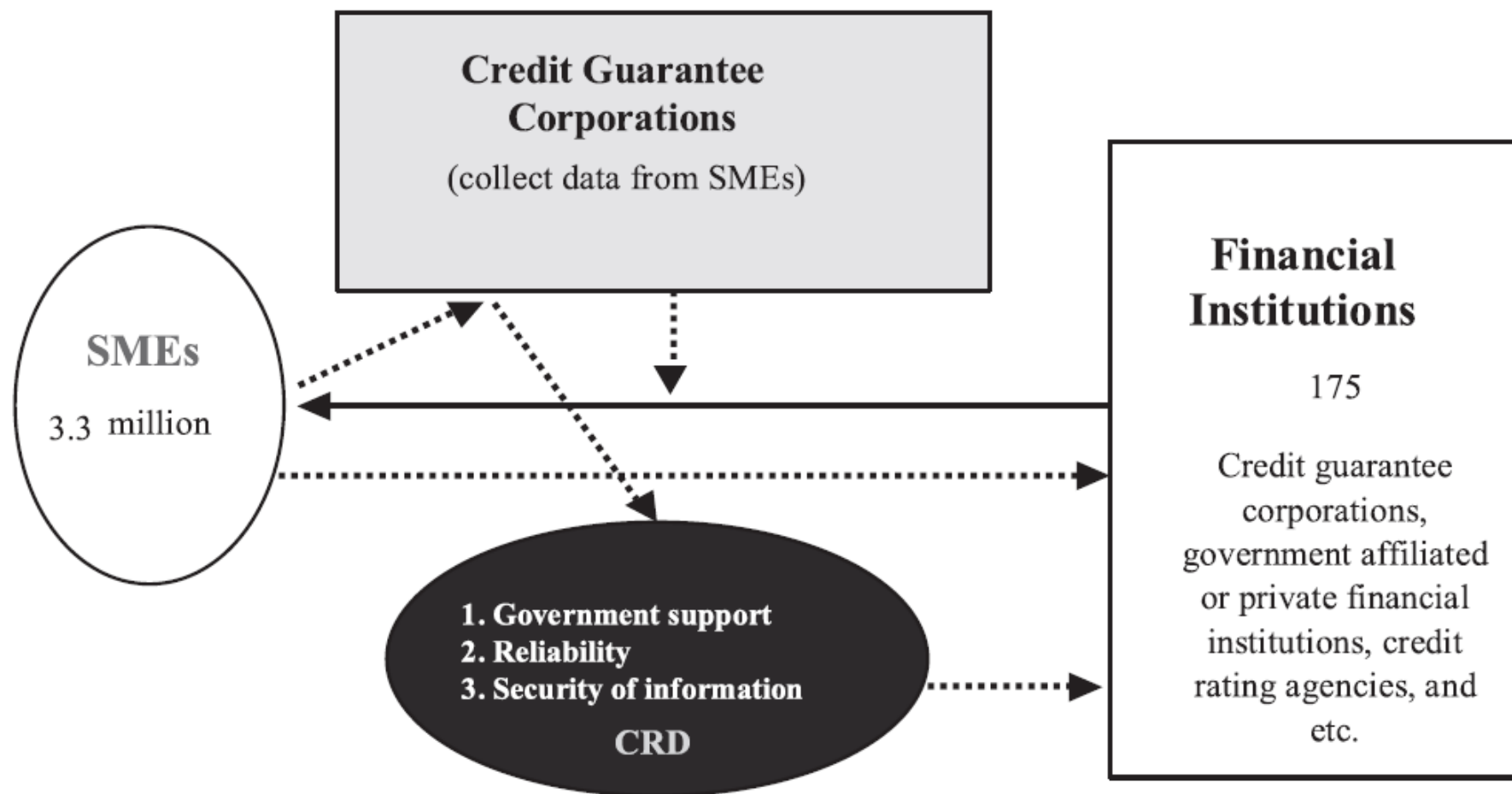


Table 11.1: Membership Composition

Category	Number of Members
Credit guarantee corporations	51
Government-affiliated financial institutions	3
Private financial institutions	114
Credit-rating agencies, etc.	7
Government institutions	5
Total	180

Note: Numbers are as of 1 April 2016.

Source: Credit Risk Database. www.crd-office.net/CRD/en/index.html



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Full length article

Optimal credit guarantee ratio for small and medium-sized enterprises' financing: Evidence from Asia

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3.1. Policy objective function

The equation below shows the policy

$$U = w_1 (L - L^*)^2 + w_2 (\rho - \rho^*)^2$$
$$\frac{\partial U}{\partial g} = 2w_1 (L - L^*) \cdot \frac{\partial L}{\partial g} + 2w_2 (\rho - \rho^*) \cdot \frac{\partial \rho}{\partial g}$$

which is equal to:

$$= 2w_1 (L - L^*) \cdot \left(\frac{-l_1}{2} \cdot \frac{\partial \rho}{\partial g} \right) + 2w_2 (\rho - \rho^*) \cdot \frac{\partial \rho}{\partial g}$$

In Eq. (2) we showed that the profit of the bank is a function of the default risk, the lower the profit for the bank (Yoshida, 2013) capture the factors that affect this ratio:

$$\rho = f(g, Y, P_L, P_S, M, Z)$$

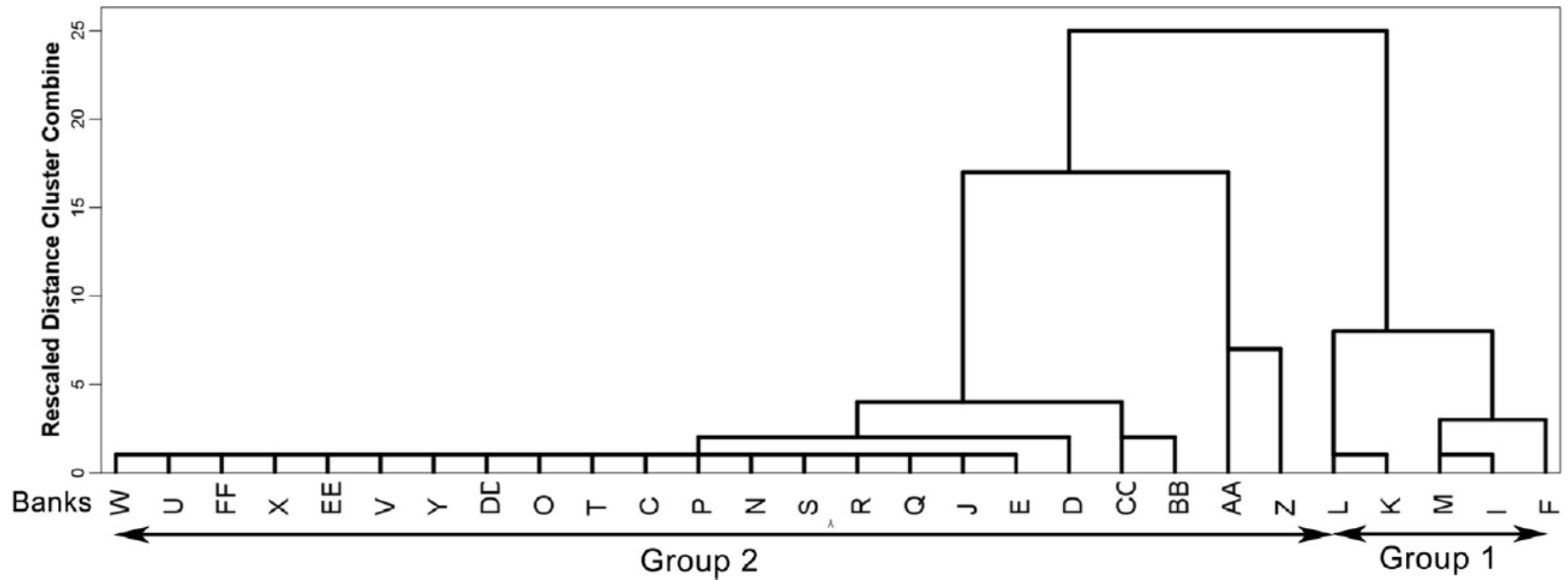


Fig. 4. Dendrogram.

Source: Authors' compilation.

Calculated Optimal Credit Guarantee ratios

the optimal credit guarantee ratio in our model depends on three groups of factors:

1. **macroeconomic variables** **Group 1 of banks: 0.775**
2. **government policies,** **Group 2 of banks: 0.683**
3. **banking profile.**

These two groups consist of various variables including: price of land, price of stock, gross domestic product (GDP), money supply, actual SME loans, fixed demand for loans, deposit interest rate, expected GDP, marginal increase of nonperforming loans by increase of additional loans, desired SME loans, desired default risk ratio of loan, weight for stabilizing the SME loans, weight for reducing the nonperforming loan ratio, and financial profile of banks.

Examined Variable

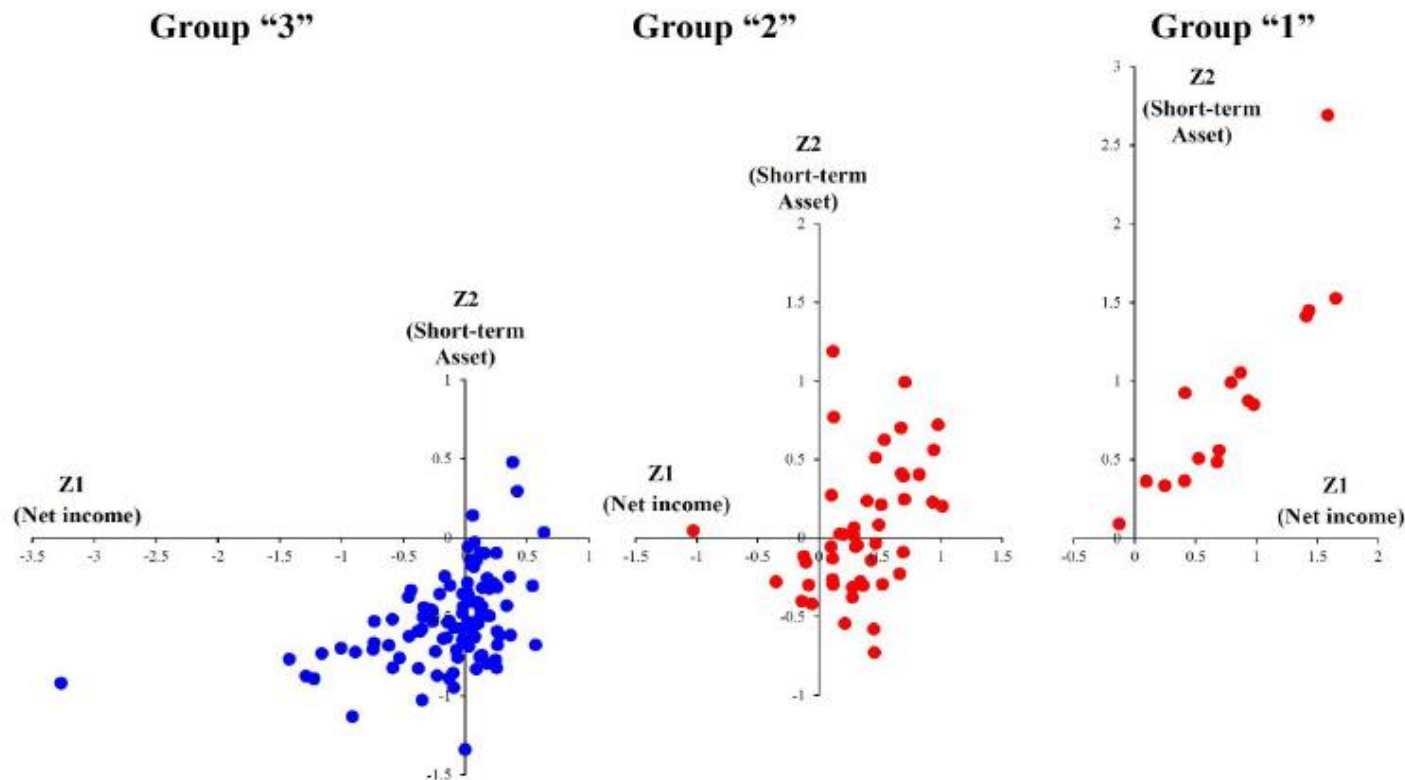
No.	Symbol	Definition	Category
1	Equity_TL	Equity (book value)/total liabilities	Leverage
2	TL_Tassets	Total liabilities/total assets	
3	Cash_Tassets	Cash/total assets	Liquidity
4	WoC_Tassets	Working capital/total assets	
5	Cash_Sales	Cash/net sales	Profitability
6	EBIT_Sales	Ebit/sales	
7	Rinc_Tassets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

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

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.

Robustness check of the method

$$Y = c + \alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_3 Z_3 + u$$

Variable	Coefficient	Std. Error	Z-Statistic	Prob.	
C	1.14	0.09	13.06**	0	
Z1	1.00	0.16	6.31**	0	
Z2	-2.17	0.14	-15.40**	0	
Z3	-1.02	0.21	-4.75**	0	
McFadden R-squared: 0.76					

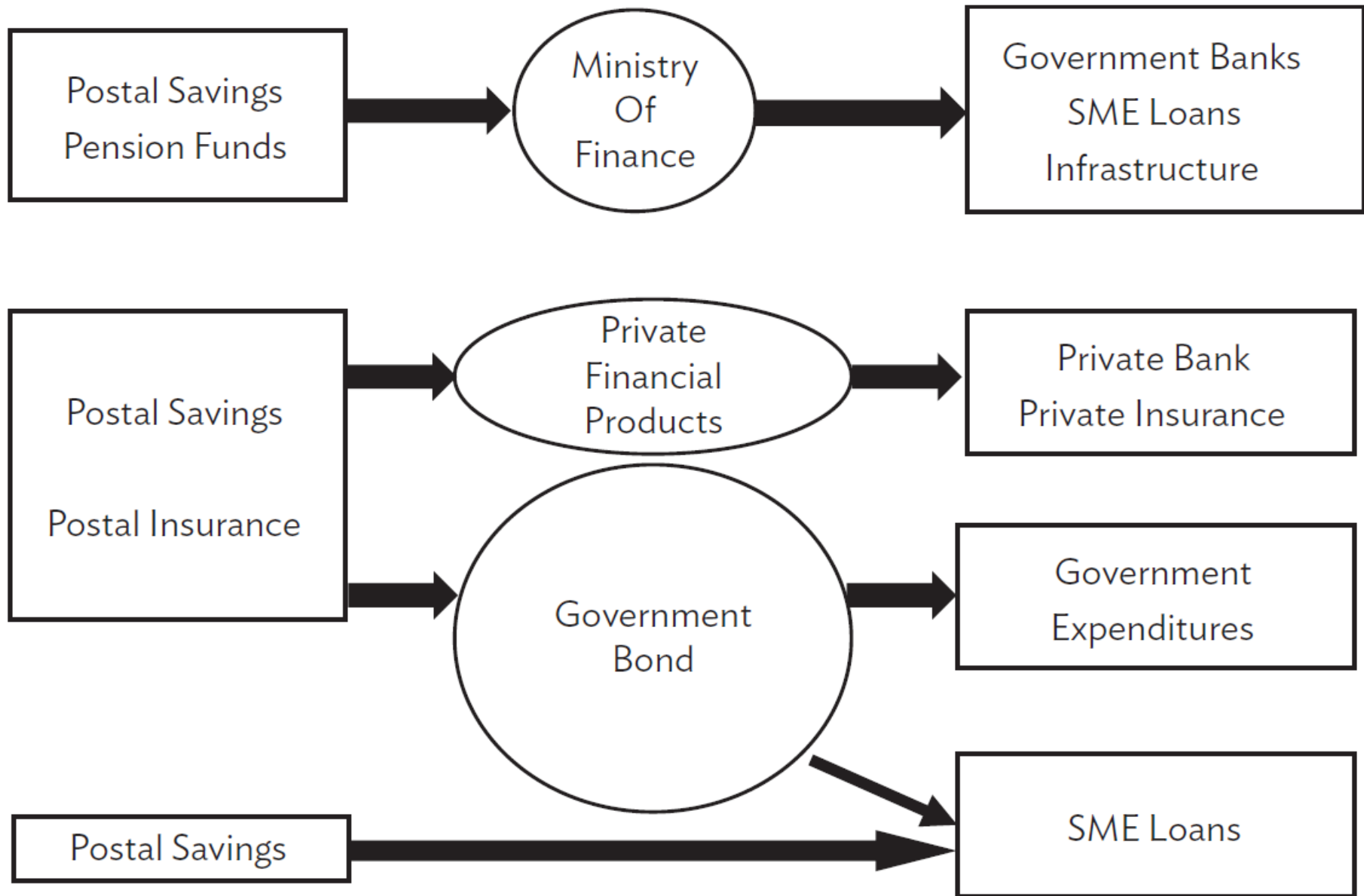
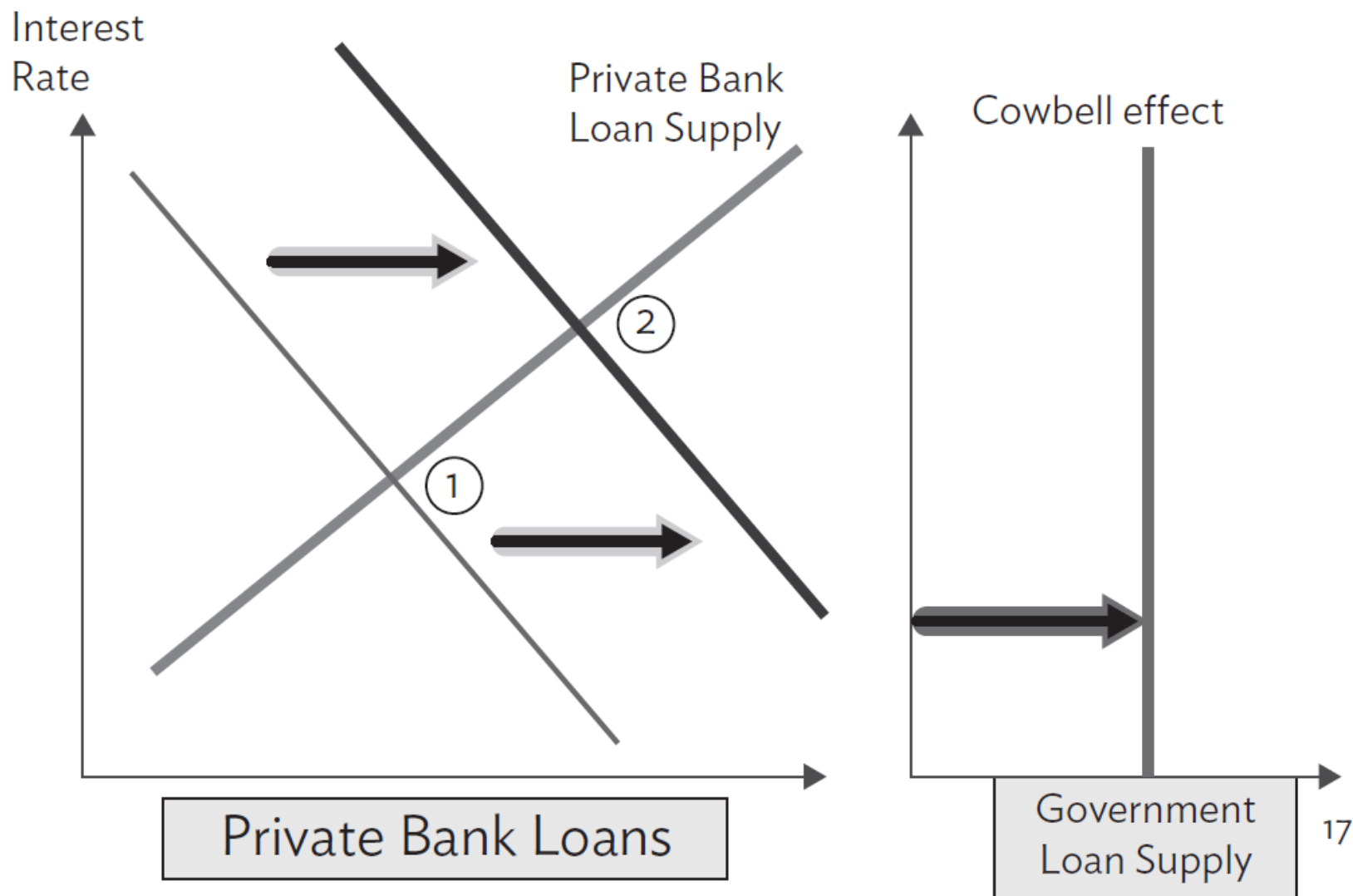


Figure 8.4 The Crowding-In Effect



Possible Solutions

Start up businesses, farmers

Hometown Investment Trust Funds : Springer

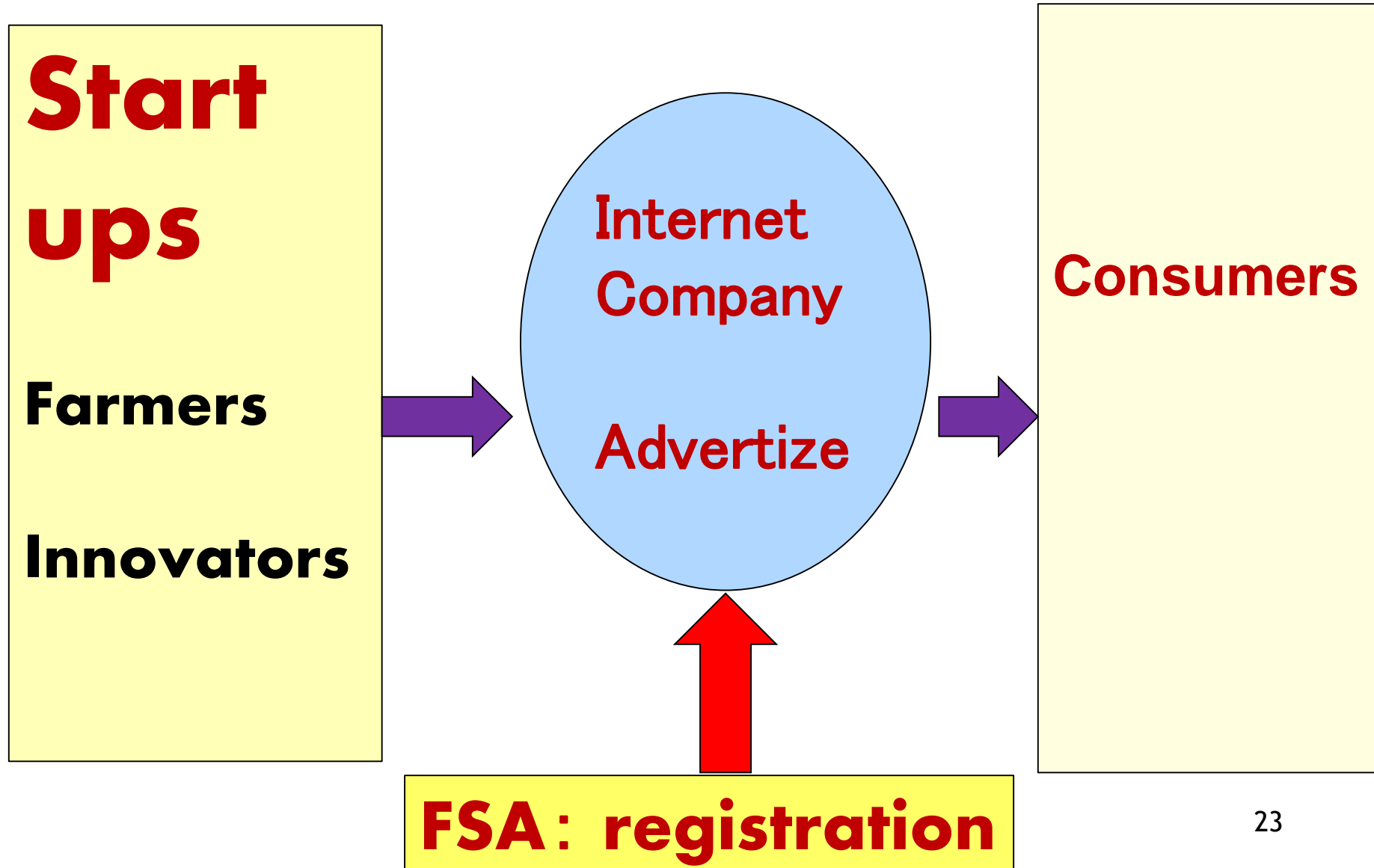
A Stable Way to Supply Risk Capital

Yoshino, Naoyuki; Kaji Sahoko (Eds.)
2013,

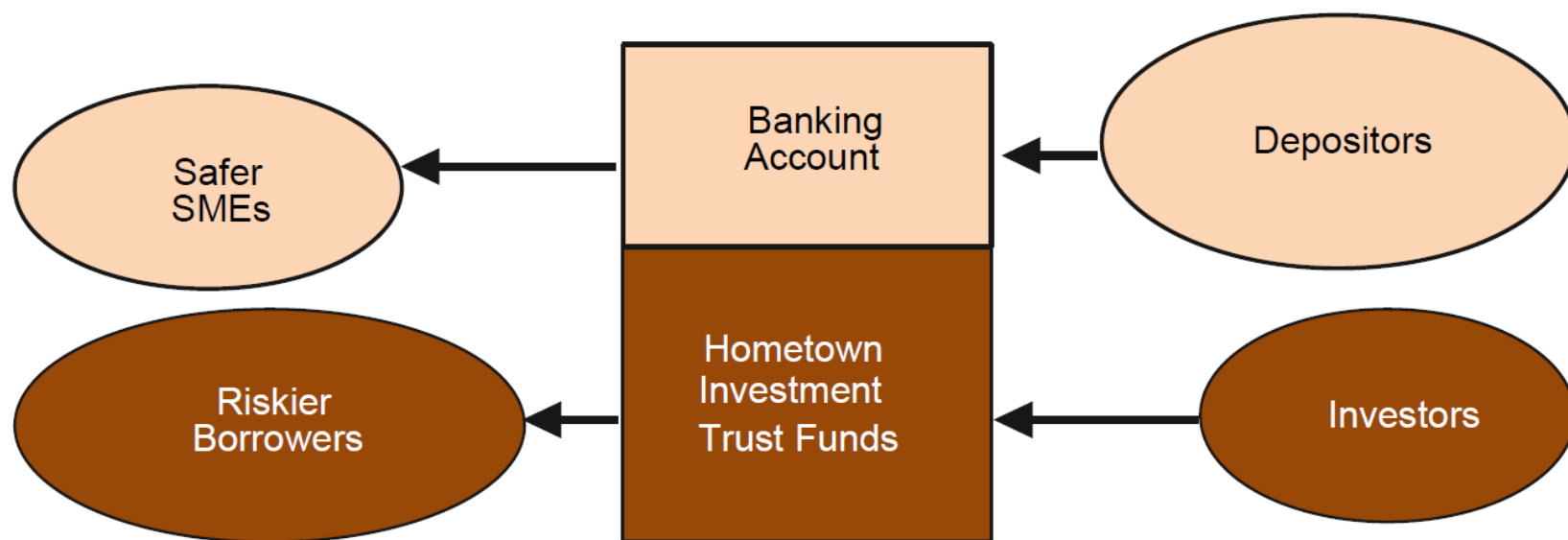
Japan, Cambodia
Vietnam, Peru, Mongolia

Access to Digital Technology
(1) Sales Promotion by Internet
(2) Invest into start-ups

Internet On-line trade



Hometown investment trust funds a new way to finance for Wind power generators, solar power panels etc.



SME =small and medium-sized enterprise.

Source: Yoshino and Taghizadeh-Hesary (2014).





Agricultural Funds

Beans and Wine



Dec 11 2013 , Tehran - I
IRAN



-Financial Access for All-

TRUST is important

- 1, Regular meetings with producers (every quarter)**
- 2, Look for good products and advertise by internet**
- 3, Give advise to innovators**
- 4, Order the products though internet**
- 5, Payment and Delivery**
- 6, Reputation**
- 7, Trust of community, Trust by customers**

Financial Education for SMEs

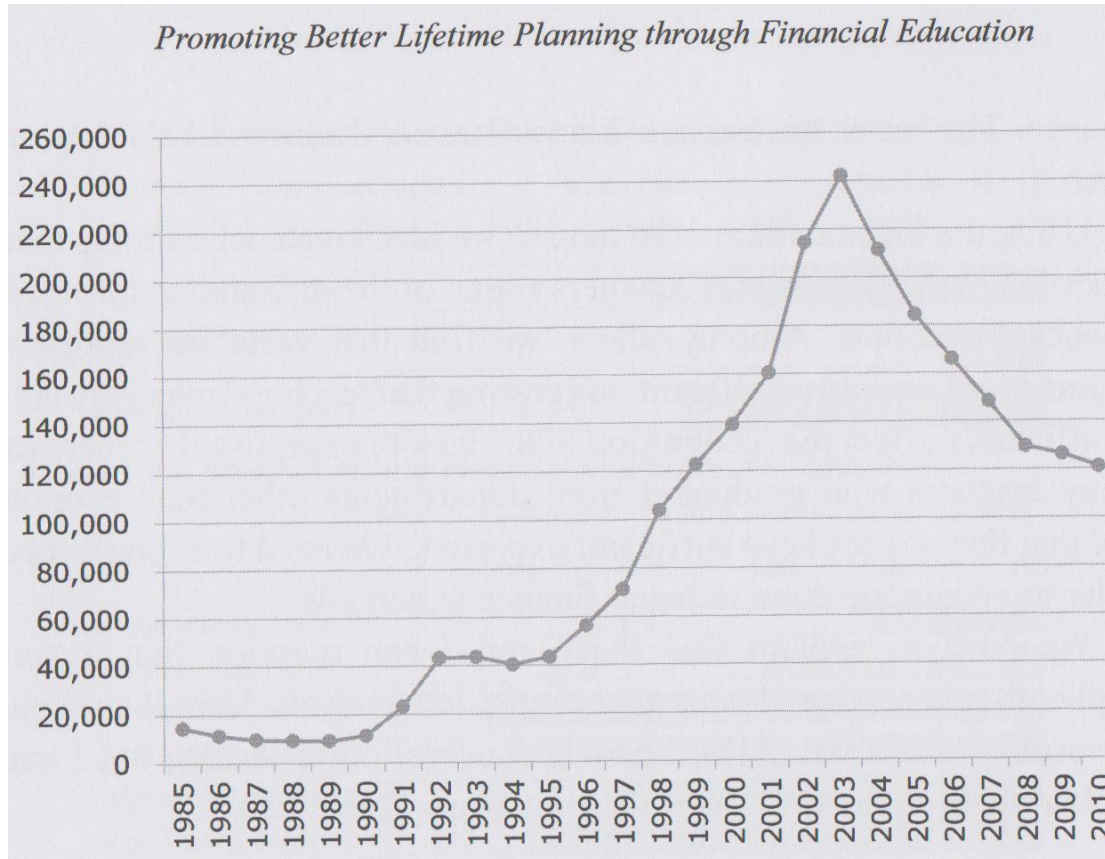
- 1, Bookkeeping**
- 2, Daily revenue and expenses**
- 3, Long-term planning**
- 4, Accurate reporting of their business**
- 5, Reduce default loan losses**

SME database

- 6, Asset Management by SME**
- 7, Pension Contribution by SME (50%)**

Asset Management of Reserves

SMEs' Debt Overhand



Theoretical Model

$$rL_{t-1} + C_t = Y_t + \Delta L_t \dots\dots\dots(1)$$

$$C_t = cY_t$$

$$Y_t = (1+a)Y_{t-1}$$

$$a = \frac{\Delta Y}{Y} = \frac{\Delta p}{p} + \frac{\Delta y}{y}$$

From (1), we can get -

$$rL_{n-1} + cY_n = Y_n + (L_n - L_{n-1})$$

$$\Leftrightarrow L_n = (1+r)L_{n-1} - (1-c)Y_n$$

$$\Leftrightarrow L_n = (1+r)\{(1+r)L_{n-2} - (1-c)Y_{n-1}\} - (1-c)Y_n$$

.....

$$\Leftrightarrow L_n = (1+r)^n L_0 - (1-c)\{(1+r)^{n-1}(1+a) + (1+r)^{n-2}(1+a)^2 + \dots + (1+a)^n\}Y_0$$

$$\Leftrightarrow L_n = (1+r)^n L_0 - \frac{(1-c)(1+a)}{(r-a)} \{(1+r)^n - (1+a)^n\}Y_0$$

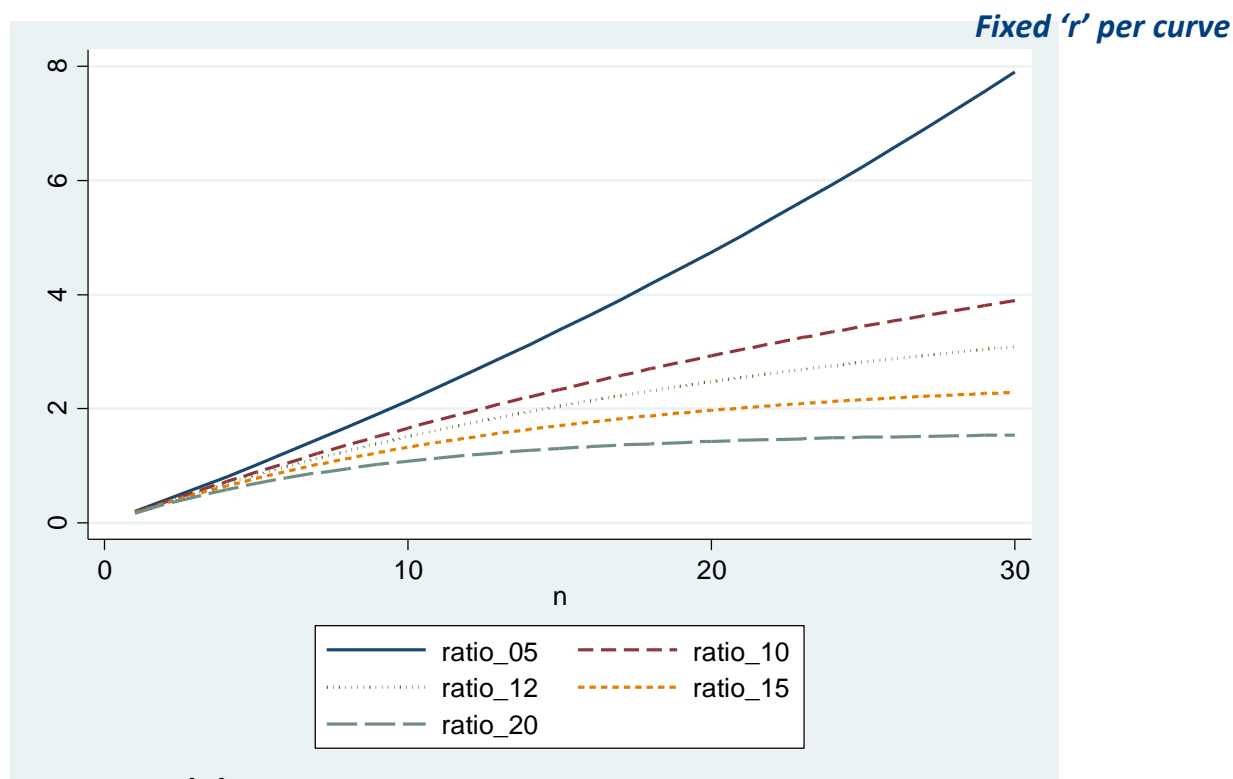
$$L_n = (1+r)^n L_0 - \frac{(1-c)(1+a)}{(r-a)} \{(1+r)^n - (1+a)^n\}Y_0 < 0$$

$$\frac{L_0}{Y_0} < \frac{(1-c)(1+a)}{(r-a)} \left\{ 1 - \left(\frac{1+a}{1+r} \right)^n \right\}$$

$$\frac{L_0}{Y_0} < \frac{(1-c)(1+a)}{(r-a)} \left\{ 1 - \left(\frac{1+a}{1+r} \right)^n \right\}$$

- 1, L_0/Y_0 = [Initial Loan/Income] ratio
- 2, r = Interest Rate
- 3, n = number of years of borrowing
- 4, a = growth rate of income
- 5, c = marginal propensity to consume

Case of India: (L/Y) and loan maturity



X-axis: Years (n)

Y-axis: Ratio (L/Y)

MPC (c) = 0.80, a = 7%

Policy Recommendations

- ★ If income is not high and lending is short-term, the debt to income ratio should be very low
- ★ Importance of Financial Education for households and SMEs

New Money Lenders ' Law (JAPAN)

- 1, Maximum interest rate = 20%
- 2, Require License (FSA)
- 3, Paper examination
- 4, Prepare minimum Capital
- 5, $L/Y < 1/3$

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