Infrastructure Finance, and SME Finance

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Outlines

1, **Infrastructure investment**
   Finance
   Economic Effect of Infrastructure
   Utilize domestic Savings
   PPP
2, **SME development**
   Hometown Investment Trust Funds

Source of Financing Infrastructure Investment

(1) by tax payers' money;
(2)use of national savings (or postal savings);
      → Financial Inclusion
(3) issue bond to construct infrastructures;
(4)Public-Private-Partnership
→Too much borrowing from overseas
might become the burden for the future.

Savings/GDP and Investment/GDP
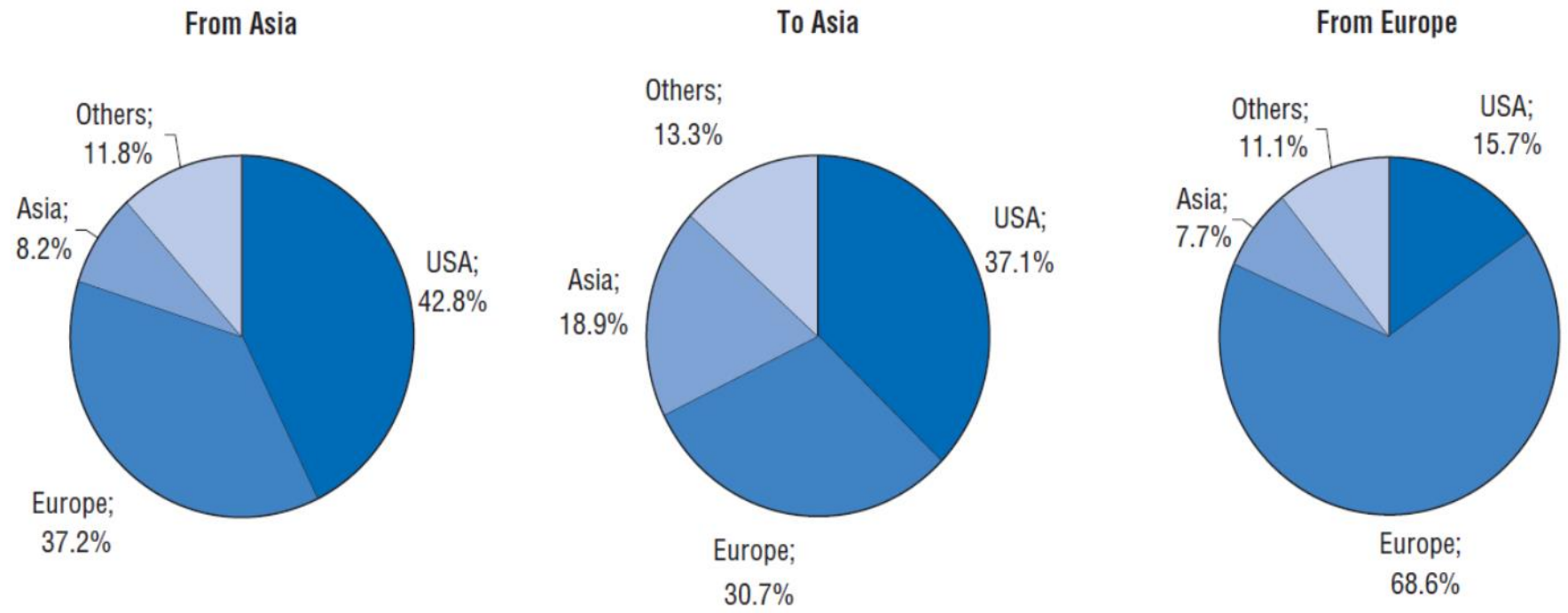
Table 1. Savings and Investment Ratios in Asia

Economy	Savings/GDP Ratio (%)			Investment/GDP ratio (%)		
	2007	2010	2011	2007	2010	2011
PRC Mainland	51.9	53.4	53.8	41.7	48.2	48.7
Hong Kong, China	33.3	29.9	29.2	20.9	23.7	23.8
Indonesia	27.3	33.3	31.1	24.9	32.5	32.9
Japan	28.5	23.8	23.9	23.7	20.2	21.4
Republic of Korea	31.5	31.9	29.6	29.4	29.2	28.2
Malaysia	37.5	32.9	33.1	21.6	21.4	21.8
Philippines	22.1	24.8	22.3	16.9	20.5	20.5
Singapore	48.4	46.0	45.8	21.1	23.8	26.0
Thailand	32.8	30.6	30.4	26.4	25.9	25.6

Note: Savings rate = gross national saving/GDP; Investment rate = gross capital formation/GDP.
Source: IMF, *World Economic Outlook Database*.

4

Asians- *Invest in Government Bond*
Overseas Investors - Stocks

Figure 1. **Portfolio investment from the Asian region to the world and vice versa**

Direction of Portfolio investment

From Asia

- Others; 11.8%
- Asia; 8.2%
- USA; 42.8%
- Europe; 37.2%

To Asia

- Others; 13.3%
- USA; 37.1%
- Asia; 18.9%
- Europe; 30.7%

From Europe

- Others; 11.1%
- USA; 15.7%
- Asia; 7.7%
- Europe; 68.6%

5

Lack of Liquid Financial Market

1, Lack of Long term investors in Asia

     Bank dominance

     Life insurance   long-term investor
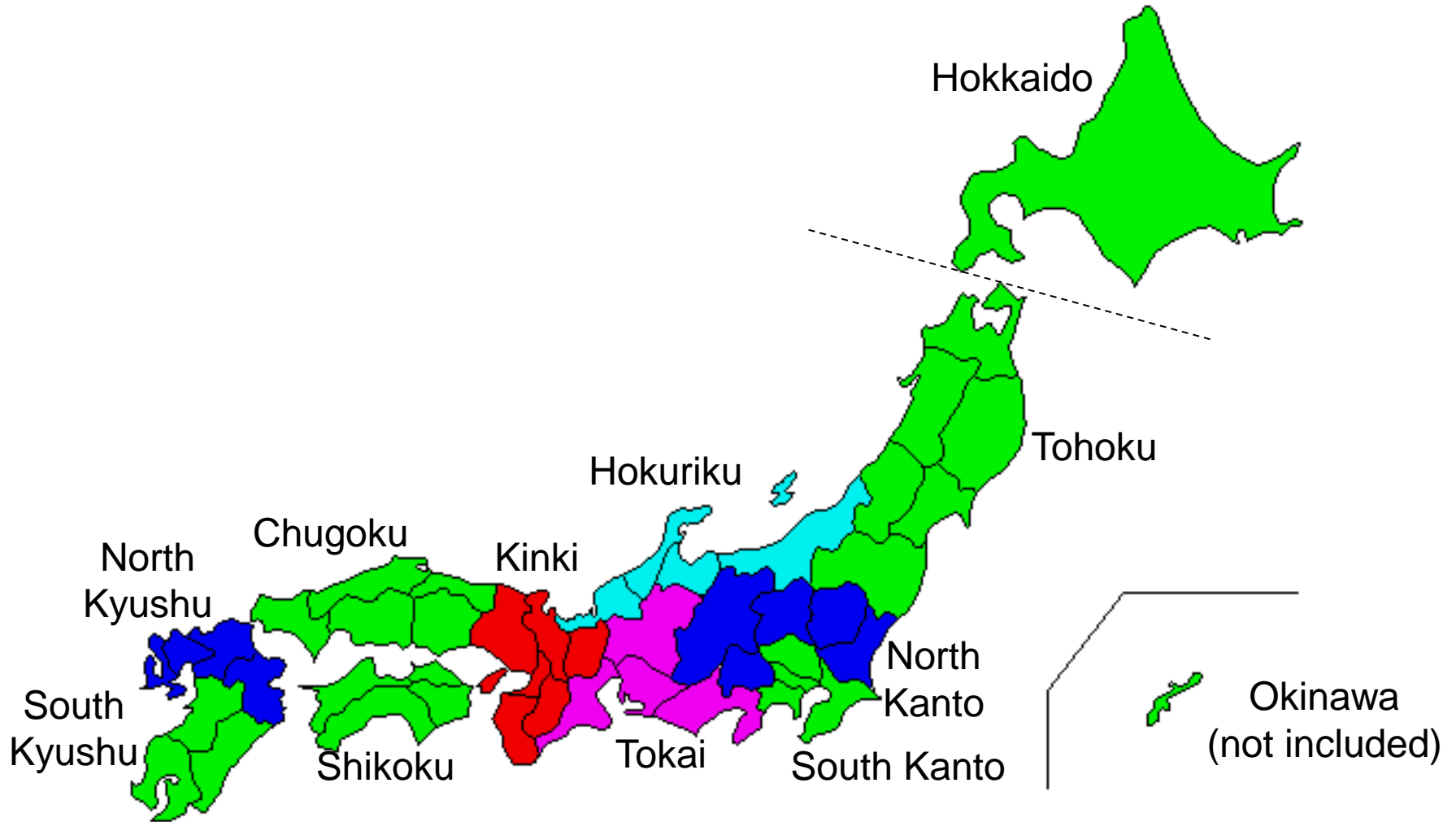
     Pension funds

2, Various Infrastructure revenue bond

     ADBI – Issue infrastructure bond

         various maturities
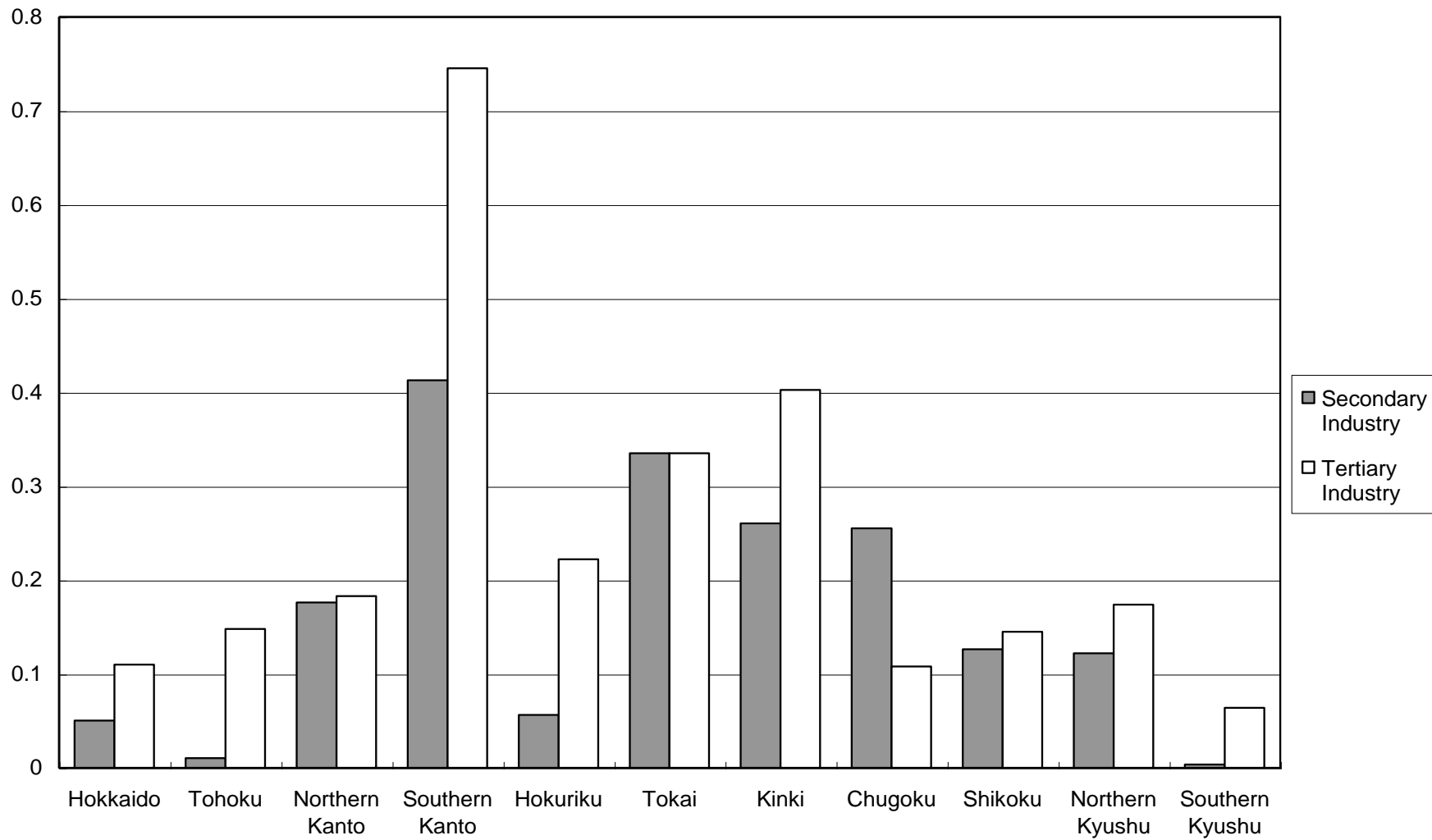
         continuous issues

         to develop secondary market

Map of Japan from the North to the South

Hokkaido

Tohoku

Hokuriku

Chugoku

Kinki

North
Kyushu

North
Kanto

South
Kyushu

Shikoku

Tokai

South Kanto

Okinawa
(not included)

Marginal Productivity of Public Capital
(Regional Disparity)

Economic Effect of Public Capital
Translog Production Function

$$Y_t = f(Kp, L, Kg)$$

$$\ln Y = \alpha_0 + \alpha_1 \ln Kp + (1 - \alpha_1) \ln E + \alpha_3 \ln Kg$$

$$+ \ln Kp \left(- \frac{1}{2} \beta_2 \ln Kp + \beta_2 \ln E + \beta_3 \ln Kg\right) \quad (4)$$

$$+ \ln E \left(- \frac{1}{2} \beta_2 \ln E - \beta_3 \ln Kg\right) + \frac{1}{2} \beta_6 - (\ln Kg)^2$$

$$S_E = \frac{wE}{pY} = \frac{\partial \ln Y}{\partial \ln E} = (1 - \alpha_1) + \beta_2 \ln Kp - \beta_2 \ln E - \beta_3 \ln Kg$$
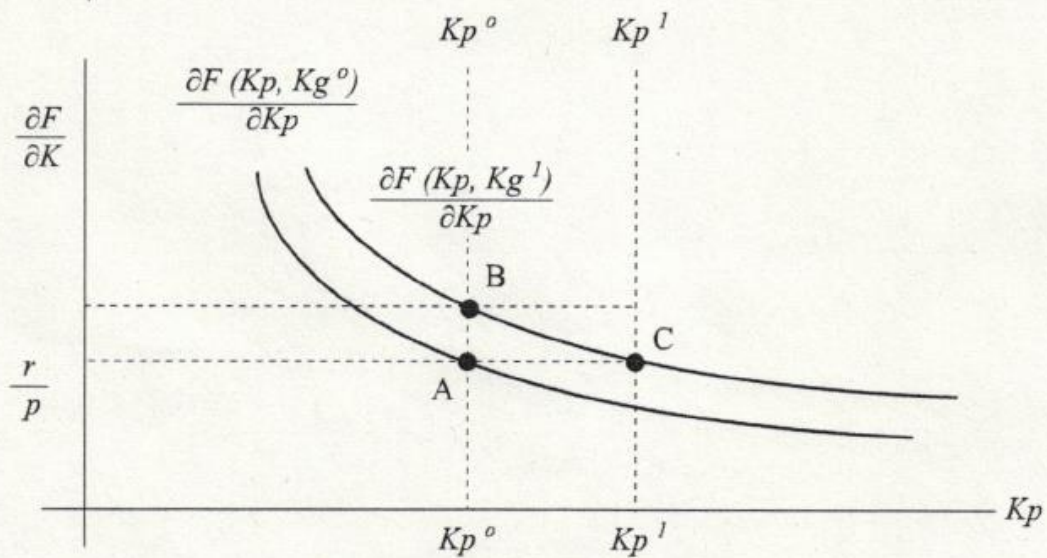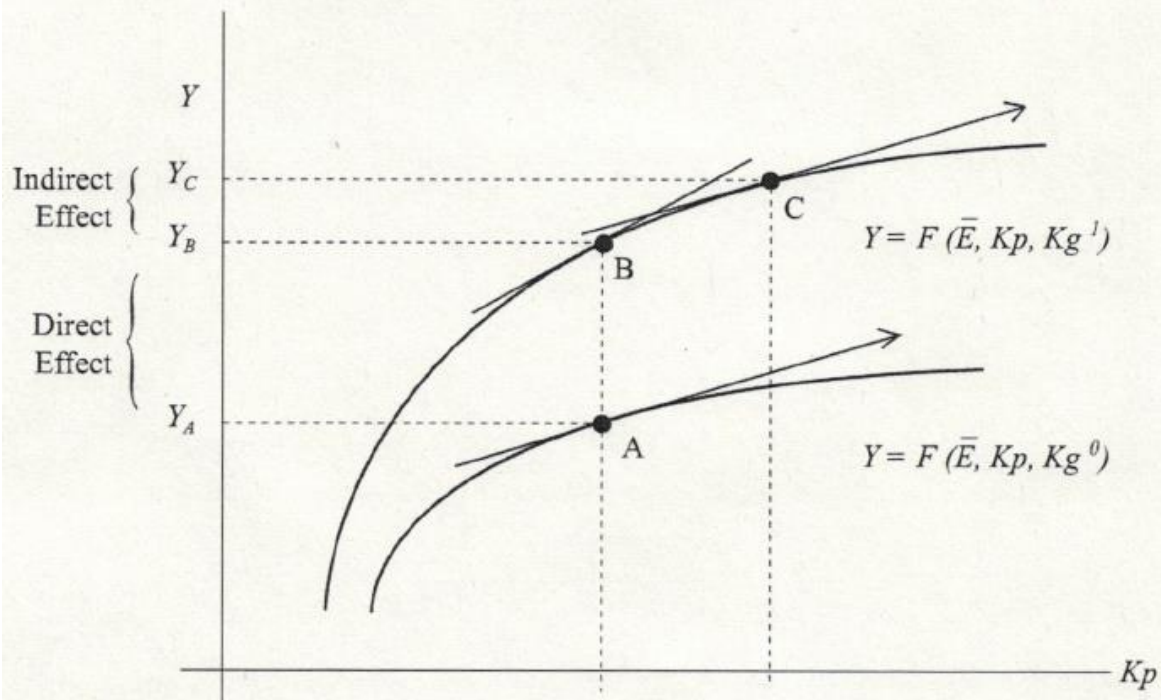$$(5)$$

Marginal Productivity of Public Capital

(2) Marginal Productivity

Period(FY)	1956–60	1961–65	1966–70	1971–75	1976–80
Direct Effect	0.696	0.737	0.638	0.508	0.359
Indirect Effect(Private Capital)	0.453	0.553	0.488	0.418	0.304
Indirect Effect(Labor Input)	1.071	0.907	0.740	0.580	0.407
Private Capital	0.444	0.485	0.452	0.363	0.294

Period(FY)	1986–90	1991–95	1996–00	2001–05	2006–10
Direct Effect	0.215	0.181	0.135	0.114	0.108
Indirect Effect(Private Capital)	0.195	0.162	0.122	0.100	0.100
Indirect Effect(Labor Input)	0.192	0.155	0.105	0.090	0.085
Private Capital	0.272	0.242	0.219	0.202	0.194

Explanation of Direct and Indirect Effects

$$Y = F\,(\bar{E},\, Kp,\, Kg^{\,1})$$

$$Y = F\,(\bar{E},\, Kp,\, Kg^{\,0})$$

$$\frac{\partial F\,(Kp,\, Kg^{\,0})}{\partial Kp}$$

$$\frac{\partial F\,(Kp,\, Kg^{\,1})}{\partial Kp}$$

Effectiveness of Public Capital Stock
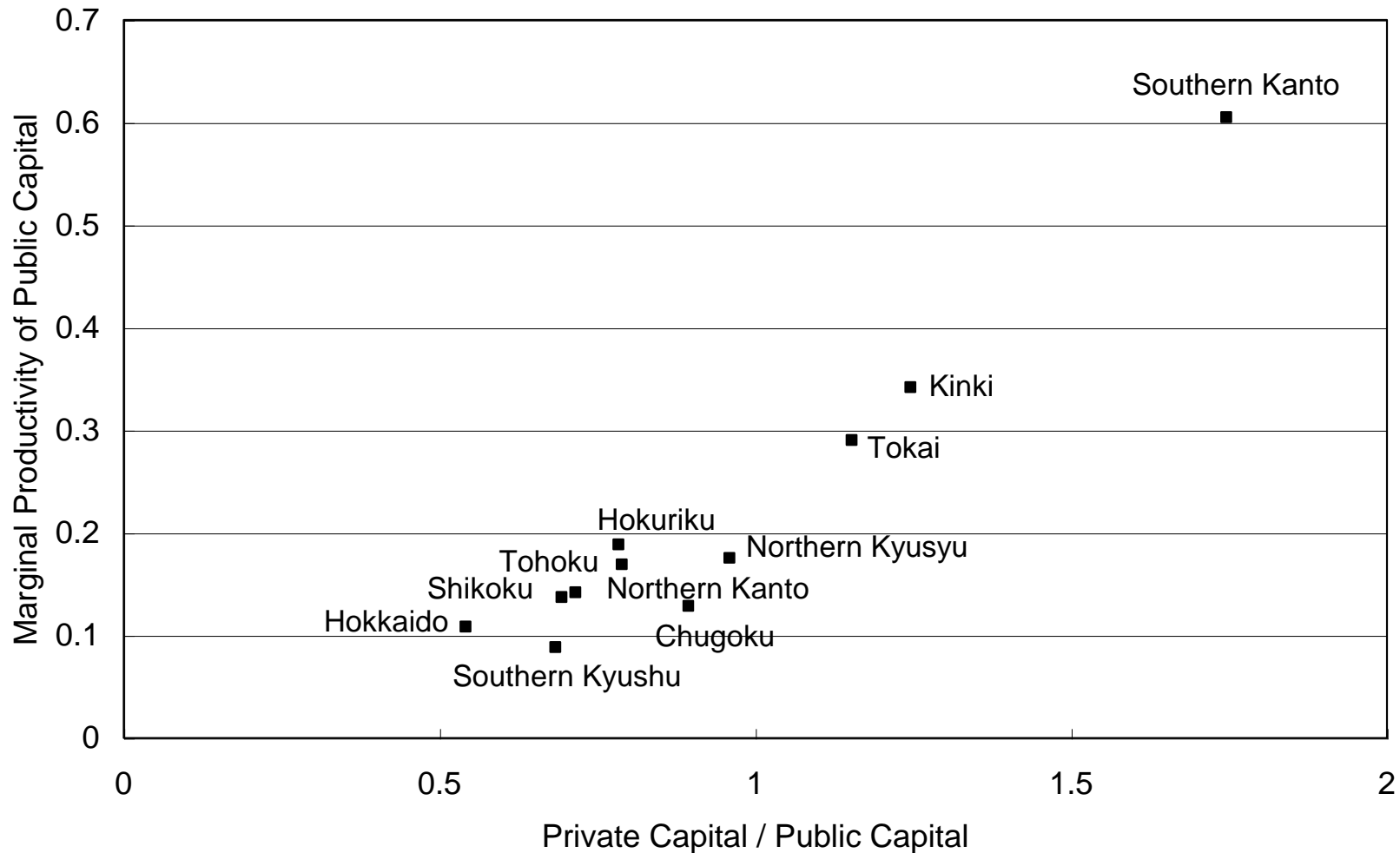### *- "Private capital/Public capital ratio" to "Marginal productivity of Public capital" -*

Secondary Industry (Industrial Sector)
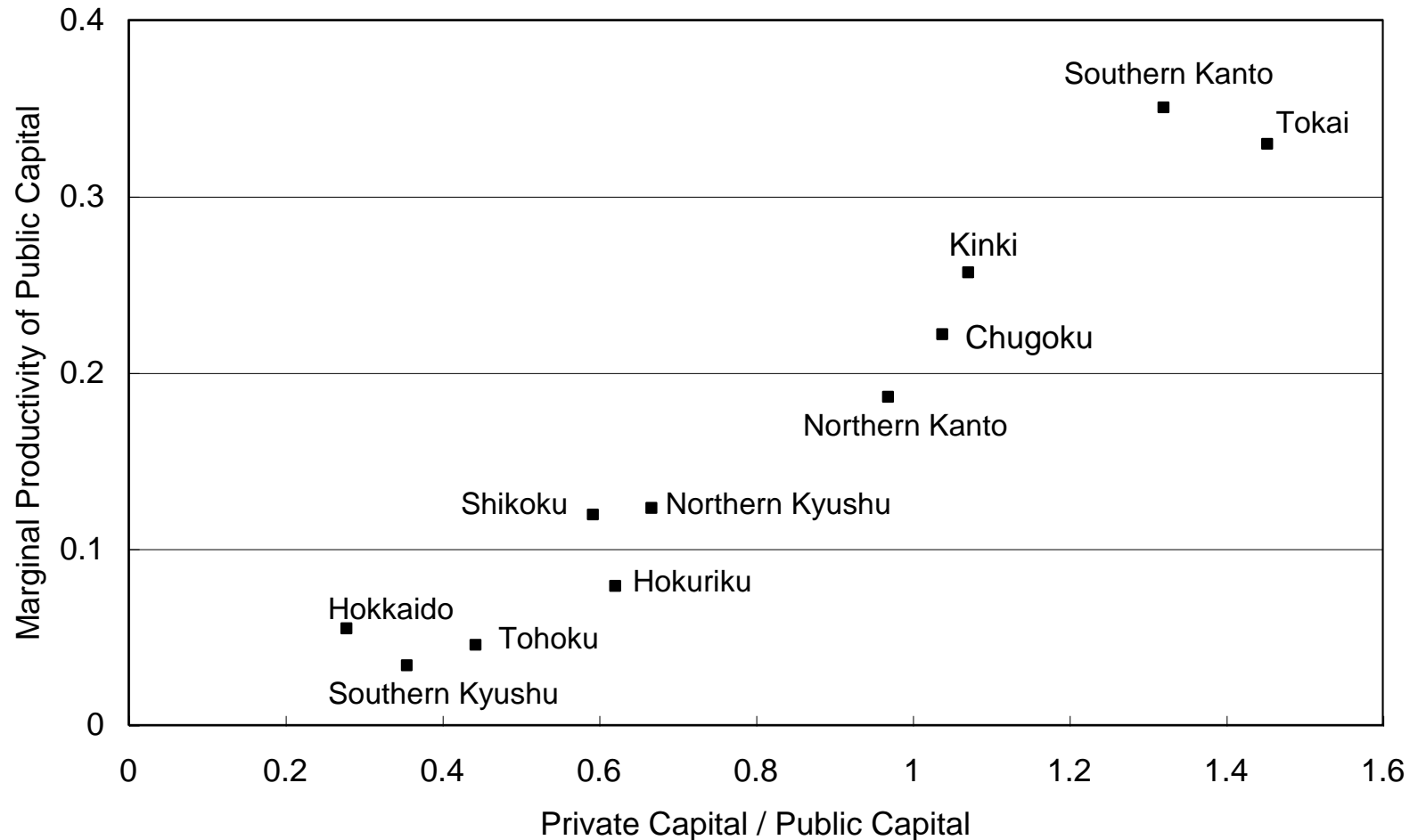
Effectiveness of Public Capital Stock
- "Private capital/Public capital ratio" to "Marginal productivity of Public capital" -

Tertiary Industry

Determinants of regional allocation of public investment (Political Power plays a role)

Table3 Allocation of Public Infrastructure in Japan: (Pooled data, 47 prefecture)

| Coeffcient	Explanatory Variables	Agriculture	Land Conservation	Industrial Infrastructure	Improvement of living standards y
α_0	Constant	-35.44 (-10.46**)	-34.26 (-11.32**)	-61.58 (-11.84**)	52.32 (8.00**)
α_1	Yp (Income)	0.01 (7.21**)	0.01 (13.18**)	0.02 (17.99**)	0.036 (25.86**)
α_2	Sp(AreaSize)	4970 (28.47**)	2090 (13.40**)	3855 (14.39**)	2730 (8.10**)
α_3	Rp(Political Power)	8280 (16.88**)	7274 (16.60**)	10956 (14.55**)	-7434 (-7.85**)
α_4	Dummy1	-23.21 (-6.69**)	-34.27 (-11.06**)	-59.81 (-11.23**)	-36.85 (-5.50**)
α_5	Dummy2	27.43 (9.26**)	-1.65 (-0.62)	65.87 (14.48**)	66.89 (11.70**)
Adj. R^2		0.675	0.486	0.458	0.527

(1) ( ) denotes t-value

(2) ** is significant with 99.0% level,

Rate of Return and the revenue bond

r

rG

Rate of return relies on performance of infrastructure

B

A

C

D
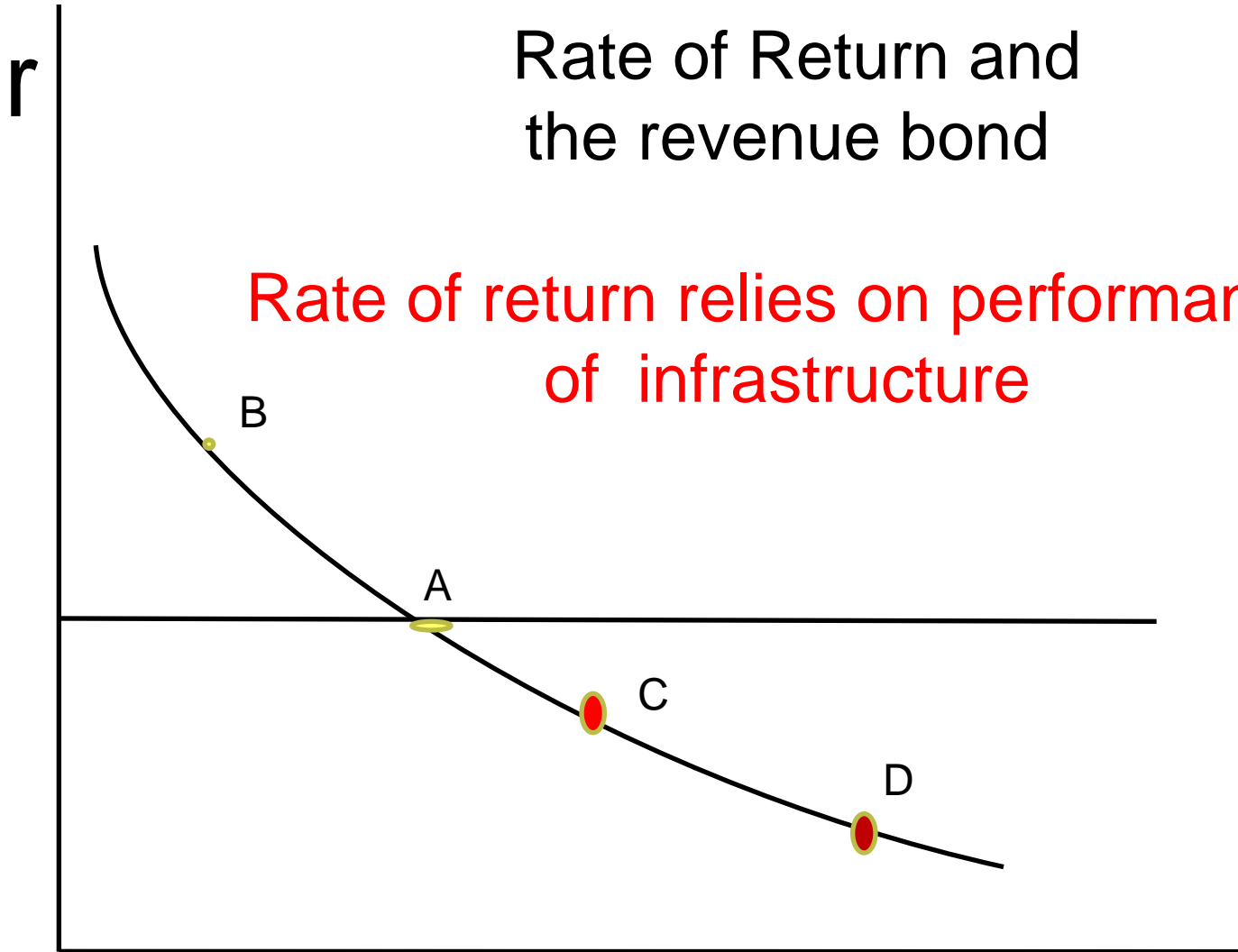
To Create Incentive Mechanism

To Avoid Moral Hazard Problem

	Normal Case	Revenue Bond
Normal Case	(50A,　r) Management　Investors company	(50A,　100B)
Revenue Bond	(100A,　r)	(100A,　100B) Management　　Investors Company

Public Private Partnership (PPP)

1, **Risk sharing** between private and public sector

2, Incentive to cut costs and to increase revenue

→ Avoid political intervention

→ **Bonus payment for employees who run infrastructure**

3, Many projects could be started by PPP

→ **Utilize domestic savings**

→ life insurance and Pension funds (**long term**)

4, **Indirect Effects are important**

(tourism, manufacturing, agriculture, services)

Impact : Infrastructure Investment

By Use of Tax Revenue (Philippines)
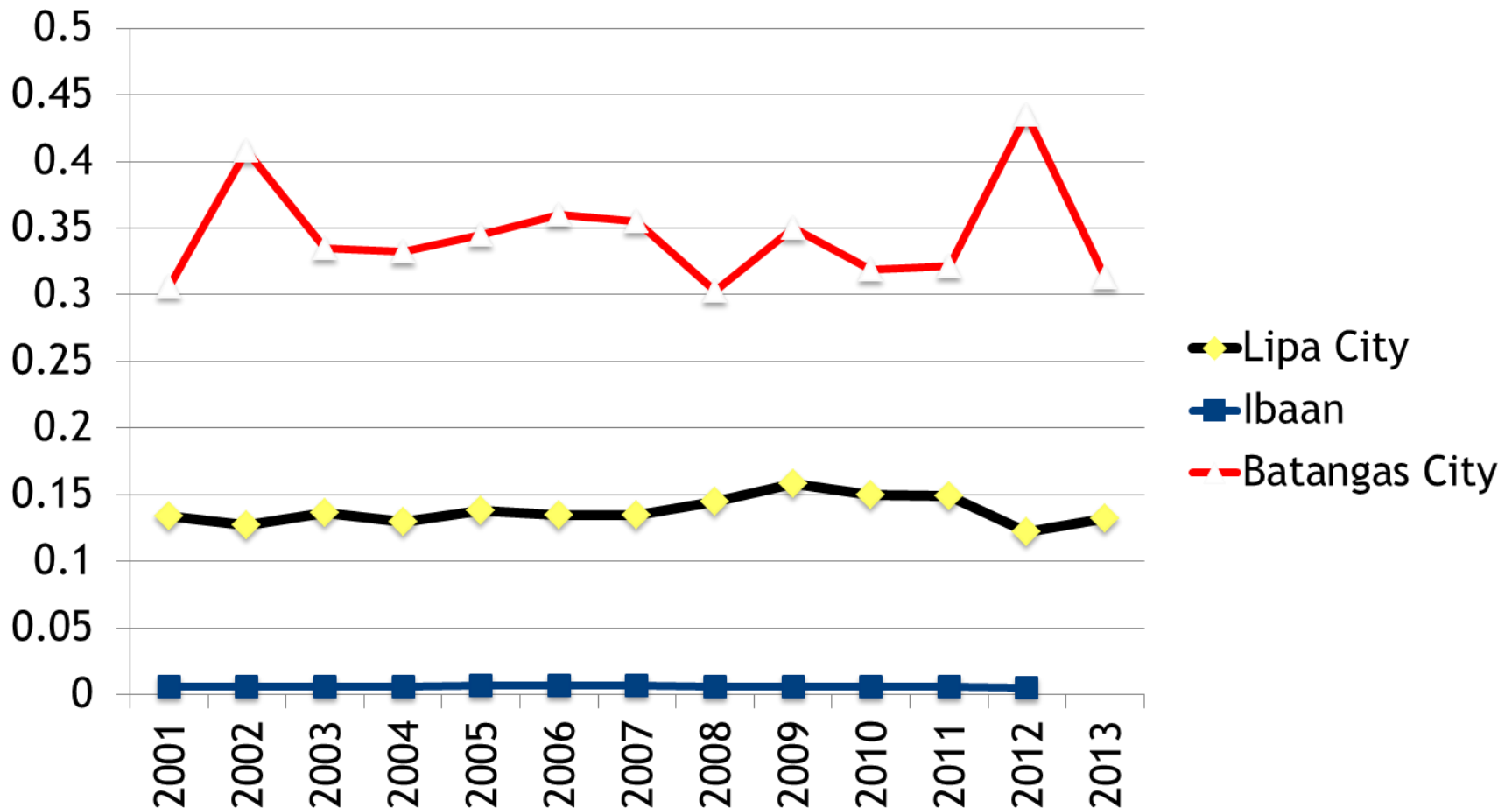
      Corporate Tax

      Income Tax

      Sales Tax

By Use of Regional GDP (Uzbekistan)

Highway :Treated group:Philippines
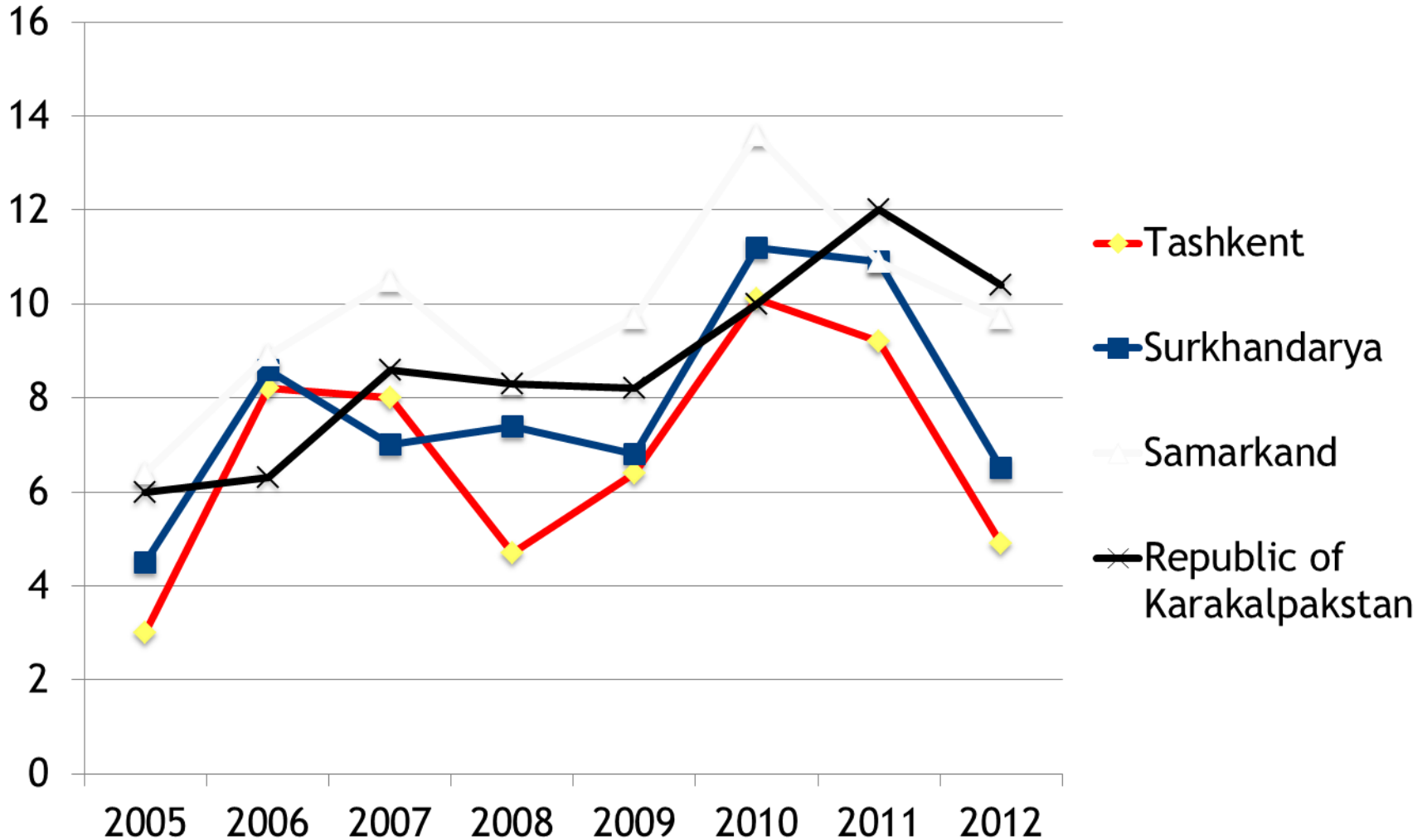
Municipality Revenue
Total Provincial Revenue
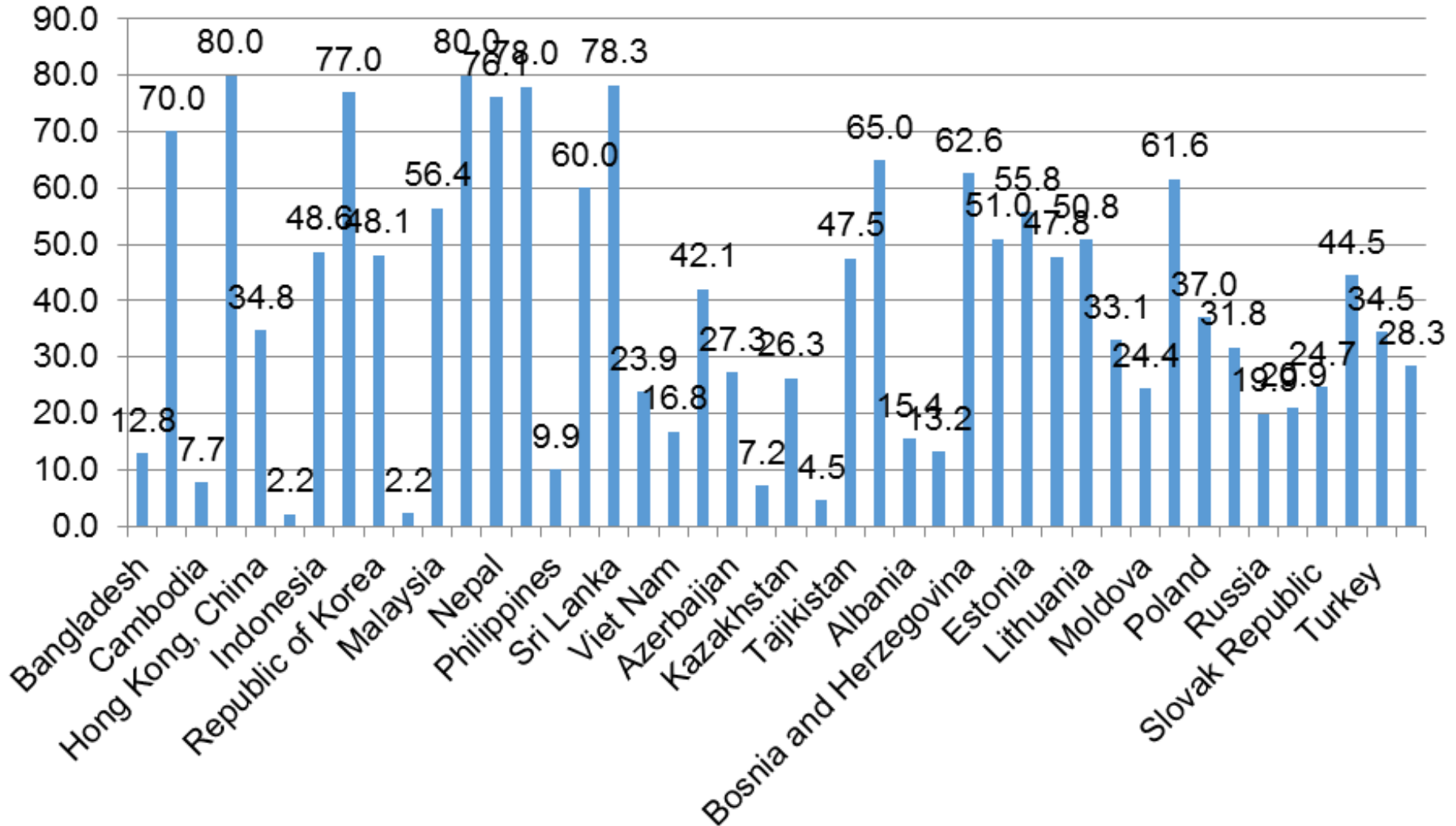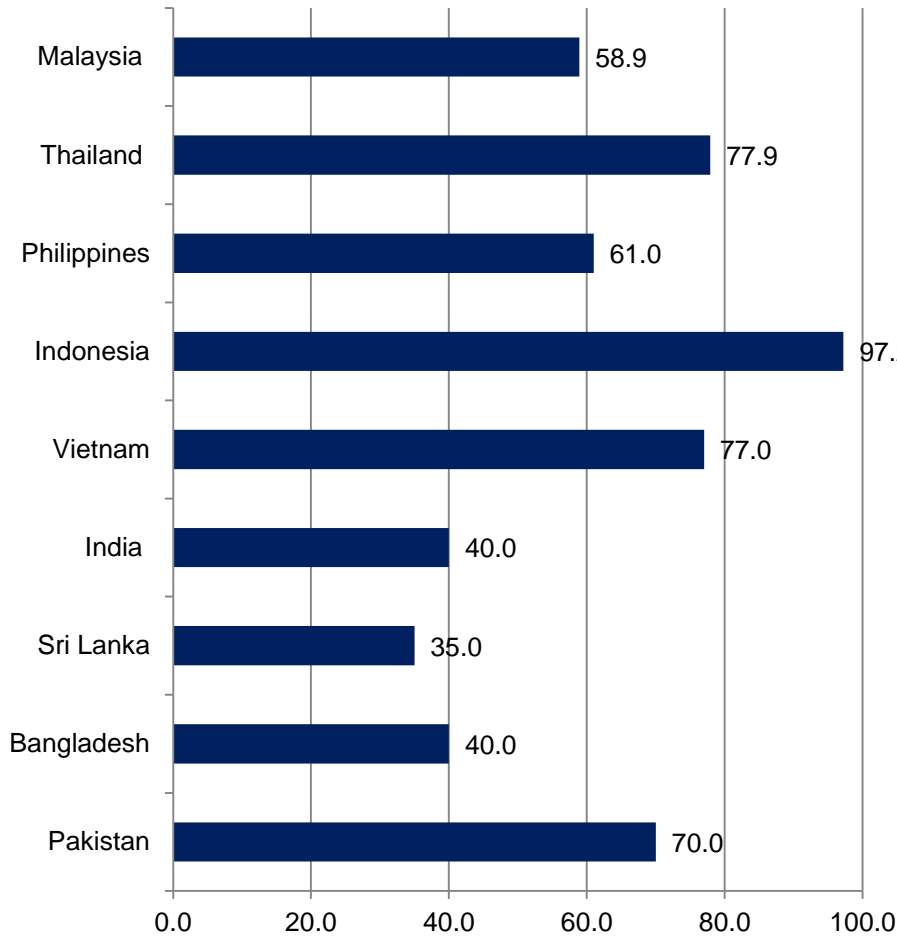
Railway:Treated group: Uzbekistan terminal stations were gained

SME Share in Employment (%)

SMEs are potential engine of Growth
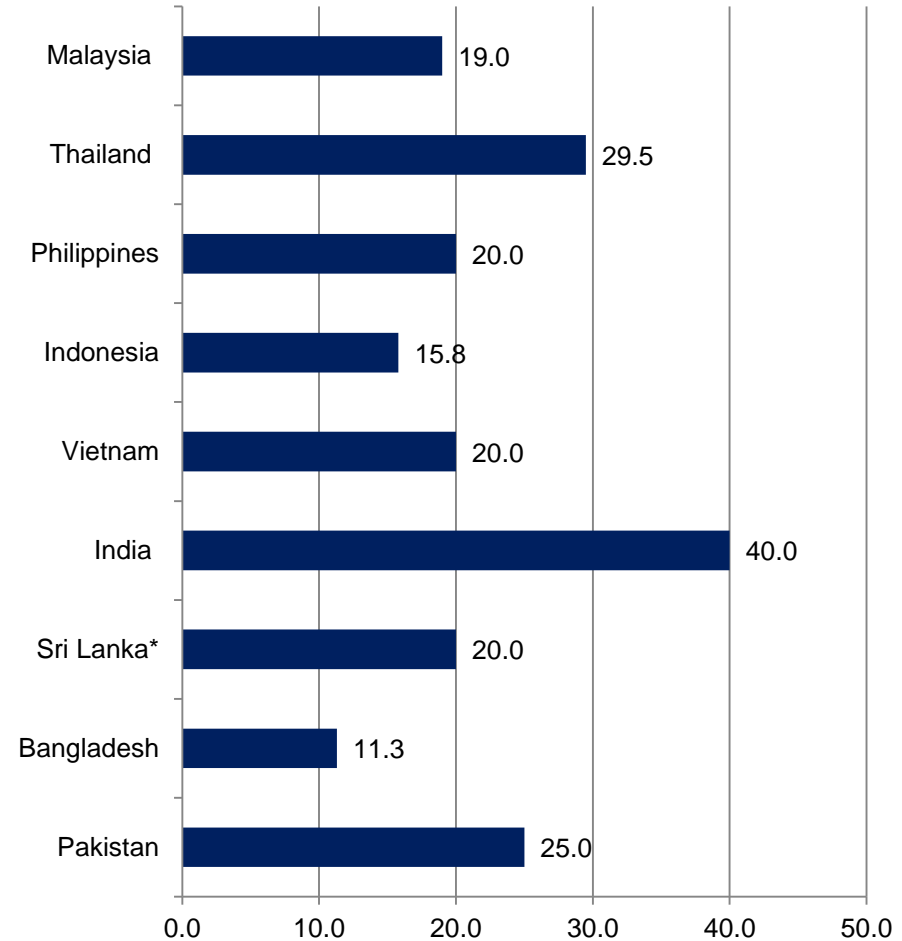## Toyota and Honda

SME share of total employment (%)

Country	Value
Malaysia	58.9
Thailand	77.9
Philippines	61.0
Indonesia	97.2
Vietnam	77.0
India	40.0
Sri Lanka	35.0
Bangladesh	40.0
Pakistan	70.0

SME share of total exports (%)

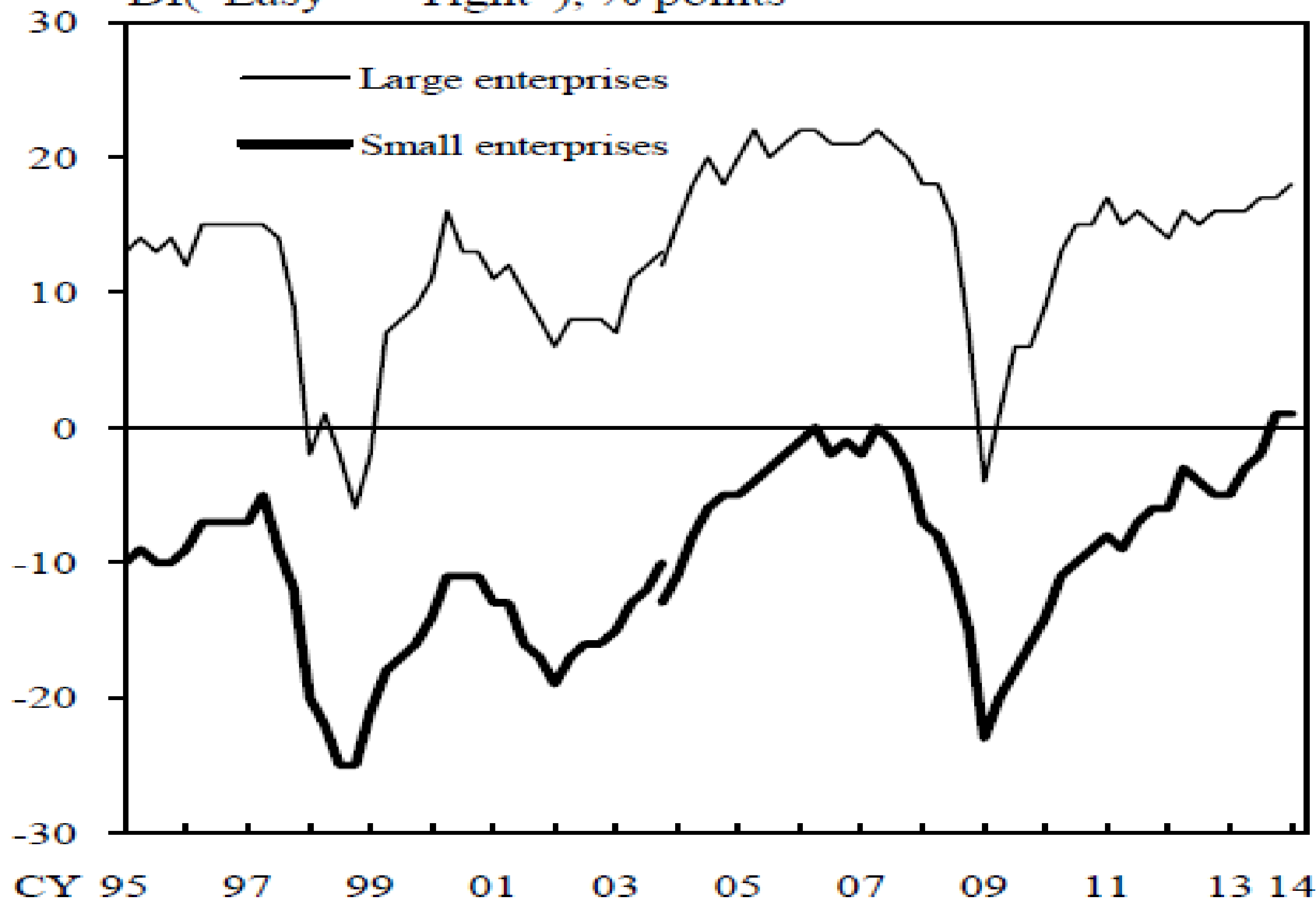| Country	Value
Malaysia	19.0
Thailand	29.5
Philippines	20.0
Indonesia	15.8
Vietnam	20.0
India	40.0
Sri Lanka*	20.0
Bangladesh	11.3
Pakistan	25.0

Benefits of Infrastructure investment to SMEs

1, Water supply, sanitation, electricity

2, Schools and various public services

3, Finance to SMEs

4, Subsidies do not help SMEs

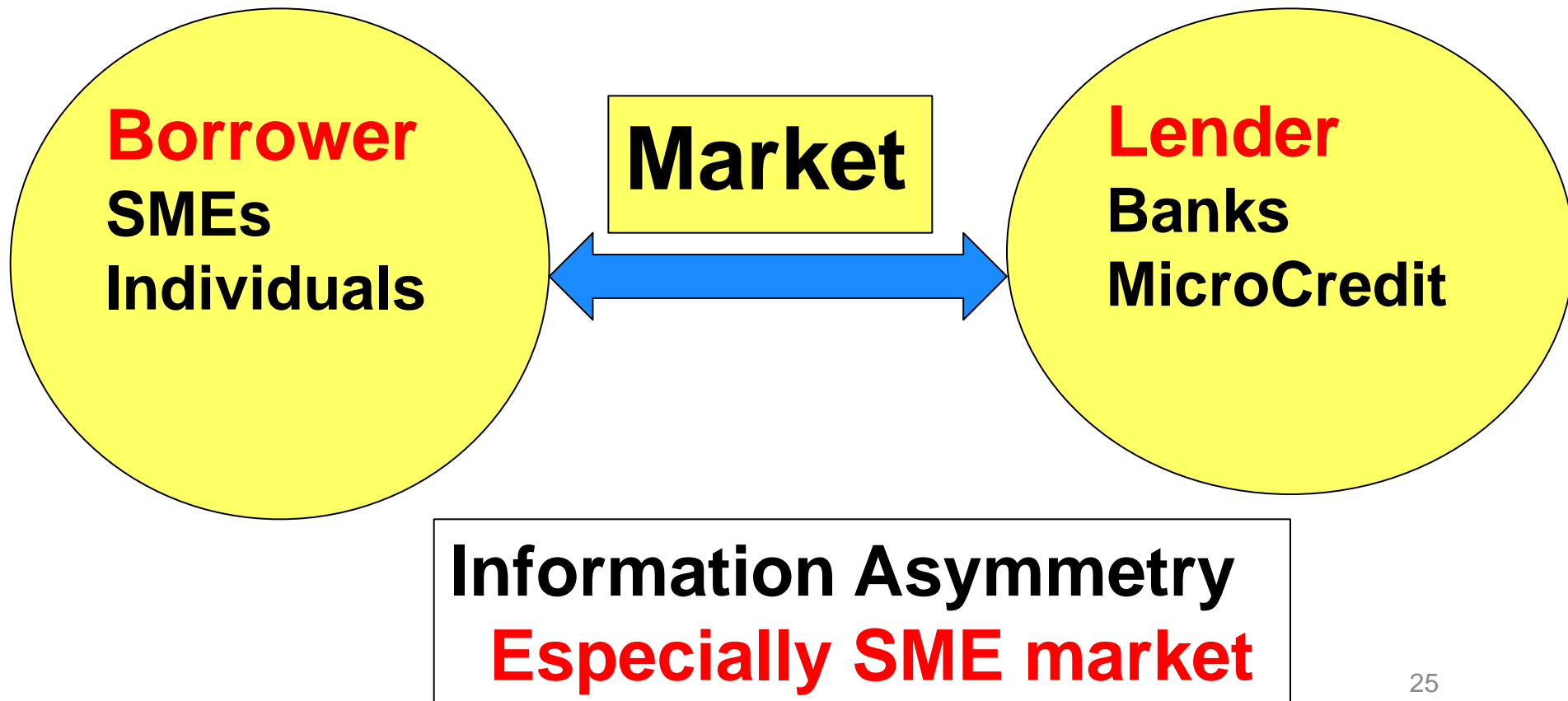5, Human capital improvement of SMEs by local government

(1) Financial Position

\<Tankan[1]\>

DI("Easy" - "Tight"), % points

Borrower, Lender and Market
Lack of Data of SMEs

Borrower
SMEs
Individuals

Market

Lender
Banks
MicroCredit

Information Asymmetry
Especially SME market

Community Infrastructure

Wind power Generator Funds

Agricultural Farmer's Trust Fund

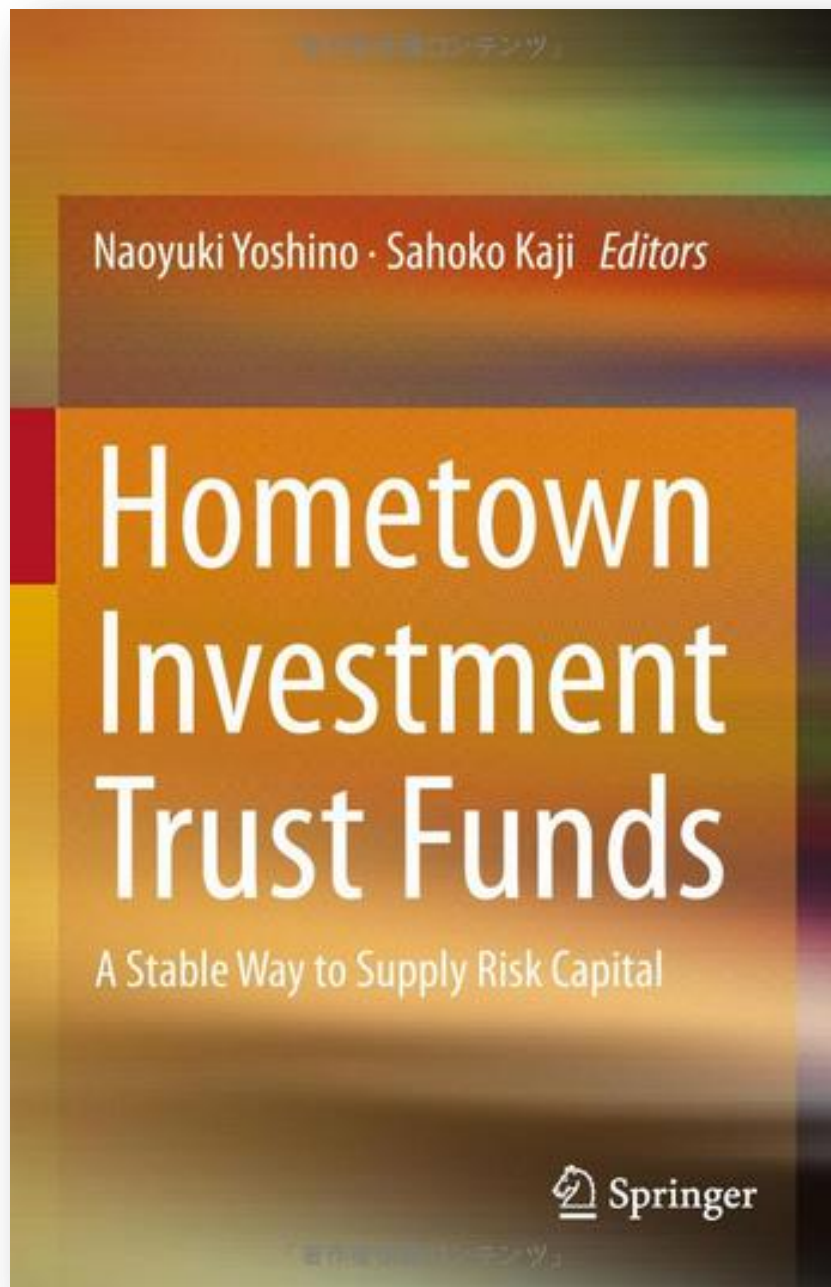**SME Hometown Trust Fund**

local airport

Large Projects

Pension funds, Insurance funds

infrastructure bond

Home town Investment Trust Funds

*A Stable Way to Supply Risk Capital
(i.e. knowledge base companies)*

*Naoyuki YOSHINO
Sahoko KAJI*

Donation and Investment to community
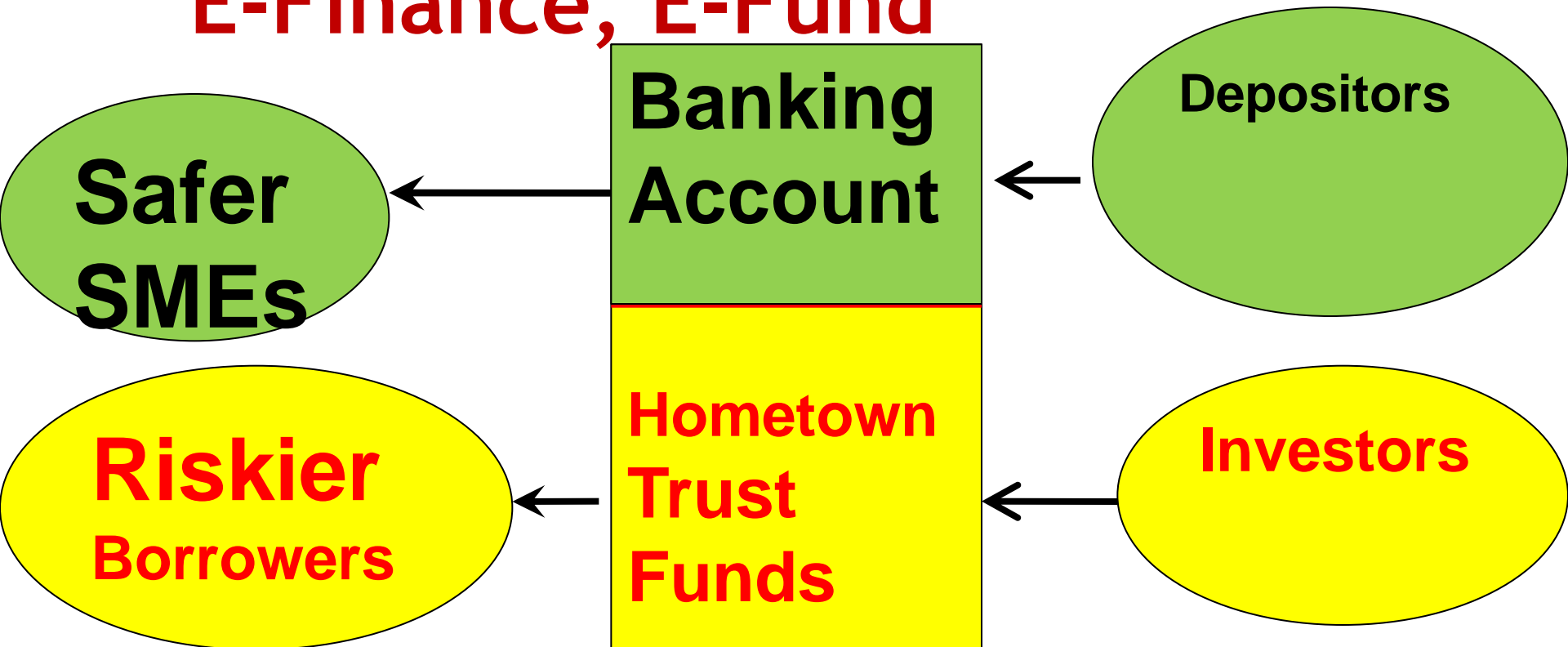
Agricultural Funds
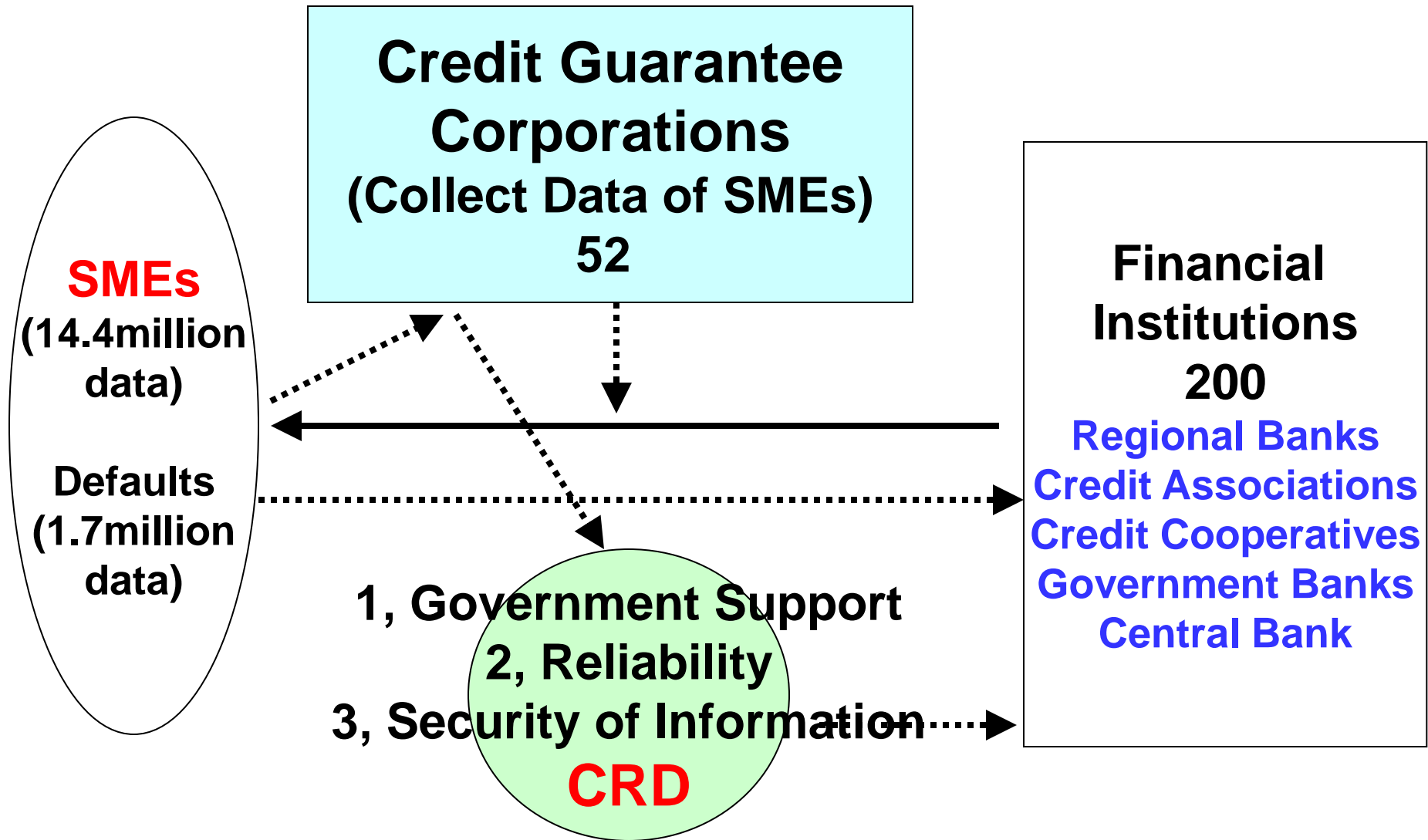
Beans and Wine

Dec 11 2013 , Tehran - I
IRAN

Bank based SME financing and Regional financing to Riskier Borrowers

1, Bank Loans to relatively safer borrower

2, Hometown Investment Trust Funds/

E-Finance, E-Fund

SME Data base (CRD Data base)

Credit Guarantee Corporations
(Collect Data of SMEs)
52

SMEs
(14.4million data)

Defaults
(1.7million data)

Financial Institutions 200
Regional Banks
Credit Associations
Credit Cooperatives
Government Banks
Central Bank

1, Government Support
2, Reliability
3, Security of Information
CRD

Four Accounts by SME

1, Account to show **Bankers**

2, Account to show **tax authority**

3, His own account

4, Account to show to **his wife**

Keeping books by SMEs

<Financial statements>

    (i) Cash & deposits

    (ii) Amount of Sales

    (iii) Inventories

    (iv) Buying price

    (v) Amount of goods laid in

    (vi) Various costs

        Equipment and Personal costs

    (vii) net profits

- **1363 SMEs of one Asian bank examined**
- **11 most significant ratios(variables) selected**

	Symbol	Variables examined	Category
1	STD_Equity	Short Term Debt/Equity (Book Value)	
2	Equity_TD	Equity (Book Value)/Total Liabilities	Leverage
3	TD_Tassets	Liabilities/Total Assets	
4	Cash_Tassets	Cash/Total Assets	
5	WC_Tassets	Working Capital/ Total Assets	Liquidity
6	LIQ_Sales	Cash/Net sales	
7	EBIT_Sales	Ebit/Sales	
8	ROA	Net Income/Total Assets	
9	Rinc_TA	Retained Earnings/ Total Assets	Profitability
10	Ninc_s	Net Income/Sales	
11	EBIT_IE	Ebit/Interest Expenses	Coverage
12	Sales_TA	Sales/Total Assets	
13	AP_Sales	Account Payable/Sales	Activity
14	AR_TD	Account Receivable/Liabilities	

Note: Ebit denotes Earnings Before Interest and Taxes

Principle Component Analysis (PCA)

Table 4. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	**Total**	% of Variance	Cumulative %
1	**3.30**	30.00	30.00	3.30	30.00	30.00
2	**2.19**	19.90	49.90	2.19	19.90	49.88
3	**1.25**	11.38	61.25	1.25	11.38	61.26
4	**1.08**	9.78	71.03	1.08	9.78	71.03
5	0.94	8.56	79.60			
6	0.75	6.79	86.37			
7	0.56	5.09	91.47			
8	0.48	4.36	95.82			
9	0.32	2.87	98.69			
10	0.13	1.14	99.84			
11	0.09	0.17	100.00			

Note: Extraction Method: Principal Component Analysis.
When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

36

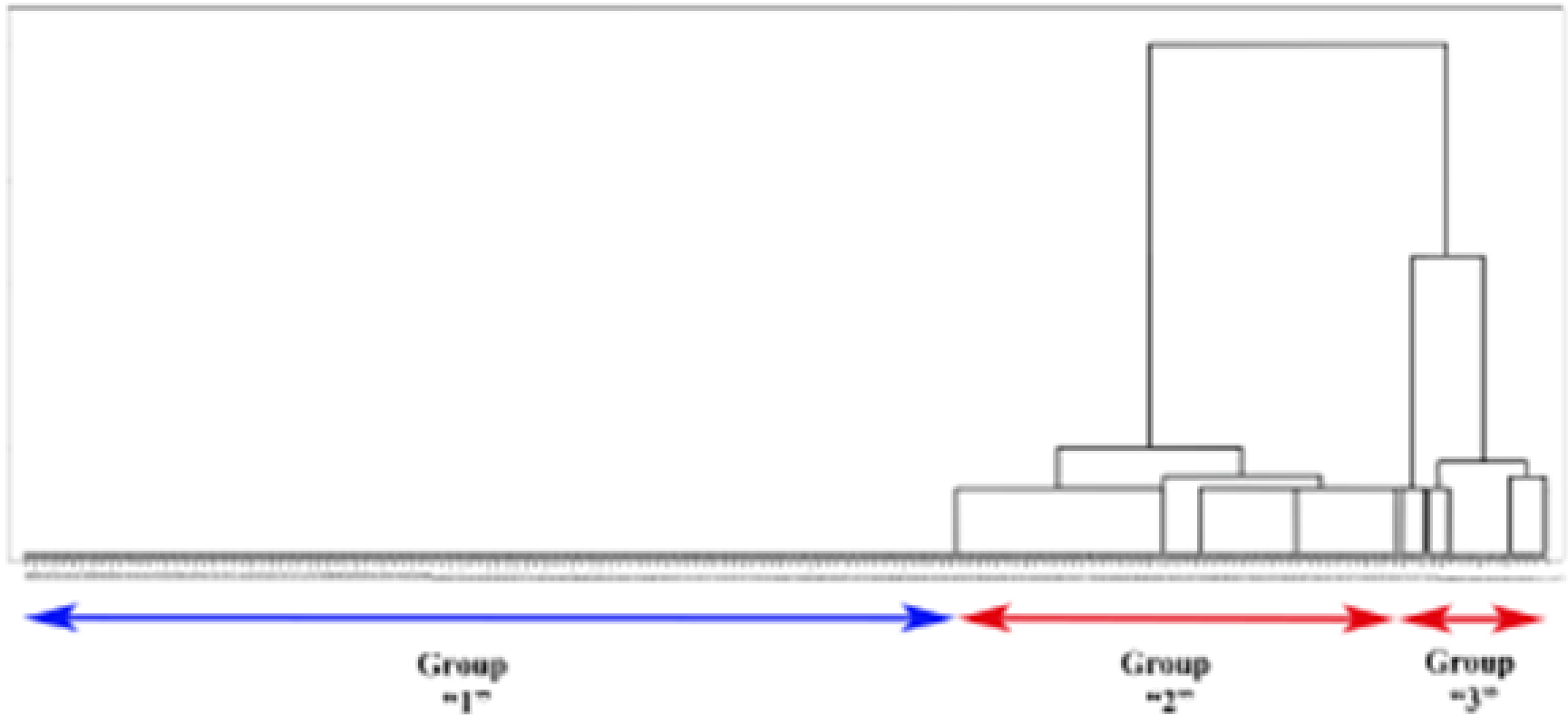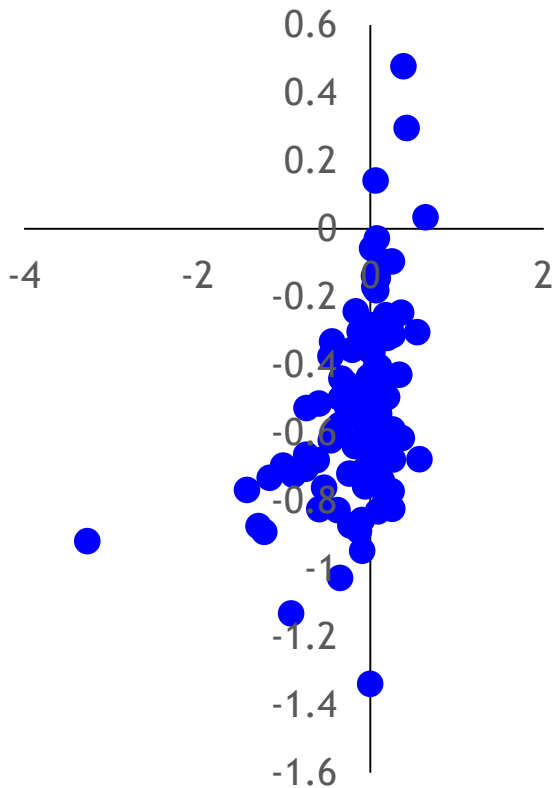# *Credit Rating of SMEs by Use of Asian Data*
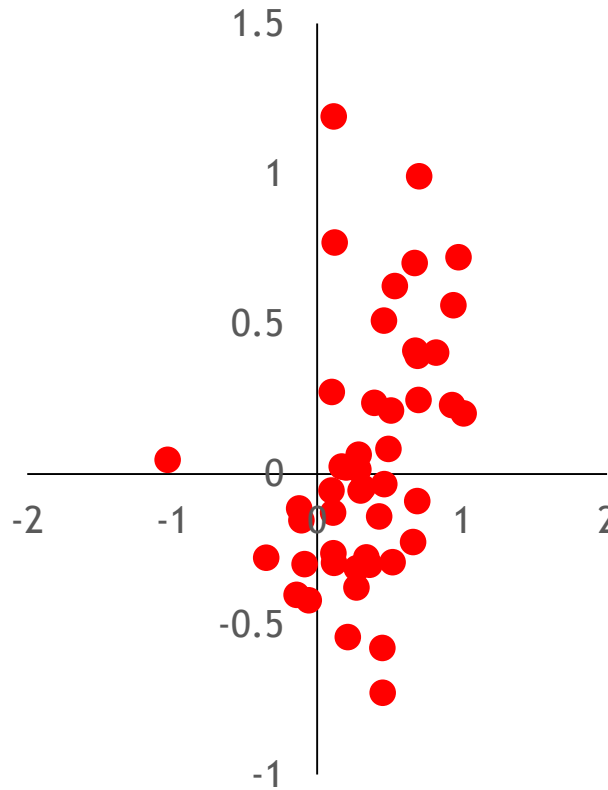
(i) Sales

(ii) Assets

(iii) Liquidity

(iv) Total Debt

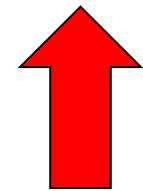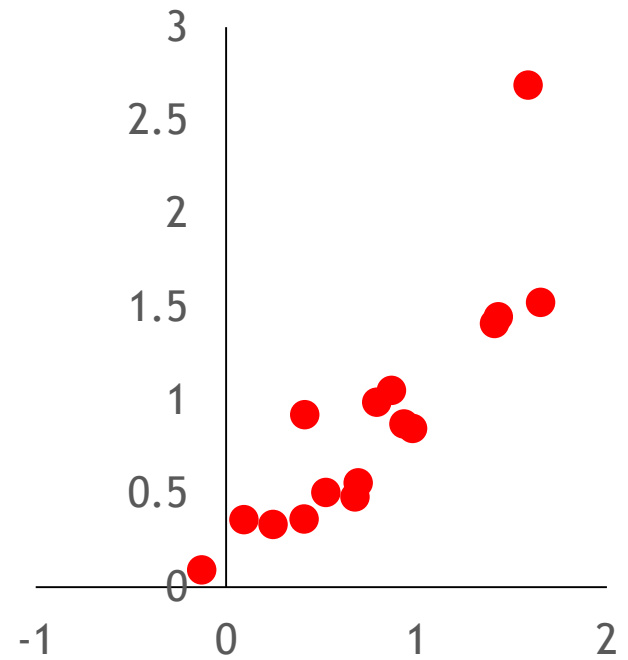Figure 8. Dendrogram Using Average Linkage

Z1-Z2 Group B

Z1-Z2 Group A-1

Z1-Z2 Group A-2

Healthier Group of SMEs

References

Yoshino, Suzuki, Maehara and Abe (2009) Development of Corporate Credit Information Database and Credit Guarantee System,   ASEAN Secretariat, Feb. 2009.

Yoshino, N. (2010) "Financing Transport Infrastructure Development in Southeast Asia" *OECD, Southeast Asian Economic Outlook*, 2010, Nov., Chapter 6, OECD, Paris.

Yoshino N. (2012) "The Global Imbalance and the Development of Capital Flows among Asian Countries", *OECD Journal: Financial Market Trends*, Volume 1, 2012

Yoshino N. Kaji, S. and Asonuma T. (2012) "Choices of Optimal Monetary Policy Instruments Under the Floating and the Basket-Peg Regimes", *Singapore Economic Review*, December 2012.

Yoshino N. Kaji, S. (2013) Hometown Investment Trust Funds, Springer, March 2013

References

Yoshino,N and T. Hirano (2012) "Counter-Cyclical Buffer of the Basel Capital Requirement and Its Empirical Analysis" , chapter in ***Current Developments in Monetary and Financial Law*** (Vol. 6): Restoring Financial Stability—The Legal Response, edited by the International Monetary Fund (IMF, 2012).

Farhad Taghizadeh and Naoyuki Yoshino (2013), "Monetary Policies and Oil Price Determination: An Empirical Analysis" , ***OPEC Energy Review*** 38(1): 1–20 (John Wiley & Sons, 2014).

Yoshino, N, S kaji and T Asonuma (2013), "Dynamic Transition of Exchange Rate Regime in China" ***China & World Economy***, Volume 22, Issue 3 (John Wiley & Sons, 2014..