



Fiscal Stability, the Infrastructure Revenue Bonds and Bank Based Infrastructure Funds for Asia

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Abstract or Introduction?

This paper addresses various financing methods for infrastructure investments. The evaluation of the efficiency and performance of infrastructure investments is an important element. The proposed financing methods will reveal the superior performance of the infrastructure investment and improve the efficiency of infrastructure investments.

The use of infrastructure revenue bonds (IRB) for the development of transport in the Asian region is explained in this paper. Revenue bonds (RB) are used in the USA and they are attractive to investors due to their tax advantage. However, the proposed infrastructure revenue bonds combined with a viability fund is different from the revenue bonds currently used in the USA.

Basic infrastructure to mobilize resources and transport products is essential to economic development. Production sites require easy access to highways and other means of transport so as to make employees and products easily mobile from one place to another.

Public-private partnerships (i.e. infrastructure revenue bonds with a viability fund) are an ideal applicant for the construction and maintenance of transport infrastructure, since transportation infrastructure such as highways, railways, busses, subways etc. have fee revenues from their daily operations.

The proposed infrastructure revenue bonds combined with a viability fund are suitable to finance the construction of transport infrastructures and their maintenance after the completion of construction. (However, revenue bonds for infrastructure investments do not necessarily get enough revenue to pay interest or dividends to private investors.) However, the revenue from infrastructure investments is not always sufficient to pay attractive interest rates or dividends to investors in revenue bonds. Then, a viability fund is required.

Public transport shows positive externalities. Once public transport is constructed, the number of automobiles used for commuting purposes will diminish and be substituted for public transportation. This will reduce CO₂ and other emissions. Transport infrastructure will bring employment into the region by encouraging firms to move to the region and enhance tax revenue in the region.

Many growing Asian countries require huge amounts of infrastructure investment such as highways, bridges, ports, trains, etc. However, these countries do not have enough money to finance all the infrastructure investments that are needed. Infrastructure investments are often determined by political power, without attention to efficiency. The allocation of infrastructure investment is regionally distorted by political power. Efficient infrastructure investments that support economic growth, essential to East Asian countries, and the

proposed financing methods will make infrastructure investment choices more efficient than previously.

However, IRB must also be cautiously introduced because the construction of infrastructures using private sector money will create future risks for investors. The new proposal of IRB combined with a viability fund addressed in this paper will mitigate the risk of investing in infrastructure.

The Asian financial markets are dominated by the banking sector. It is not easy to finance long term infrastructure projects through bank financing since it is based on deposits. The BIS capital requirement rules require banks to keep enough capital, making it difficult for banks to provide long term loans. Regional infrastructure funds sold through bank branch offices could enhance long term funds for Asian people.

Section 1: Source of Financing for Infrastructure investments

Infrastructure construction can be financed by the following four methods:

- (i) Tax revenues
- (ii) Postal Savings or National savings which are then used to provide loans through government financial institutions.
- (iii) Government bonds
- (iv) A Public-Private Partnership through Infrastructure Revenue Bonds

The first method is funded by tax payers' money. Namely, government spending is used to finance infrastructure investment and the source of funds comes from tax payers' money.

The second method is to use the government lending facilities. One example is financing through government financial institutions such as government banks (e.g. the Fiscal Investment and Loan Program) or utilize the funds collected by national savings banks (or postal savings).

The third is to issue government bonds to construct infrastructures.

The fourth method utilizes both public money and private sector money (i.e. a Public-Private-Partnership).

The various methods of financing infrastructure investments are compared below.

(1-1) Tax Payers Money, its benefits and deficiencies

One way to finance infrastructure investment is to use tax revenues. The government utilizes its general budget for infrastructure investment. If the general budget financed through tax revenue is used for infrastructure investments, the allocation of money into hard infrastructure is politically determined by the national government. The general budget expenditures and the allocation of the budget have to go through the diet. In this case, the allocation of the budget to infrastructure investment depends on political power. What kind of infrastructure investments get priority and in which regions infrastructures are constructed are all political decisions. Moreover, some emerging economies are faced with a low rate of tax collection and there may be loopholes in the tax collection system. Thus, many emerging economies do not have enough tax revenues to finance their needs in infrastructure.

Distortions in budget allocation may cause an inefficient allocation of capital in emerging economies. Politicians in power tend to favor the construction of infrastructures in their own constituencies to benefit their voters rather than making decisions based on economic priorities.

The benefit of using tax payers' money is the stability of funding for infrastructure investments.

(1-2) Use of National Savings such as Postal savings to finance infrastructure investment

Emerging economies in Asia show very high savings' ratios as shown in Table 1. It would be possible to direct some portion of the accumulated high savings towards infrastructure investment. However, these savings do not circulate much amongst Asian countries.

Table 1, Asia's Savings Rate (%)

Table 1 - Asia's Gross Domestic Saving (per cent of GDP)

Selected Economies	1990	1995	2000	2005	2009
China	35.2	39.6	38.0	46.4	51.2
Chinese Taipei	28.7	28.2	27.8	27.1	26.3
Hong Kong, China	35.7	29.6	31.9	33.0	29.7
India	22.8	24.4	23.7	33.1	30.4
Indonesia	32.3	30.6	31.8	27.5	31.8
Korea	37.6	36.5	33.3	32.3	29.7
Malaysia	34.4	39.7	46.1	42.8	36.0
Philippines	18.7	14.5	17.3	21.0	15.6
Singapore	45.1	50.0	46.0	49.4	48.3
Thailand	34.0	36.9	32.5	30.9	31.7
Viet Nam	2.9	18.2	27.1	30.3	27.2

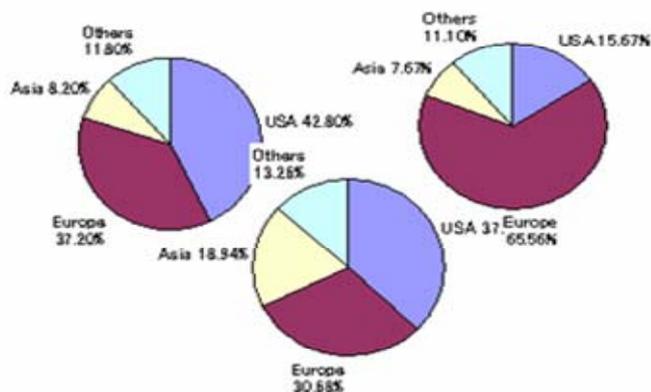
Source: Asian Development Bank, Key Indicators 2010

The accumulated savings are invested in domestic deposits, domestic stocks, and overseas government bonds such as US treasury securities. Figure 1 shows three pie charts. The left chart shows where Asians' are investing. 42.8% of Asian savings are invested in US securities and stocks. 37.2% are invested in European financial instruments. Only 8.2% are invested in the Asian region. Asian investments tend to be long term oriented such as long term government securities. On the other hand, the middle pie chart of Figure 2 shows that 37% of money invested in Asia comes from the USA and 30% from Europe. These funds are short term oriented. Only 18% of funds come from Asia. Asia's high savings are directed towards the USA and Europe for long term investment. The portfolio investments that come from overseas are short term in nature and unstable. It was one of the causes of the 1997 Asian financial crisis. Moreover, the situation has not improved since then.

Figure 2 - Direction of Portfolio Investment from Asia and into Asia

Direction of Portfolio Investment

Figure 1, From Asia, Figure 2, To Asia, Figure 3, Europe



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29

8

The right hand pie chart in Figure 1 shows the case of Europe. 65% of funds are circulated among European countries.

If these domestically collected savings were used for infrastructure investments, the amount of savings would be enough to finance infrastructure needs in the Asian region. Infrastructure investments are long term oriented and the economic growth expected in many emerging South East Asian economies would produce higher yields for investors in the region. Long term investments in infrastructure would match the time frame of Pension funds and insurance investments, which are both expected to grow in East Asia.

However, the allocation of national savings to infrastructure investments often lacks transparency. Certain infrastructure investments are made in regions where political power is strong. Or unnecessary infrastructures are constructed for political reasons. The reason for such distortions in infrastructure investment comes from the non-transparency of decision making and the lack of ex-post performance appraisal of the infrastructure.

Infrastructure investments financed by public-private partnerships through revenue bonds with a viability fund proposed in this paper will reveal the performance of the infrastructure investment judged by their rate of return. If a sufficiently high interest rate cannot be paid to the investors, it is possible for the government to guarantee a minimum rate of return, as

discussed in section 1.2. A soft budget constraint has often been observed in the case of government loans because of the lack of transparency of the rate of return on infrastructure investments.

In order to avoid the deficiencies of a soft budget, the reasons why the specific infrastructure is chosen for construction must be disclosed. Its' expected rate of return and the ex-post rate of return have to be revealed to the public.

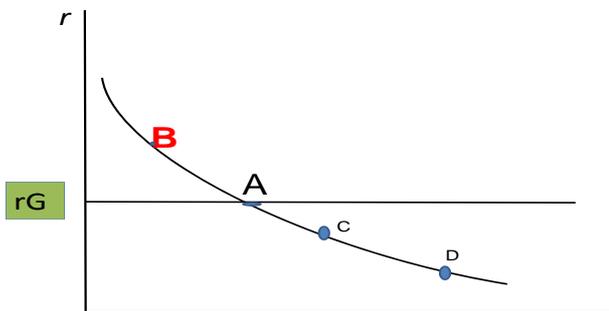
Infrastructure revenue bonds make the ex-post performance available to the public. Even if national savings are used for infrastructure investments through the purchase of infrastructure revenue bonds (IRB) as proposed in this paper, the rate of return on IRB is determined by the performance of the infrastructure.

Suppose the road constructed will have a very high usage rate by cars and trucks, the rate of return of IRB will be very high. Investors can compare various IRBs and can watch their performances. If one toll highway does not run well and its rate of return is lower than originally expected, there will be pressure from the IRB investors asking why the rate of return is low. The management of the infrastructure may be bad and there will be pressure from the investors to improve its usage in order to raise its rate of return. Transparency of the rate of return of each road will put pressure to improve the management of the toll highway corporation of the country.

The selection of infrastructure investments in many countries is decided by the political power: should urban highways or inter-city highways be constructed first? or should roads in rural regions get priority? Should ports have priority over roads? These choices are not made by the markets but based on political decisions. However, IRB (Infrastructure Revenue Bonds) would give us the answer to what should take priority based on its expected future rate of return.

Figure 2: Rate of Return of an Infrastructure Investment and of the related Project Bond

Rate of Return and Project Bond

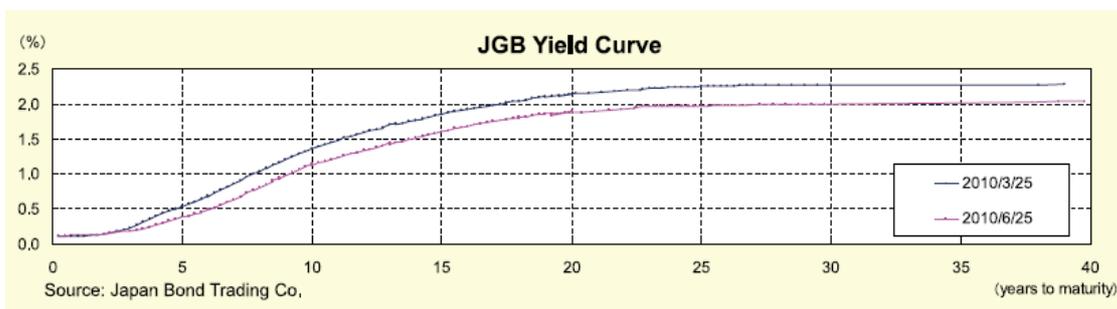


34

If the rate of return on an infrastructure investment is expected to be at point B where the expected rate of return is higher than the yield on the government bond denoted by r_G in Figure 2. Other expected rates of return on infrastructure investments are point C and point D, which are lower than the government bond yield of r_G . The priority is quite clear in this case. Private investors will want to invest in project A rather than in projects C or D. There is no need to rely on political decisions to set the priorities.

As is seen in Figure 2, the rate of return on government bonds will become a benchmark for infrastructure bonds, corporate bonds, etc. If the yield curve of government bonds can be constructed from the short term to the long term (such in Figure 3, in the case of Japan), the rate of return for an infrastructure bond can easily be estimated based on (i) the maturity of the infrastructure bond, (ii) the rate of return on government bonds with the same maturity, (iii) various risks and liquidity risks.

Figure 3: Yield Curve of the government bond as a benchmark



(1-3) Issue of government bonds to finance infrastructure investments

Finance in Asia is dominated by the banking sector and the bond market is not well developed. If the government wants to finance infrastructure by issuing government bonds, the maturity of the bonds has to be long term so that it will match the infrastructure needs.

When the infrastructure is financed by issuing government bonds, the rate of return on the infrastructure is not important. Whatever the type of infrastructure, the government will pay the same interest rate to bond investors. Suppose there are four projects as are shown in Figure 4. Whatever the rate of return on the infrastructure investment, the financing cost when using government bonds is the same and it cannot disclose the performance of the infrastructure investment. The priorities for infrastructure investments entirely depend on the political process, with no transparency.

(1-4) Private-Public Partnerships (PPP)

1-4-1, Proposal for infrastructure revenue bonds (or Public-Private Partnerships)

Public-Private partnerships will lead to improved transparency of infrastructure investments. Interest payments (or dividends) are based on the degree of use of each infrastructure. If it is used quite heavily, the fees from the infrastructure rise and the interest payments (or dividends) for private investors will rise. The performance of each infrastructure investment can be seen from the interest rate (or dividends) which private investors receive. If the infrastructure investment itself does not provide enough revenue for private investors, the public sector will have to inject money at the beginning to make the infrastructure project viable.

1-4-2, Incentive mechanism for public employees

Figure 4 shows the prisoners' dilemma. It is important to create incentive mechanisms for public employees who are working for the transport authority. In Indonesia, for example, transport industries do not give any incentives for transport authority to increase their revenues since their salaries are fixed whatever performance each transport infrastructure makes. Figure 3 shows how to improve incentives for employees of the transport industry so as to work hard to increase profits. The first column denotes the return for the transport management-company and the second term denotes the revenue for the investors. If infrastructure revenue bonds were not used, the revenue for the employee at the transport management company is only 50A. Investors receive the interest rate of government bonds where 50 is the number of cars which use this highway. When the employees at the

transport management company work hard to raise the amount of traffic, the number of cars will increase from 50 to 100 and the employees' revenue for will increase from 50A to 100A. A denotes the rate of bonus paid to the employees at the transport management company. If the traffic to use the infrastructure increases, the investors rate of return will become 100B. If 100B is higher than the interest rate on government bonds as is shown in Figure 5, investors would choose to invest in this infrastructure project. The second column and second row give strong incentives to work hard to increase number of traffics which use the infrastructure (say from 50 to 100) and investors receive higher rate of return from the infrastructure revenue bond (100B) which is higher than the interest rate on government bond (r).

Therefore, the bonus payment system has to be introduced to public workers by PPP infrastructure project in order to provide incentives to the public employees at the transport management company.

Suggested change for this section:

In this section, we propose an incentive mechanism to avoid moral hazard problems in transport infrastructure projects. We consider two groups of players, a road management company and investors in road infrastructure. There are two methods of financing. In the first case, the 'normal' case, the government finances the new roads through government bonds. In the second case, new roads are financed using infrastructure revenue bonds, that is bonds whose revenue is linked to the rate of return on the infrastructure investment, which itself depends on traffic intensity. When government bonds are used, the return on investment is fixed, at r .

Figure 4: Prisoners' Dilemma and the creation of incentive mechanism

**To Create Incentive Mechanism
Indonesia, Transport Infrastructure
(To Avoid Moral Hazard Problem)**

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

1-4-3. Need for the introduction of a viability fund to make infrastructure projects work

Figure 5: Viability Fund for Infrastructure investment

**Project Bond (Revenue Bond)
for Infrastructure**

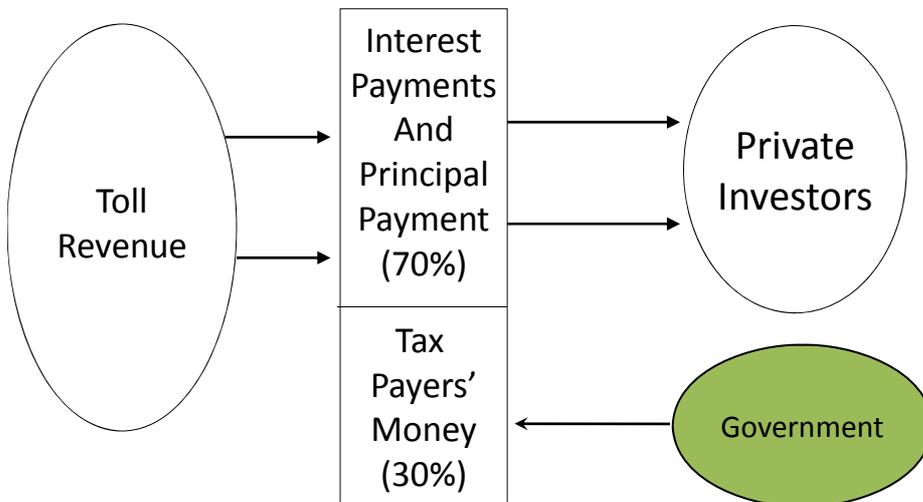


Figure 5 shows the needs for the injection of government funds at the beginning of the infrastructure investment. If the toll road is expected to have a large amount of traffic, government funds at the beginning would not be needed. The rate of return from the infrastructure would be like point B on Figure 2. The investors will receive enough revenue from their infrastructure investment. However, if it is not sure whether the rate of return will be higher than the interest rate on government bonds, the government will have to add a viability fund (in Figure 5) to make sure that the expected rate of return from the infrastructure investment is attractive. Public investment is justified by the fact that transport infrastructure has various positive externalities. The number of cars to be used for commuting will be diminished, which reduce exhausted CO₂ and other chemicals. The time cost of transportation will be cut if highways are constructed. These are regarded as positive externalities derived from the infrastructure investment. If these external effects are taken into account, the government should invest an amount at the beginning equivalent to the positive externality effects from the infrastructure investment. If the government injects money into the infrastructure investment up front, the rate of return from the infrastructure will be increased. Suppose the government puts 30% of money into the infrastructure project, the investors rate of return will increase by 10/7 (=1.428%). This will make infrastructure investments attractive to investors. However, the injection of public money has to be validated, otherwise easy injection by the government will be forced by political pressure. The externality effects of the infrastructure must be estimated in money terms and the government should inject the same amount into the infrastructure project.

Section 2: Infrastructure Project Financing in Asia: Financing gaps remain huge in Asia's infrastructure development

With the strong recovery of Asian countries from the global financial crisis, market participants expect that the infrastructure sector will become profitable enough to attract more private investments in the coming years. The region is facing huge demands for infrastructure investment. Table 6.3 reports the estimated need for national infrastructure investment in Southeast Asian countries as well as in China and India. On a per capita

basis, Asia's potential demand for national infrastructure investment would be between USD 2 000 to USD 3 000 on average over the period of 2010 to 2020.

Table 2 – Asia's Infrastructure Investment Needs* for 2010 – 20

Country	Total Estimated Investment Needs* (USD Billion)	Estimated Investment Needs per Capita (USD)
Cambodia	13	918
Indonesia	450	1,981
Laos	11	1,833
Malaysia	188	6,962
Myanmar	22	438
Philippines	127	1,407
Thailand	173	2,566
Viet Nam	110	1,273
ASEAN (8) average	1,095	2,172
China	4,368	3,297
India	2,173	1,906

* Energy, transport, telecommunications, water and sanitation;

Source: Bhattacharya (2010)

Asia's favourable medium-term growth prospects and the region's potential demand for developing basic infrastructure should attract both domestic and international investments/investors? from the private sector. Local debt markets to finance major infrastructure projects have been developing steadily over the past decade in several Asian countries, such as Indonesia, Malaysia and Thailand. However, these local markets have suffered from a narrow investors' base, limited rating capacity, restrictive legal and regulatory frameworks and the lack of benchmark yield curves with long-term maturity. Private-sector participation in infrastructure investment, therefore, remains very limited in Asia. For example, in the transport sector, private sector participation in financing transport infrastructure is particularly limited in Southeast Asian countries.

In order to attract more private investors in infrastructure project financing, it is critical to address the double mismatch problem. One mismatch concerns maturity, in that most long-term projects are financed by bank loans which are transformed from short-term deposits. The other is the currency mismatch resulting from the fact that project revenues are generated in local currency but financed in foreign currency. Moreover, exchange rate

fluctuations and limited convertibility of local currency imposes additional burdens on foreign investors and financiers.

To address the double mismatch problem, efforts have been made to develop local currency-denominated bond markets. A case in point is the ASEAN+3 Asian Bond Markets Initiative (ABMI). This initiative was endorsed at the ASEAN+3 Finance Ministers Meeting in August 2003 with the aim to develop efficient and liquid bond markets through more effective channelling of the region's abundant savings for Asia's investment needs. As seen in Figure 6.2, Asia's bond markets have expanded rapidly over the last ten years. The total outstanding of local currency bonds issued in Asian countries (excluding Japan) surged to USD 4 800 billion in June 2010, almost six times the level in 2000.

The Asian Bond Fund (ABF) Initiative is another important initiative started in June 2003 by the Executives' Meeting of East Asia-Pacific Central Banks (EMEAP)ⁱ to develop Asia's local currency bond markets. The ABF purchases government bonds issued in the region, with the aim to deepen and broaden the Asian bond markets for greater financial stability and integration.

The currency mismatch problem can be dealt with by applying multi-currency infrastructure financing. Supposing that private investors from the United States and Japan are willing to participate in a transport infrastructure project in Thailand; financing in this case will be arranged through the issuing of revenue bonds in the domestic currency (i.e. Thai baht), dollar-denominated revenue bonds, and yen-denominated revenue bonds. When the toll road is under construction, each country raises their funding from various currencies.

Multi-currency infrastructure revenue bonds provide an attractive scheme for PPPs involving both domestic and international investors. However, it should be noted that the toll revenue is received in Thai baht and must be converted to US dollars or Japanese yen to make interest (and principal) payments. Given the currency risks associated with this financing operation, the Thai government needs to issue both dollar and yen denominated government bonds in the market so as to absorb the dollar and the yen to pay back the infrastructure investment. The maturity of dollar and yen denominated government bonds should match the duration of the infrastructure revenue bonds. This would guarantee a minimum rate of return which is the rate of return on government bonds. In this way, the currency mismatch for overseas investors can be mitigated.

Table 3 - Examples of infrastructure funds

<i>Arranger</i>	<i>Major Fields</i>	<i>Size (US dollar)</i>
Macquarie Korea Infrastructure Fund Macquarie Shinhan Infrastructure Asset Management (MSIAM)	Toll roads, Tunnels, Bridges etc	964 million March 14, 2006
Alinda Capital Partners LLC	North America & Europe	1 billion
Infrastructure Development Finance Corporation	India Infrastructure Initiative	350-450 million
Carlyle Group	US	1 billion
MENA Infrastructure Fund Dubai International Capital and HSBC	The infrastructure sector such as in utilities, energy, transportation and public private partnerships across the Middle East and North Africa (MENA) region	500 million March 2006
Islamic Development Bank Infrastructure Fund Emerging Market Partnership (principal adviser)	Promote the use of Islamic finance in infrastructure development	730 million
Goldman Sachs International	Global Fund for Infrastructure	3 billion
KB Asset Management	J/V ING group and Korea Kookmin Bank Consortium of 17 domestic pension funds and insurance company investors	1.2 billion
Carlyle Group and Riverstone Holdings	Renewable Energy Infrastructure	685 million
GE and Credit Suisse	Infrastructure such as Power Plants, Pipeline, Airports, Railroads and toll roads	500 million

Source: Establishment of the Financial Architecture to Finance Infrastructure Investment in Asia, Working Group, Report, March 2010, METI (Ministry of Economy, Trade and Industry, Global Financial Mechanism)

More infrastructure funds should be established in Asia through the participation and co-operation of governments, financial authorities, government financial institutions and professional market players in the region. While the basic concept and the necessity of infrastructure funds in Asia has been clearly articulated, there are still many tasks remaining to be discussed with potential co-founding members.

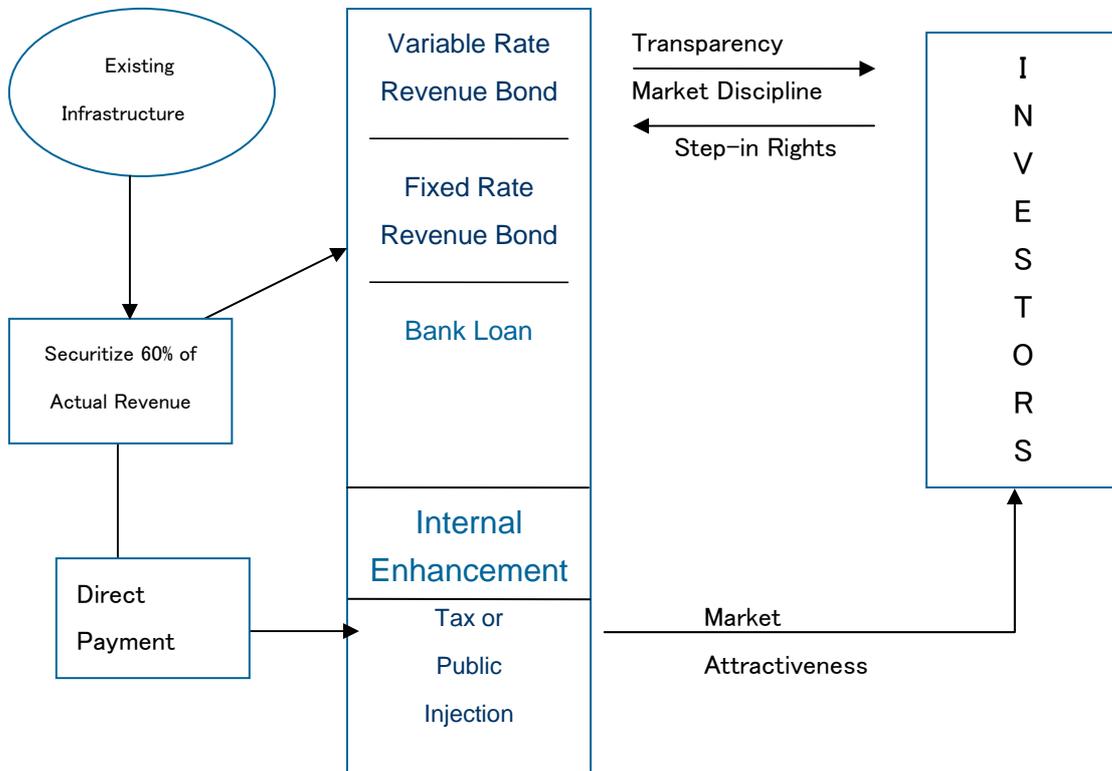
Section 3: Infrastructure revenue bonds to fill the financing gap

From the perspective of market discipline, it is important to have both variable-rate and fixed rate revenue bonds. The former can be linked to future cash flows generated by the projects themselves, with incentives given to operators to manage and operate efficiently. Variable-rate revenue bonds enable investors to monitor projects and retain step-in rights. Because it is very difficult to forecast future cash flows precisely, securitising existing infrastructures with established track records can help to issue fixed rate revenue bonds, which are attractive to institutional investors (see Figure 6).

(3-1) Imposing caps and floors to infrastructure revenue bonds

Variable-rate revenue bonds might be considered too risky due to the long-term nature and the political risks associated with large infrastructure projects. In order to mitigate the risks involved, the government can impose caps and floors as an option. If investors want to secure a minimum rate of return, the government can guarantee one. This rate can be set lower than the interest rate on government bonds with the same maturity. The market will inform the general public when the rate of return on the variable-rate revenue bonds becomes lower than the government bond yield (as illustrated in Figure 7).

Figure 6: Revenue Bond Schemes in Asia

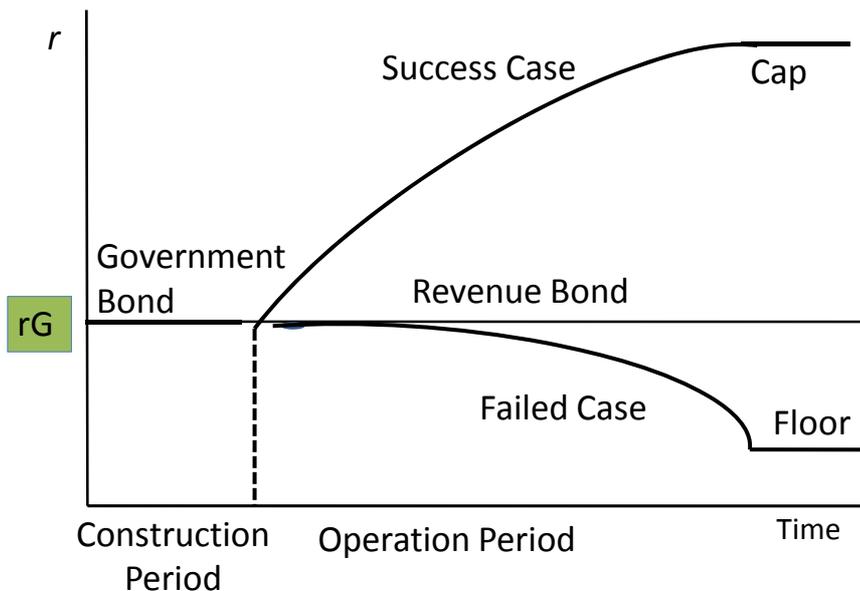


At the same time, the government can impose a cap on variable-rate revenue bonds. If investors want to secure a minimum rate of return, they must then give up the upward unexpected rate of return. If the infrastructure facility is successful with larger-than-expected traffic, the government will receive the revenues above the cap rate.

Infrastructure variable-rate bonds would pay the same interest rate as on government bonds during the construction period so that investors receive a continuous flow of interest payments on their investment. This will make it easier for mutual funds and other institutional investors to include the infrastructure variable-rate bonds into their investment portfolio.

Figure 7: Caps and floors for convertible infrastructure variable-rate bonds

Convertible from Government Bond to Project Bond



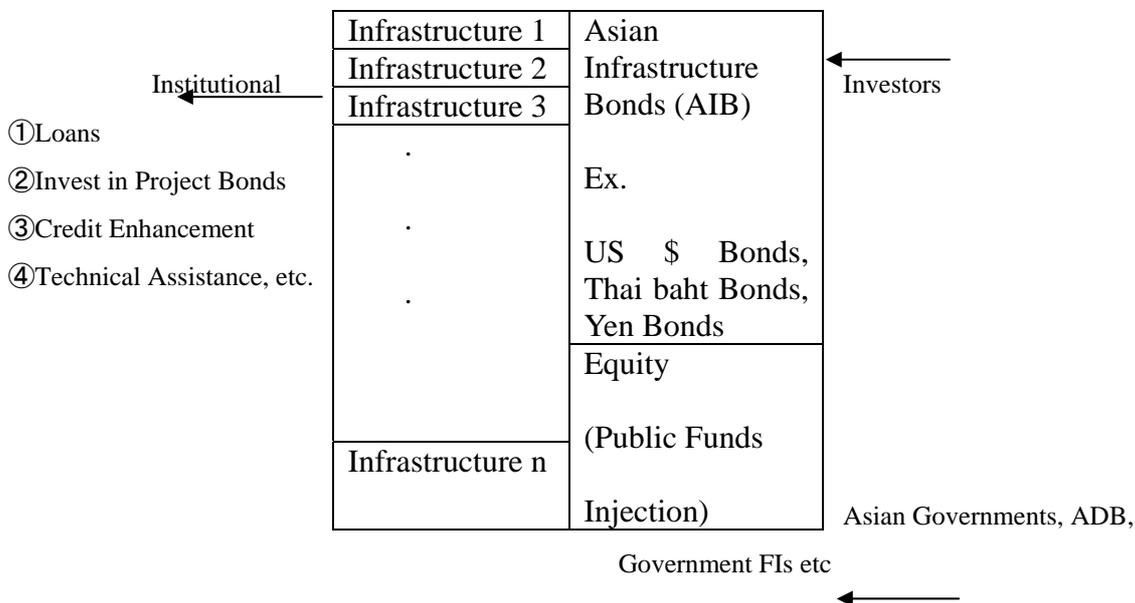
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(3-2) Infrastructure revenue bonds help to modernize Asia’s transport infrastructure services

Revenue bonds can be used to finance not only to new infrastructure projects but also to existing facilities (*i.e.* brown-field projects). Existing transport infrastructures generate daily income from direct toll and other revenues. These revenues can be securitized in the market as infrastructure revenue bonds. Then, the new money received by the government can be used to finance new infrastructure projects. Successful transport infrastructure projects can easily be securitized and attract various investors, both institutional and retail.

A key to success is that the revenues from infrastructure facilities must be clearly monitored. Otherwise, interest payments and dividends cannot be clearly set out for investors. The same principle applies to cross-border infrastructure. In such a case, two countries issue local currency-denominated revenue bonds to their investors separately, together with international investors.

Figure 8: Conceptual Structure of an Asian Infrastructure Bond Fund



Section : Bank-based Infrastructure financing

It is difficult for infrastructure investment and start-up companies to borrow money from banks. Many banks pay attention to companies' past record of business activities. If there is no record of borrowing from banks, banks are very reluctant to lend money without collateral (and personal guarantees).

Banks operate under the Basel capital requirements and have to keep enough capital to cope with default loan losses. In many countries, deposits are protected by deposit insurance and banks cannot be aggressive in their lending. See Yoshino and Hirano (2010).

How can infrastructure funds and SME funds (small and medium sized firms' funds) raise money? In some countries, family members and relatives provide start up money if they are lucky/able to. Some SMEs borrow money using micro credit, but have to pay higher interest rates than those practiced by banks. It is difficult to raise money from the market to finance infrastructure investments such as regional wind power plants.

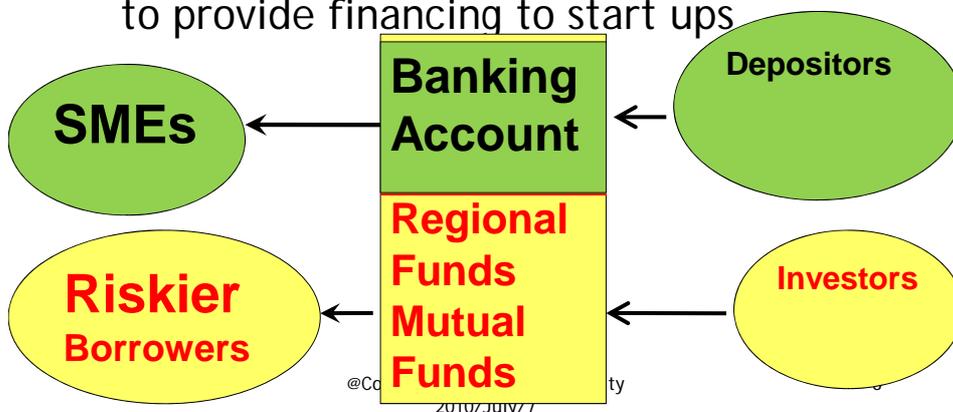
How then can we provide riskier money to regional infrastructure investments and SMEs?. Figure 9 shows a scheme of Bank-based provision of infrastructure mutual funds and infrastructure funds. Banks receive deposits and make loans to SMEs and large companies. Branch offices of banks not only receive deposits but also can provide mutual funds and infrastructure funds. Mutual funds and infrastructure funds are not guaranteed. However it can provide financing to start up SMEs in the region and infrastructure investment in each region.

Mutual funds and infrastructure funds are supplied not through ordinary banking accounts but they are supplied through separate accounts. The separation of the two accounts is important.

Figure 9: Bank based regional infrastructure financing

Bank based regional infrastructure financing and SME financing to Riskier Borrowers

- 1, Bank Loans to relatively safer borrowers
- 2, Regional mutual funds / Regional fund to provide financing to start ups



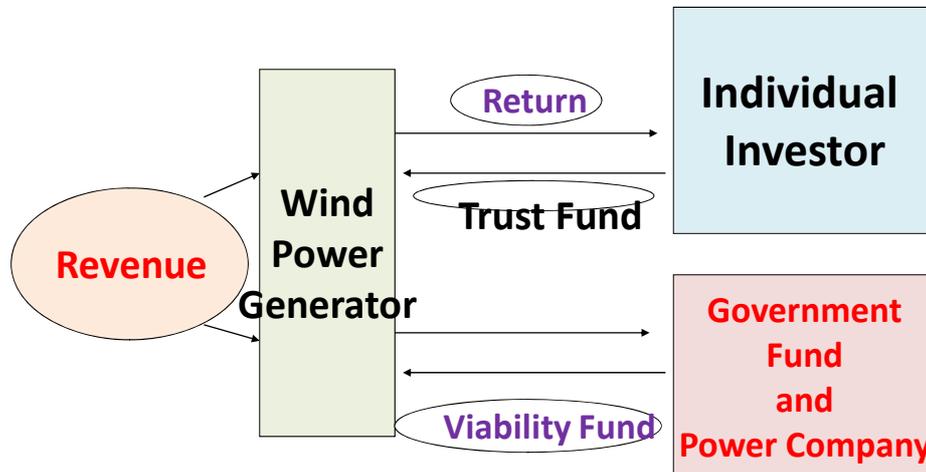
Section 5, Financing Local Infrastructure Projects

<Japan's example of Wind Power Generator by use of Private Sector Fund>

In Japan we have some experience about wind power generators which was raised by the private sector. I'd like to talk about the example. It has improved the transparency and efficiency.

Hamakaze Investment Fund

Wind Power Generator



3

Local government and local public electricity company have put viability fund at the beginning of the project (=wind power generator project) as is shown in the Figure. The individual investors are also investing in this wind power. They received dividends every month from the revenue of the wind power generator.

The local government and the power company have injected liability funds in order to make the rate of return from the window power generator to be matched with external effect by this project. When the wind power generator is constructed, it will reduce CO₂ and other exosion gas which will improve environment of the region. It is regarded as an externality effect of the wind power generator. If these externality effects are evaluated in economic value, the same amount of money can be injected into the project.

The viability funds will be injected at the beginning of the green project. It is injected only once and it will never be continued. Injection is only one time at the beginning. It means that there is no problem of the exit policy for the government. There were no subsidies once the project is started.

<Selling Mutual Funds for Green Investment through Banks>

Local project finance could be financed not by bank loans but by regional fund or regional mutual funds which will be sold through banks.

It is often discussed about “bank banking” in these days. However I propose some other financing method. Banks collect deposits and make loans. I would like to propose green funds or green trust funds which are shown at the bottom of Figure ? . They raise money from

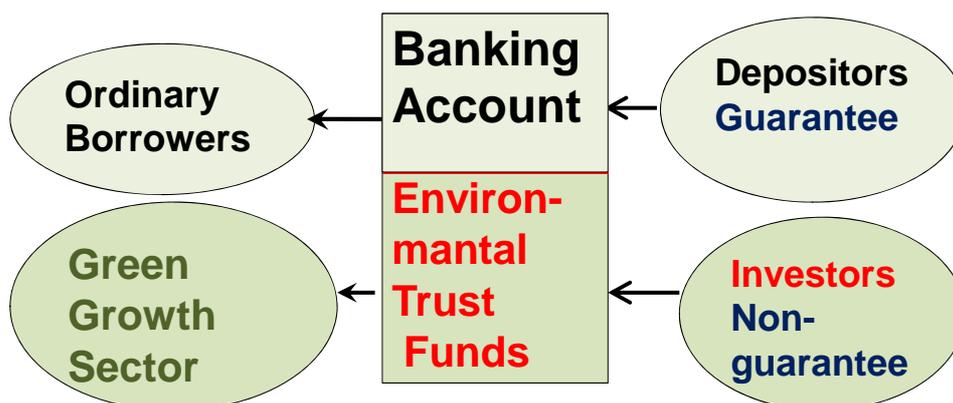
investors. It is not deposits and they are not guaranteed by the deposit insurance. The trust fund sold through banks, namely they are sold through branch offices of various banks. If you go to the bank, there will be two financial products: one is ordinary deposit and another one is green sector trust fund. In Japan currently trust funds are sold through banks and post offices. We set up the environmental trust funds and it is possible to sell those products through banks. However these green trust funds are not covered by deposit insurance and they are not guaranteed.

Bank based Green Growth financing and Regional financing to Environment

1, Bank Loans to ordinary borrowers

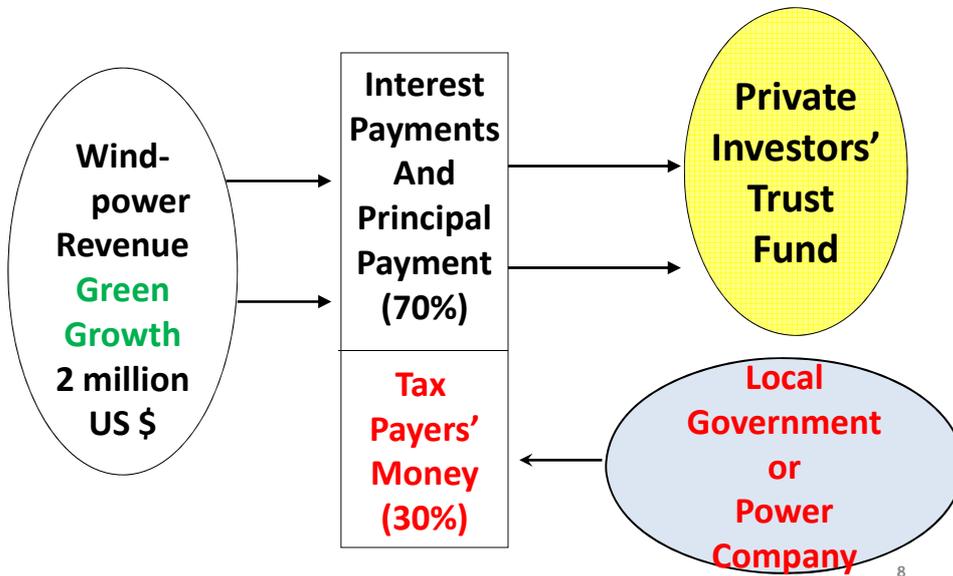
2, Regional mutual funds / Regional fund

to provide financing to environmental sectors



As for the Japanese cases of the wind power generator project, more than 20 power generators have been constructed in Japan. One construction costs 2 million US dollars. Each investor is a local individual. Minimum amount of trust investment is one thousand US dollars. So far in four years 400 US dollars had been returned. If this power generator goes well for ten years, all the return will be come back to the investors. First investors put some money; either one thousand or up to five thousands US dollar. Rate of return depends on the project by the project. Each year the dividends will come out by selling the power to the people

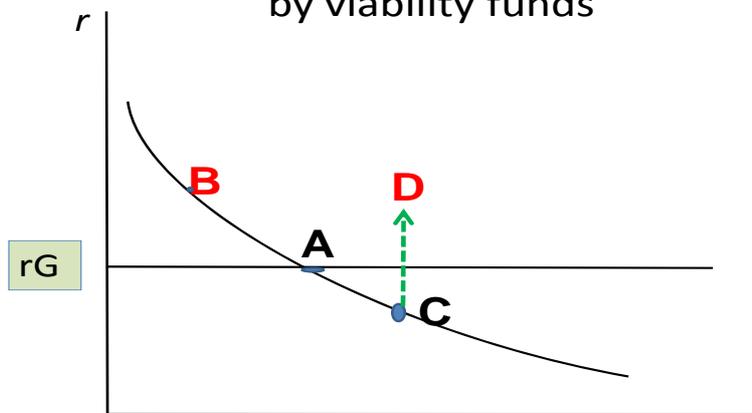
Wind Power Trust Fund



This example case shows that about 30% of money has been injected to the wind power project by the local government and the power company. Whether the thirty percent is appropriate or not is a question. This thirty percent will allow private investors receive reasonable amount of return. The government has put it thirty percent to secure the private investor rate of return.

The viability fund shown in the figure ? will enhance the vertical access rate of return. Suppose the rate of return is lower than the government bond rate. R_G is the government bond rate. Once the viability fund is injected, it can increase the rate of return for investors to from C to D. That is why the thirty percent viability fund is required to secure investors rate of return.

Rate of Return will be up graded by viability funds



12

Furthermore, these trust funds can be applied not only to the new project but also to the brown field which has been already constructed. The brown field project is much easier to apply investors' fund, because we know the rate of return and the revenues of the project on daily basis. One possibility is to start from the brown projects which are already operated and they are owned by the government. Then we can start to the new project by investors' green trust fund.

These funds can provide various projects which banks could not make loans.

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

16

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Conclusions

Transport infrastructure projects are inherently long-term which poses a number of problems for financing. The long lead time involved in such investments tends to discourage many potential investors. Moreover, economic and political uncertainties surrounding these projects often amplify the risk without a sufficient increased in the yield to compensate for this added risk. Southeast Asia lacks both a large base of regional institutional investors pursuing a long-term strategy and regional debt instruments with long-term maturity that can satisfy the needs of the region.

The private sector is unlikely to find most transport infrastructure projects in the region attractive enough to finance them entirely. Due to budget constraints, public funds cannot be expected to finance them either, although they could help mitigate the risks the private sector is unwilling to assume. This suggests that public-private partnerships (PPPs) should provide a range of viable options, notably through a revenue bond scheme, both to construct new facilities and to maintain or improve existing facilities.

Variable-rate revenue bonds may need both floors and caps; the first essentially to reassure private investors as to future yields; and the second to guarantee an equitable

return to public finances on the assumed risk. Steps should be taken to ensure that publicly-funded projects are financially viable in themselves and that private investors do not expect the government to guarantee all their losses. Another important point is that planned projects should be subjected to a careful assessment of future returns. The combined use of variable-rate and fixed-rate revenue bonds can provide a promising avenue for dealing with the uncertainty of assessing future cash flows.

Infrastructure revenue bonds are not useful only for large-scale, high-profile projects but may be applied to financing smaller projects with equal success. The flexible nature of infrastructure revenue bonds is thus well suited for transport infrastructure development in Southeast Asia.
