Infrastructure Finance
Transparency and SME Promotion

Delhi, February 24, 2012

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Need for infrastructure bond market and finance to SMEs in Asia

1, High rate of savings in Asia
   1-1, Domestic Savings,
   1-2, Foreign reserves
2, Invest into US and European bond market
3, Short term investment from outside of Asia
   Stock investment and hedge funds
4, Huge needs for long term investment
5, Infrastructure investment and SME finance
6, Need for Regional Development
Need for the Structural Reform in Asian Financial Market

(1) “Using Asian Savings for Asian Investments” through development of Infrastructure bond markets to help develop bond markets in Asia.

(2) To facilitate financial inclusion of SMEs, which are the most numerous type of business structure in Asia, creating a SME database and developing regional trust funds.

(3) Supply side of finance: Need for long term Investors such as Pension funds and Insurance
Asia’s Characteristics

1. Large Share of SMEs (Small and Medium Enterprises)
2. Bank Dominated Market
3. Long term commitment
4. Large Share of Micro Credit
5. High Savings Rate
6. Infrastructure Investment
1. High savings rate of Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>Savings/GDP</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Investment/GDP</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>35.2</td>
<td>39.6</td>
<td>38.0</td>
<td>47.3</td>
<td>48.6</td>
<td>36.1</td>
<td>41.9</td>
<td>35.1</td>
<td>43.3</td>
<td>44.2</td>
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<tr>
<td>Hong Kong</td>
<td>35.7</td>
<td>29.6</td>
<td>31.9</td>
<td>33.0</td>
<td>32.2</td>
<td>27.0</td>
<td>34.1</td>
<td>27.5</td>
<td>20.6</td>
<td>21.3</td>
</tr>
<tr>
<td>Indonesia</td>
<td>32.3</td>
<td>30.6</td>
<td>31.8</td>
<td>27.5</td>
<td>28.2</td>
<td>30.8</td>
<td>31.9</td>
<td>22.2</td>
<td>24.6</td>
<td>24.9</td>
</tr>
<tr>
<td>Korea</td>
<td>37.3</td>
<td>36.5</td>
<td>33.9</td>
<td>33.2</td>
<td>30.8</td>
<td>37.5</td>
<td>37.6</td>
<td>31.0</td>
<td>30.1</td>
<td>29.4</td>
</tr>
<tr>
<td>Malayasia</td>
<td>34.4</td>
<td>39.7</td>
<td>46.1</td>
<td>42.8</td>
<td>42.2</td>
<td>32.4</td>
<td>43.6</td>
<td>26.9</td>
<td>20.0</td>
<td>21.9</td>
</tr>
<tr>
<td>Philippines</td>
<td>18.7</td>
<td>14.5</td>
<td>17.3</td>
<td>21.0</td>
<td>20.9</td>
<td>24.2</td>
<td>22.4</td>
<td>21.2</td>
<td>14.6</td>
<td>15.2</td>
</tr>
<tr>
<td>Singapore</td>
<td>44.0</td>
<td>50.1</td>
<td>46.9</td>
<td>48.6</td>
<td>51.4</td>
<td>37.1</td>
<td>34.5</td>
<td>33.3</td>
<td>19.9</td>
<td>22.6</td>
</tr>
<tr>
<td>Taiwan</td>
<td>27.6</td>
<td>26.8</td>
<td>25.5</td>
<td>25.6</td>
<td>26.7</td>
<td>22.9</td>
<td>25.2</td>
<td>23.3</td>
<td>21.4</td>
<td>21.2</td>
</tr>
<tr>
<td>Thailand</td>
<td>34.0</td>
<td>36.9</td>
<td>32.5</td>
<td>31.0</td>
<td>33.9</td>
<td>41.3</td>
<td>42.1</td>
<td>22.8</td>
<td>31.4</td>
<td>26.8</td>
</tr>
</tbody>
</table>

Source: Asian Development Bank, Key Indicators, 2009
Debt Securities Investment from Asia
(unit: million dollar)

EU, 834,866, 41%
US/Canada, 635,444, 32%
Others, 451,826, 23%
Asia, 75,531, 4%
US Treasury Bond Market

- Overseas Investors, 54%
- Government/Local government, 6%
- Central Bank, 8%
- Insurance, 2%
- Banks, 2%
- Mutual funds, 13%
- Individuals, 5%
- Pension Funds, 8%
- Others, 2%
US Treasury bonds (Holdings)

- China, 23.5%
- Japan, 21.0%
- Others, 15.2%
- Calibian Countries, 6.5%
- Oil Producing Countries, 5.9%
- Russia, 4.2%
- UK, 3.9%
- Brazil, 3.9%
- Luxemburg, 3.2%
- HngKong, 2.4%
- Taiwan, 2.3%
- Switzerland, 2.1%
- Ireland, 1.7%
- Singapore, 1.2%
- India, 1.2%
### Table 4  Where are investors into Asia ?

<table>
<thead>
<tr>
<th>Country</th>
<th>Country</th>
<th>UK</th>
<th>Euro region</th>
<th>Other Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thailand</strong></td>
<td>No1 EU</td>
<td>10.33</td>
<td>4.57</td>
<td>0.09</td>
</tr>
<tr>
<td>Total=3,108</td>
<td>No2 US</td>
<td>8.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No3 Singapore</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No4 Indonesia</td>
<td>1.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No5 Hong Kong</td>
<td>1.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Malaysia</strong></td>
<td>No1 EU</td>
<td>13.18</td>
<td>5.57</td>
<td>0.07</td>
</tr>
<tr>
<td>Total=3,781</td>
<td>No2 Singapore</td>
<td>7.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No3 USA</td>
<td>5.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No4 Hong Kong</td>
<td>1.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No5 Australia</td>
<td>1.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Singapore</strong></td>
<td>No1 EU</td>
<td>629.28</td>
<td>356.82</td>
<td>11.91</td>
</tr>
<tr>
<td>Total=2,016</td>
<td>No2 USA</td>
<td>290.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No3 Australia</td>
<td>169.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No4 Malaysia</td>
<td>167.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No5 Korea</td>
<td>90.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Debt Securities Investment in Asia (unit: million dollar)

- Asia, 73,512, 17%
- EU, 178,501, 41%
- US/Canada, 66,051, 15%
- Others, 115,328, 27%
Why Asians do not invest in Asia?

1. Lack of Financial Products
2. Lack of Information about Assets
3. Infrastructure bond
4. Community Investment
5. Green Projects Financing
Source of Financing Infrastructure Investment: (Pros and Cons)

1. by tax payers’ money;
2. use of national savings such as national savings banks (or postal savings);
3. issue government bond to construct infrastructures;
4. utilizes both public money and private sector money (i.e. Public-Private-Partnership).
Map of Japan from the North to the South

Hokkaido
Tohoku
Hokuriku
North Kanto
South Kanto
Tokai
Shikoku
South Kyushu
North Kyushu
Chugoku
Kinki
Hokuriku
Tohoku
Okinawa (not included)
Highway Map in Apr.1, 1980
Highway Map in Apr.1 2001
Economic Effect of Public Capital
(Productivity Effect)

TFP Regression

\[
\ln \left( \frac{TFP_t}{TFP_{t-1}} \right) = \ln \left( \frac{Y_t}{Y_{t-1}} \right) - s_{L,t} \ln \left( \frac{L_t}{L_{t-1}} \right) - (1-s_{L,t}) \ln \left( \frac{K_{P,t}}{K_{P,t-1}} \right)
\]

\[
\ln( TFP_t) = \alpha + \beta \ln( Public\ Capital_t) + u_t
\]

Translog Production Function

\[
Y_t = f(K_p, L, K_g)
\]

<table>
<thead>
<tr>
<th>Regressor</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dummy (1974-)</td>
<td>6.448**</td>
<td>4.599**</td>
<td>5.495**</td>
<td>4.183**</td>
</tr>
<tr>
<td>Dummy (1990-)</td>
<td>2.639</td>
<td>2.557**</td>
<td>1.641</td>
<td>1.603*</td>
</tr>
<tr>
<td>Public Capital</td>
<td>0.587**</td>
<td>0.432**</td>
<td>0.600**</td>
<td>0.487**</td>
</tr>
<tr>
<td>Public Capital (1974-)</td>
<td>-0.367**</td>
<td>-0.261**</td>
<td>-0.310</td>
<td>-0.235**</td>
</tr>
<tr>
<td>Public Capital (1990-)</td>
<td>-0.134</td>
<td>-0.129**</td>
<td>-0.080</td>
<td>-0.079*</td>
</tr>
<tr>
<td>Trend Term</td>
<td>0.110**</td>
<td>-</td>
<td>-0.068**</td>
<td></td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.991</td>
<td>0.998</td>
<td>0.996</td>
<td>0.999</td>
</tr>
<tr>
<td>D.W.</td>
<td>0.382</td>
<td>1.112</td>
<td>0.475</td>
<td>1.187</td>
</tr>
</tbody>
</table>

Note: *: statistically significant at 5% level
**: statistically significant at 1% level

Dummy(1974-) : dummy variable (after 1974=1, before 1973 = 0)
Dummy(1990-) : dummy variable (after 1990=1, before 1989 = 0)
Public Capital (1974-) : coefficient dummy (after 1974 = 1, others = 0)
Public Capital (1990-) : coefficient dummy (after 1990 = 1, others = 0)

Source: Yoshino, Nakajima, and Nakahigashi (1999) Table 2-4
Effectiveness of Public Capital Stock
- “Private capital/Public capital ratio” to “Marginal productivity of Public capital” -

Secondary Industry (Industrial Sector)
Determinants of regional allocation of public investment (Political Power plays a role)

Table 3: Allocation of Public Infrastructure in Japan: (Pooled data, 47 prefecture)

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Explanatory Variables</th>
<th>Agriculture</th>
<th>Land Conservation</th>
<th>Industrial Infrastructure</th>
<th>Improvement of living standards y</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha_0$</td>
<td>Constant</td>
<td>-35.44</td>
<td>-34.26</td>
<td>-61.58</td>
<td>52.32</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-10.46**)</td>
<td>(-11.32**)</td>
<td>(-11.84**)</td>
<td>(8.00**)</td>
</tr>
<tr>
<td>$\alpha_1$</td>
<td>Yp (Income)</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.036</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.21**)</td>
<td>(13.18**)</td>
<td>(17.99**)</td>
<td>(25.86**)</td>
</tr>
<tr>
<td>$\alpha_2$</td>
<td>Sp (AreaSize)</td>
<td>4970</td>
<td>2090</td>
<td>3855</td>
<td>2730</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(28.47**)</td>
<td>(13.40**)</td>
<td>(14.39**)</td>
<td>(8.10**)</td>
</tr>
<tr>
<td>$\alpha_3$</td>
<td>Rp (Political Power)</td>
<td>8280</td>
<td>7274</td>
<td>10956</td>
<td>-7434</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(16.88**)</td>
<td>(16.60**)</td>
<td>(14.55**)</td>
<td>(-7.85**)</td>
</tr>
<tr>
<td>$\alpha_4$</td>
<td>Dummy1</td>
<td>-23.21</td>
<td>-34.27</td>
<td>-59.81</td>
<td>-36.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(-6.69**)</td>
<td>(-11.06**)</td>
<td>(-11.23**)</td>
<td>(-5.50**)</td>
</tr>
<tr>
<td>$\alpha_5$</td>
<td>Dummy2</td>
<td>27.43</td>
<td>-1.65</td>
<td>65.87</td>
<td>66.89</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(9.26**)</td>
<td>(-0.62)</td>
<td>(14.48**)</td>
<td>(11.70**)</td>
</tr>
</tbody>
</table>

Adj. $R^2$          0.675           0.486           0.458           0.527

(1) ( ) denotes t-value

(2) ** is significant with 99.0% level,
Marginal Productivity of Public Capital, Japan (Production Function, 1956-1993)

<table>
<thead>
<tr>
<th>Year</th>
<th>1956-59</th>
<th>1960-64</th>
<th>1965-69</th>
<th>1970-74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Capital Stock</td>
<td>0.7558</td>
<td>0.7304</td>
<td>0.6463</td>
<td>0.4131</td>
</tr>
<tr>
<td>Public Capital Stock</td>
<td>0.6487</td>
<td>0.8016</td>
<td>0.8168</td>
<td>0.0842</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>1975-79</th>
<th>1980-84</th>
<th>1985-89</th>
<th>1990-93</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Capital Stock</td>
<td>0.3124</td>
<td>0.2578</td>
<td>0.2280</td>
<td>0.1995</td>
</tr>
<tr>
<td>Public Capital Stock</td>
<td>0.0397</td>
<td>0.0590</td>
<td>0.2525</td>
<td>0.2246</td>
</tr>
</tbody>
</table>

Note: This is estimated from the simultaneous regression of production function and labor share function. The estimation method refers to Yoshino, Nakajima and Nakahigashi (1999).

Reprinted from Yoshino, Nakajima and Nakahigashi (1999) Table 2-4
Marginal Productivity of Public Capital, Japan (Production Function, 1980-2004, Preliminary)

<table>
<thead>
<tr>
<th>Year</th>
<th>1980-84</th>
<th>1985-89</th>
<th>1990-94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Capital Stock</td>
<td>0.1587</td>
<td>0.1499</td>
<td>0.0658</td>
</tr>
<tr>
<td>Public Capital Stock</td>
<td>0.3100</td>
<td>0.2654</td>
<td>0.2189</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>1995-99</th>
<th>2000-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private Capital Stock</td>
<td>0.0633</td>
<td>0.1551</td>
</tr>
<tr>
<td>Public Capital Stock</td>
<td>0.1752</td>
<td>0.1615</td>
</tr>
</tbody>
</table>
Figure 5
Infrastructure Revenue Bond

High-Way Toll → Interest Payments And Principal Payment (70%)

Interest Payments And Principal Payment (70%)

Tax Payers’ Money (30%)

→ Private Investors

Govern ment
Figure 8, Rate of Return and the revenue bond
Figure 9, Convertible from Government Bond to Revenue Bond
Private Sector Green Trust Fund

(1) Brown Field
Construction by the government introduce private sector funds afterwards

(2) New Projects (Green filed)
Riskier
good to be based on market basis
Figure 6.2 - Revenue Bond Schemes in Asia

- Existing Infrastructure
  - Securitize 60% of Actual Revenue
    - Direct Payment
    - Internal Enhancement
      - Tax or Public Injection
  - Variable Rate Revenue Bond
    - Fixed Rate Revenue Bond
    - Bank Loan

- Transparency
  - Market Discipline
  - Step-in Rights

- INVESTORS
  - Market Attractiveness
Examples of Trust Funds by Internet in Japan; E-fund
1, Solar Power Panel
2, Japanese Sake (=Japanese wine) producers’ fund
3, Forest trust fund
4, Music trust fund
5, Wind Power Generator
6, Green Finance
Investors

Large Projects and Professional Investors
Pension Funds
Insurance companies
Mutual Funds

Community Type Infrastructure
Wind power Generator Funds
Japanese Wine Fund
### SMEs in Thailand

<table>
<thead>
<tr>
<th>Type of Enterprise</th>
<th>No. of Enterprises (% of total)</th>
<th>No. of employment (% of total)</th>
<th>GDP Mill. Baht (% of total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMEs</td>
<td>2,366,227 (99.6%)</td>
<td>8,900,567 (76.0%)</td>
<td>3,244,974 (38.2%)</td>
</tr>
<tr>
<td>Large Enterprise and Others</td>
<td>9,141 (0.4%)</td>
<td>2,810,767 (24.0%)</td>
<td>5,239,226 (61.8%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2,375,368 (100%)</td>
<td>11,711,334 (100%)</td>
<td>8,484,200 (100.0%)</td>
</tr>
</tbody>
</table>
SME JAPAN

Num of Employee SMEs
- Large Enterprises: 13,710 thousand (30.5%)
- SMEs: 29,960 thousand (70.2%)

Num of Companies
- Large Enterprises: 13 thousand (0.3%)
- SMEs: 4,690 thousand (99.7%)

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SMEs in China

(No. Red Mark is SMEs’ share)

- Number: 1%
  - SMEs: 99%
  - Large Enterprises: 1%

- Employment of urban area: 25%
  - SMEs: 75%
  - Large Enterprises: 25%

- Export: 38%
  - SMEs: 62%

- GDP: 44%
  - SMEs: 56%

- Tax: 57%
  - SMEs: 43%

Source: Department of SMEs, China National Development and Reform Commission, June, 2004
(1) Financial Position

<Tankan¹>

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

- Large enterprises
- Small enterprises

CY 90 92 94 96 98 00 02 04 06 08 09
Loan Supply Curve

SME versus Large Companies

Interest Rate

SME Loan Supply Curve

Large Companies

Loan Supply
Bank’s Profit Function

$$\Pi = r(L)XL - \rho(L,Z) xL - C(L)$$

Subject to Balance Sheet Condition ($L = D$)

→ First Order Condition

$$r = -r'(L)XL - \rho(L,Z)) - \rho'(l)XL - C'(L)$$

$$r = d1XL - \rho(L,Z) - \rho'(L,Z) xL - C'(L)$$

$$\frac{dr}{dL} = d1 - 2x\rho'(L,Z) - \rho''(L,Z) xL - C''(L)$$

$$\Pi = \text{Profits}, \ r(L) = \text{loan rate of interest}, \ L = \text{amount of bank loan}, \ D = \text{Deposit}$$

$$P = \text{Default ratio}, \ C(L) = \text{Cost function of bank}, \ Z = \text{CRD data}$$
Discussions

1. Long term financing to corporations
   Large corporations

2. Large companies can access to bond market

3. SMEs and venture businesses
   who will provide long term funds?

4. Evaluation of risks of SMEs

5. SME database, CRD in Japan

6. Regional mutual funds, E-funds
Bank based SME financing and Regional financing to Riskier Borrowers

1. Bank Loans to relatively safer borrowers
2. Regional mutual funds / Regional fund

E-Finance, E-Fund

Safer SMEs

Banking Account

Regional Funds Mutual Funds

Riskier Borrowers

Depositors

Investors
Separate Accounts of SME financing

1. Traditional Bank finance
   Private banks

2. SME fund, Regional mutual funds, E-Finance
   Sell these mutual funds through banks’ branch offices

3. Separating two accounts
   (i) Banking accounts (Guarantee by FDIC)
   (ii) SME funds, Regional mutual fund (non-guarantee)
**Basel Capital Requirements**

*Basel III*

1. Adequate Capital for Banks
2. To keep healthy
3. SME loans will decline
4. Micro credit
5. Loan sharks
6. Education to SMEs and borrowers

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
Credit Rating System

1, AAA, AA, BBB .............

Single Number

2, Various Characteristics needed to be focused on:

(i) Growth potential
(ii) Good Management
(iii) Technology etc.

3, Sudden Down-grading after Crisis
SME Data base (CRD Data base)

Credit Guarantee Corporations
(Collect Data of SMEs)

SMEs (14.4 million data)
 Defaults (1.7 million data)

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

CRD
1. Government Support
2. Reliability
3. Security of Information
Credit Rating for SMEs by Use of CRD Data

1. Credit Rating is only applicable to large companies
2. Credit Rating for SMEs based on CRD Data
3. Five ranking of SME (Japan’s case)
4. Credit Guarantee ratio is determined
5. CRD can obtain default risk ratio
6. Risk based Interest rate
Credit Rating of SMEs by Use of CRD Database

(i) Profitability capital earnings ratio
(ii) Efficiency
(iii) Productivity
(iv) Safety Liquidity ratio
(v) Growth Potential profit growth
Risk Based Interest Rate

(1) General Credit Risk

(2) Credit Cost Ratio

\[ \text{[Default ratio]} \times (1 - \text{recovery rate}) \]

(3) Costs = Personal and Equipment

(4) Interest rate to raise money

(5) Monitoring of SMEs by banks
Financial Education for SMEs

Education Program and Textbooks

1. Financial Planners Association
   Individual Borrowing

2. Central Bank of Japan
   Textbooks, Educate School teachers
   Regional Education Program

3. Various Financial Associations
   Bankers Association, Stock Exchange
Financial Planning for SMEs

(i) Education for SMEs
(ii) Japan’s Banks provided consultation services to SMEs
(iii) Financial Education for SMEs
   → Text book and Education training
   → Book Keeping
      → Data collection
Bankers and Micro credits have to provide honest service to SME borrowers

1, Association of Micro credit companies was established in 2009 in Japan. Education to money lenders (micro credit companies)

2, Self regulations by the Association

3, More than 50% joins the Association
Borrower, Lender and Market

Information Asymmetry
How much Borrowed?
Large Companies
Infra structure
SME
Venture Business
Gov. banks
Long term Credit Banks
Banks
SME banks
Micro credit
Venture Capital
Bond Market
Pension Funds & Insurance
References


OECD (2010), Southeast Asian Economic Outlook, Fall 2010, Chapter 6 (Yoshino)