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Sources of Infrastructure Finance

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1 Introduction

There is a need for large and continuing amounts of investment[1] in almost all areas of infrastructure in India. This includes transportation (roads, ports, railways, and airports), energy (generation and transmission), communications (cable, television, fiber, mobile and satellite) and agriculture (irrigation, processing and warehousing). The key issue is, while the need exists, how will these projects get financed.

In the past the government has been the sole financier of these projects and has often taken responsibility for implementation, operations and maintenance as well. There is a gradual recognition that this may not be best way to execute/finance these projects. This recognition is based on considerations such as:

1. ***Cost Efficiency***: privately implemented and managed projects are likely to have a better record of delivering services which are cheaper[2] and of a higher quality.[3] The India Infrastructure Report (2003) estimates that the Indian economy's growth rate would have been higher by about 2.5% if the delays and cost overruns in public sector projects had been managed efficiently.[4] The report goes on to state that the predominant cause for such delays / overruns was not under-funding of the projects, but arose, "on account of clearances, land acquisition problems, besides factors internal to the entity implementing the project".[5]

2. ***Equity Considerations***: since it is hard to argue that every infrastructure project uniformly benefits the entire population of the country, it may be more appropriate to impose user charges which recover the cost of providing these services directly from the user rather than from the country as a whole (the latter is the effect if the government builds the project from its own pool of resources). If users are to be charged a fair price then the project acquires a purely commercial character with the government then needing to play the role only of a facilitator.[6]

[1] Refer Mohan (2003) for a comprehensive review of the gaps in each sector and the estimated amounts of investments required.
[2] Morris (2003) has a more detailed discussion.
[3] The telecom sector is the most recent example of this.
[4] India Infrastructure Report 2003.
[5] India Infrastructure Report 2003.
[6] Given the public good nature of the investment and the potential existence of positive externalities the government may need to play this role.

3. ***Allocational Efficiency***: Since users are likely to pay for services that they need the most, private participation and risk-return management has the added benefit that scarce resources are automatically directed towards those areas where the need is the greatest.[7]

4. ***Fiscal Prudence***: Both at the centre and state levels, for a variety of reasons, there is a growing concern that the absolute and relative (to GDP and GSDP respectively) levels of fiscal deficit are high and that incurring higher levels of deficit to finance infrastructure projects is infeasible.[8]

Given the strength of these arguments, the government has made several attempts to create the preconditions for a sustainable and scaleable involvement of the private sector in the development of infrastructure within the country. These have included promotion of Development Finance Institutions (DFIs) such as the Industrial Development Bank of India (IDBI), Industrial Finance Corporation of India (IFCI) and The Industrial Credit and Investment Corporation of India (ICICI) and specialised entities such as the Power Finance Corporation (PFC), Infrastructure Development and Finance Corporation (IDFC), Urban Infrastructure Development Fund (UIDF) and Tamil Nadu Urban Infrastructure Development Fund (TNUDF). For a variety of reasons while each of the entities mentioned has added value to the system in its own unique way, there is a concern that, in their current form, the DFIs no longer appear to be viable (being undercapitalised and unprof-

[7] As reflected in the willingness and ability to pay. It is possible that in a few cases, as in the provision of infrastructure to support primary schooling in rural and urban areas, there may be willingness but not the ability to pay (because of abject poverty). Here there may be a continuing case for the government to pay through the use of devices such as shadow tolls / fees or in the extreme case to exclude the private sector altogether.

[8] It is not clear however that a fiscal deficit level of 10% of GDP (combined for the state governments and the central government) is necessarily high and unsustainable for the Indian economy. It is possible that a great deal of the growth impetus in the Chinese economy has been the result of the willingness of the Chinese government to run a larger quantum of fiscal deficit (largely indirectly through the state owned banks financing state owned enterprises). Even within India it is possible that a rigid interpretation of fiscal deficit norms can be counterproductive. If fiscal prudence is taken to its extreme, a reduction in deficit can lead to reduced economic activity, future outlays and revenue. For an economy like India, operating below full employment, greater government expenditure could 'crowd in' private investment and also help boost aggregate demand. Government, by being the provider of risk capital may be able to stimulate private sector participation in key sectors and therefore, additional resource flows. Studying linkages between government and private expenditure in Australia, Kearney, Chowdhury and Fallick (1994) found that in Australia for every US$ 1 of public investment there has been an equivalent amount of private investment crowd in. Also, Aschauer (1989) has argued that a decline in public capital accumulation in core areas explains large part of productivity slowdown in US in 1970s. Benefits of measures like universalising education, while necessitating certain upfront expenditure, will yield benefits in terms of a skilled human resource base over a period of time. However, if this expenditure is reduced in the name of fiscal prudence, it is possible that the benefits from an entire generation of Indians may be lost. Therefore, a growth consistent path for an economy like India's may call for a reduced emphasis on deficit elimination without losing sight of the need for efficient utilisation of resources.

itable) and the specialised vehicles are not growing fast enough and may not provide a complete answer to the problem.

However, while there are certainly issues surrounding the availability of suitable intermediaries with an adequate amount of risk capital for infrastructure financing, there does not appear to be a shortage of funds per se within the economy. This situation of adequate supply of liquidity is of a relatively recent origin (and is apparently not restricted only to India) and appears to be the result of the manner in which the Reserve Bank of India (RBI) is managing the macroeconomy (specifically domestic interest rates and exchange rates), the sluggish demand for funds from both manufacturing and agriculture sectors and the continuing high propensity to save amongst Indians with a preference for long-maturity investments. Individual Indians have shown a great deal of willingness to save and hold those savings in very long-term assets either as deep-discount bonds,[9] savings linked insurance policies, savings bank accounts;[10] post-office savings and pension funds. Indian individual investor appears to be highly risk averse and is prepared to accept even very large negative real returns by holding large amounts of risk-free investments[11] rather than supplying risk capital that will earn higher returns.

Thus, for infrastructure finance, while the aggregate supply of funds does not appear to be a problem, there is a need for a layer of credit enhancement, which can absorb the risks associated with such financing. There is also a need for intermediaries, instruments and markets that can perform the functions of risk, maturity and duration transformation to suit the desires of the investors.[12] While Foreign Direct Investment (FDI) has the potential to provide some of the equity capital, it appears very likely that the Government

[9]Due to tax breaks and declining interest rates, infrastructure bonds have been emerging as a key source (contributing to around 16.0% of infrastructure financing in 2003) - Infrastructure finance report of ICICI Securities - September 2003.

[10]While savings accounts balances are withdrawal at demand, in practice, savings account balances have only increased in total quantum and represent the single largest source of funds for banks. If a bank uses inter-bank operations to manage day-to-day liquidity, it should in effect be able to treat savings account balances as very long-term funds.

[11]In the past, interest rates on the savings accounts have been more than 8.0% to 9.0% points below the 10 year Government of India Security yields. However, that has not diminished the ardor of Indian investors for the savings account. Even banks that have, on occasion had negative capital adequacy, have seen on those very same occasions, a very significant growth in their savings account balances.

[12]This was also commented upon by RBI in its annual report for year 2002-03 - "The experience since the late 1990s suggests that a key prerequisite for the evolution of institutional arrangements for infrastructure financing is the development of the capital market. The central issue is not the adequacy of funds but the convergence of investment horizons of ultimate savers and borrowers in the economy. This, in turn, warrants intensifying reforms in insurance and pension funds which provide a natural hedge for the risks inherent in the financing of infrastructure."

itself would have to emerge as the provider of the bulk of this risk capital with banks and capital markets providing the bulk of the debt finance. In the past the Government has tried to combine the role of provider of this risk capital and debt funds within integrated development banks but for a variety of reasons, this approach has not met with much success.[13] There is therefore an urgent need to examine the evidence at hand and attempt to discover new ways of addressing the problems that appear to be retarding the pace at which infrastructure investment is progressing.

2 Characteristics of Infrastructure Finance

Infrastructure projects differ in some very significant ways from manufacturing projects and expansion and modernisation projects undertaken by companies.

1. ***Longer Maturity***: Infrastructure finance tends to have maturities between 5 years to 40 years. This reflects both the length of the construction period and the life of the underlying asset that is created. A hydro-electric power project for example may take as long as 5 years to construct but once constructed could have a life of as long as 100 years, or longer.

2. ***Larger Amounts***: While there could be several exceptions to this rule, a meaningful sized infrastructure project could cost a great deal of money. For example a kilometer of road or a mega-watt of power could cost as much as US$ 1.0 mn and consequently amounts of US$ 200.0 to US$ 250.0 mn (Rs.9.00 bn to Rs.12.00 bn) could be required per project.

3. ***Higher Risk***: Since large amounts are typically invested for long periods of time

[13]Other countries such as South Korea, China and Japan have been both willing and encouraging these entities to build up a large quantum of Non-Performing Assets (NPAs) to suit their objectives. In April 2004, Mr. Zhou Xiaochuan, Governor of the People's Bank of China, quoted from a survey conducted by the Chinese Central Bank, "Concretely speaking, of the total NPLs by state-owned commercial banks, 30 percent was due to intervention by the central and local governments, 30 percent resulted from mandatory credit support to stateowned enterprises, 10 percent arose from poor legal environment and weak law enforcement in some regions, and 10 percent stemmed from industrial restructuring in some enterprises (including those in the military industry) by the government through closing down, suspending operation, merging with others or shifting to different line of production. All in all, only 20 percent was ascribed to business operation and management of the state-owned banks themselves." The Chinese banks have been subsequently allowed to write off their bad loans repeatedly by actively capitalising the banks. This is evident by the USD 32 billion and USD 45 billion capital infusions in the state held Chinese banks in 1998 and late 2003 respectively. However, within India, this approach has not found much favour.

it is not surprising that the underlying risks are also quite high. The risks arise from a variety of factors including demand uncertainty,[14] environmental surprises,[15] technological obsolescence (in some industries such as telecommunications) and very importantly, political and policy related uncertainties.

4. ***Fixed and Low (but positive) Real Returns***: Given the importance of these investments and the cascading effect higher pricing here could have on the rest of the economy, annual returns here are often near zero in real terms.[16] However, once again as in the case of demand, while real returns could be near zero they are unlikely to be negative for extended periods of time (which need not be the case for manufactured goods.[17]) Returns here need to be measured in real terms because often the revenue streams of the project are a function of the underlying rate of inflation.

3 Types of Risk Capital Required

There are two types of risk capital that are deployed in any project:

1. ***Explicit Capital***: this is typically the equity that a developer or a sponsor commits to the project. Here while the downside is unlimited (to the full extent of the amount of money the sponsor has committed to the project), if the project does well, there is no limit on the upside either. The sponsor seeks to conserve his capital and maximise the returns on it by deploying unique and project specific skills and by

[14]This is primarily due to the fact that the underlying good or service that is being provided has demand derived from the overall level of economic activity in the country which in turn is dependent on a variety of exogenous domestic and international factors (including domestic rate of growth overall or the rate and nature of growth of the region which the specific project is designed to serve and the inflation rate.) The uncertainty is both in terms of total quantum of demand as well as in terms of timing of demand (often compounded by the fact that in several situations the customers are being asked to pay for the service for the first time in their lives as in the case of toll roads.) However, it is important to note that unlike in the case of manufactured goods where demand and price realisation could both simultaneously be zero, in the case of infrastructure finance it is often possible to predict base demand with a high degree of certainty associated with each price level.

[15]For example hydrology risk in Hydro-electric Power projects.

[16]Gray and Irwin (2003) argue [square brackets added by the authors], in the context of exchange rate risk being borne by infrastructure projects, that any attempts by for example, independent power producers to pass on increased costs [or higher real returns] to governments or consumers simply transforms the exchange rate risk [or the desire for higher real returns] into political or regulatory risk as state owned utilities refuse to honour their obligations under the power purchase contracts.

[17]It is this characteristic of the infrastructure project that allows it to provide adequate return to its shareholders through a very high degree of leverage. However, if the level of risk is too high then the project cannot be leveraged adequately and, thus, fails to provide the equity holder with adequate return.

managing the underlying risks associated with the project. Given a limited supply of capital, the promoter also tends to concentrate his energies and capital in a small number of relatively lumpy investments so that he does not spread himself and his resources too thinly. In a typical infrastructure project, the developer puts together a consortium of capital providers who not only commit capital to the overall project but also assume complete operational and financial responsibility for specific risks (such as engineering, procurement and construction; operations and maintenance; and fuel supply), thus, lowering the capital requirements from the developer.

2. ***Implicit Capital***: this is typically the risk capital (in the form of economic capital or tier 1/2 capital adequacy) that is committed by a lender to the project. Loans have the characteristic that while the downside is unlimited (i.e., to the full extent of the amount lent - as in case of equity/explicit capital but with the cushion of the explicit capital), the upside is limited to the rate of interest charged on the loan. Secondly, the loans typically involve much larger amounts of money relative to the equity investments. Given the fact that a typical lender raises money from retail deposits (or bond holders) he needs to hold a reasonably high amount of capital to assure his depositors that irrespective of the fate of the project, he will be able to meet his obligations. Assuming that the desired rating aspiration for the lender is AAA (i.e., the lender would like to assure its depositors of a near zero default risk) an unsecured loan to a typical ten year infrastructure project (rated, say A-, with an average maturity of six years) could require as much as 25% tier 1 capital to be committed to it. Since the capital is required to cover the lender against all the uncertainties surrounding a specific project, the lender seeks to reduce the amount of capital deployed by diversifying across projects (unlike the promoter who seeks to specialise and concentrate his exposure) and by ensuring that to the extent possible, the explicit capital (brought in by the promoter) is sufficient to cover the risks beyond the worst-case scenarios. The lender seeks to be compensated for this capital through the rate of interest charged on the project loan.[18] Given the relatively

[18]Broadly speaking the rate of interest is the sum of the cost of funds of the lender, the expected losses on this type of project loans, the return on equity for the tier 1 capital allocated to the project loan and the costs associated with appraising and monitoring the loan. See "RAROC - A performance measurement tool" by Jammi Rao and Kalpana Prabhu at www.ICICIresearchcentre.org for a more detailed treatment of this issue.

large amounts of funds required for each project and the comparatively smaller number of such providers, lenders in the past have typically not had the opportunity to sufficiently diversify their risks[19] nor have they had a sufficient amount of tier 1 capital. Not unexpectedly, having held significantly less than the required amount of implicit capital, they have very quickly found themselves undercapitalised relative to the level of credit rating that they had committed to their depositors and in some cases have even defaulted to them.

The risk capital (explicit and implicit) required for infrastructure projects is the most scarce and, therefore, very expensive resource. Given the risks, amounts and maturities involved, required rates of return on such capital could well be excess of 25% to 30% per annum even in today's low interest rate environment. Given the large amounts of risk capital that could potentially be required this would have a significant impact on the cost[20] of the eventual service that is sought to be provided. In the past, the sources that have been tapped for this capital have included professional developers, manufacturers of equipment, contractors,[21] domestic and international equity investors (who have tended to supply primarily the implicit capital required by lenders) and in several cases the government itself (both central and state governments). While the supply of this capital from private sources seems extremely limited, the experience of the government in supplying this capital has not been a very happy one. Typically the entities to whom capital has been supplied by the government have not even been able to service their lenders properly leave alone providing a positive return on equity to the government. These include users of implicit capital (SEBs, irrigation bodies, warehousing corporations etc.) as well as explicit capital (entities like IFCI at central government level and various State Finance Corporations at local levels).

[19]The complete absence of credit derivatives and the increasingly difficult regulatory environment for the trading / transfer of credit risk have further exacerbated this problem within India.

[20]High cost of this risk capital can feedback to the project in a cascading cycle as the higher cost of resultant services may lead to a drop in demand therefore increasing the need for capital. Alternately, for services with inelastic demand, it could lead to very high prices and potentially disputes leading to repudiation of contracts if consumers decided that the prices are unacceptably high and that disputing the contract in courts of law is the most optimal response.

[21]Most recently, this is being attempted in the roads sector but has the danger of slowing down the process considerably because the ability of most Indian construction contractors to provide sufficient capital against all the uncertainties, which would allow them to access this finance at a reasonable rate from lenders, is extremely limited.

As has been argued earlier, once an adequate supply of total (explicit and implicit) capital is ensured, the supply of funds is not really a binding constraint. The whole question of 'Sources of Infrastructure Finance' then becomes a much narrower question of 'Sources of Risk Capital for Infrastructure Finance' in the first instance and then secondarily a question of the manner in which these funds may be intermediated from the providers to the borrowers.

This paper attempts to address these issues along four dimensions:

a) Reducing the amount of capital required by each project;

b) Increasing the supply of this capital;

c) Facilitating the flow of funds to this sector, and

d) Enhancing the role of banks as intermediaries.

4 Reducing the Amount of Required Risk Capital

As a first step, before looking for new sources of this risk capital, given its extreme scarcity and very high cost, every attempt needs to be made to limit the amount of capital that is required by ensuring the following:

1. ***Removal of the Effect of Controllable Uncertainties***: All controllable uncertainties (such as those imposed by unexpected changes in policy, tax rates and political considerations) are either eliminated or the government directly takes the financial responsibility for them[22] in a timely[23] manner. This has the effect of imposing a general tax on the entire country for these uncertainties and taking it away from individual projects. This is, of course, relatively easy to articulate but much harder to implement in a democratic polity where governments and their political compulsions change frequently but the importance of a stable, even if imperfect, policy environment cannot be overemphasized. Ease in contract administration and adherence to

[22]The World Bank is exploring a Partial Credit Guarantee program for exactly this purpose - it will effectively transfer the risk arising from any of these events from covered projects back to the central government. This is very different from full guarantees in terms of guaranteed returns on equity which effectively convert the developer's equity into fairly high priced debt and remove all incentives to reduce either the risks or the costs.

[23]Given the capital intensity of these projects, timeliness is very important because mere three to four month delays in effecting payments could substantially alter project viability.

these contracts by all entities including state entities is a good example of a controllable uncertainty that has the potential[24] to reduce the quantum of total capital required.

2. ***National Diversification Benefit***: Even though a developer may be implementing only a small project in a small command area, if the desire is to ensure that the cost of the service provided by it is benchmarked at a national level and does not vary a great deal from region to region, the benefit of national or state level diversification could be made available to each project.[25]

   From a lender's point of view, it should be possible to diversify away as many components of the risk as possible through the use of credit and equity derivatives. Credit derivatives and other related contracts have the effect of allowing the reduction of capital consumption through diversification without necessarily having to incur the costs of buying or selling the underlying credit exposure.

3. ***Global Diversification Benefit***: Several infrastructure projects involve exposure to global risks such as rainfall, temperature and fuel and other commodity prices. Permitting lender to access these markets directly or through brokers will allow them to reduce their exposure to many of these risks, thus once again, reducing their consumption of implicit capital.[26]

[24] India Infrastructure report 2003 comments most lucidly on this dimension, "In our society the economic rules, settlement procedures and governance structures have led to abysmally poor contract adherence on part of many entities including the state in several important dimensions. Hence the very idea of a long-term contract with the state is adjudged as risky. Markets, not trusting the contract adherence, would impose high costs on such finance and hence, Project Financing Institution ceteris paribus is likely to be a high cost option."

[25] Examples of this would include dedicated road funds which issue traffic guarantees (caps and floors) for each sub-segment relying on the state-wide or national diversification available to the fund (but not to the individual project) to reduce its own need for capital to support the guarantee. This concept could potentially be extended to airlines, base-load power and communications.

[26] Office of the Comptroller of Currency in USA has specifically recognized the role of derivatives as risk management tool for banks. Julie L. Williams, 1st Senior Deputy Comptroller of the Currency and Chief Counsel Office of the Comptroller of the Currency, in his speech before Risk USA 2003 Conference, Boston, Massachusetts on June 10, 2003, said that "...We have...recognized, in a variety of contexts, that commodity and commodity index derivatives are a modern form of traditional financial intermediation functions performed by banks...we have permitted national banks to engage in various commodity-linked transactions involving oil, gas, other hydrocarbons, and metals...the OCC has long recognized that using derivatives to hedge against the risks associated with bank permissible activities is an integral part of those permissible banking activities. We have determined that national banks may hedge bank permissible commodity derivative transactions with other commodity derivatives, such as futures, and swaps and options and other over-the-counter instruments, when conducted in a safe and sound manner as provided in OCC guidance." OCC's views confirm that the normal lending activities of any bank give rise to commodity exposures for the bank and that it should actively seek to manage these from a risk management perspective. However, Indian Banks are still not allowed to deal in commodities or commodity derivatives.

5 New Sources of Risk Capital

In terms of new sources of capital, in addition to convincing the existing set of capital providers to commit more capital by creating an enabling policy environment, the following ideas could be explored:

1. ***First Loss Default Guarantee Funds (FLDGs) created by the Government***:[27] This is a very important idea, particularly in a situation where the overall supply of funds is adequate but there is a constraint in the supply of total risk capital and the government is seeking to operate within its fiscal limits. As a concept it requires governments to (a) stop spending the money required for projects; (b) focus on eliminating the effects of uncertainties caused by it and (c) to the extent that uncertainties remain, provide risk capital in a manner that preserves the incentives of all the other players to act in a consistent manner. FLDGs seek to provide non-event specific partial credit guarantees to lenders (unlike the partial credit guarantee being explored by World Bank - refer earlier footnote), are limited to only a part of the loan (say 25.0%) and operates on a first loss basis (i.e., in case of 25.0% FLDG the first 25.0% of the loss would be absorbed by the Fund). This manner of providing capital is in many ways superior to recapitalising existing intermediaries or creating new ones with Government capital.

    - The corpus which supports the FLDGF may be invested in interest bearing government securities so that the corpus continues to grow and there is no net impact on the government deficit (i.e. is cash neutral). (Please refer to Annexure 1 for a detailed discussion on FLDG fund).
    - Unlike in the case of recapitalisation where the government capital becomes the primary or the sole risk capital being deployed, in the case of FLDGs even

[27] ICICI Bank has effectively used FLDG as a credit enhancement mechanism for its micro finance initiatives, creating a significant positive impact on the financing structures for micro finance portfolios of some of the leading MFIs in the country. ICICI Bank's model is based on securitization of their portfolios with an FLDG from the MFI. While being immensely popular with the MFIs, the structure is extremely critical for ICICI Bank also since it ensures the stake of the MFI in the performance of micro finance portfolio by providing direct incentives and disincentives in the form of FLDG cover.

Similarly, ICICI Bank's joint venture with Grameen Foundation, USA which is being set up with an intention to boost the growth of micro finance sector by making market issues of micro finance paper also plans to utilize FLDG cover as a by form of credit enhancement for the market issuance. FLDG to be provided by the joint venture would not only improve the rating of the micro finance paper, but also instill investor confidence in the sector, which has till recently been deprived of funding from the mainstream financial institution

if they are administered mechanically,[28] the government capital is secondary capital. The primary capital being deployed is the implicit capital supporting the balance 75.0% of the loan. The FLDG has the effect of reducing the total quantum of the implicit capital that is needed but not to zero. The belief is that in seeking to maximise the return even on a lower amount of implicit capital the lender would be equally diligent. And, it may also bring in smaller and more specialised providers of implicit capital and loan funds (since the need to diversify would go down).

- FLDG concept draws its value from the diversification benefits inherent in a larger number of projects. FLDG pool makes this diversification benefit available to the lenders by reducing the project risk borne by them. In the US markets, monoline insurance companies like the MBIA[29] provide such credit supports for urban local bodies and other borrowers.

2. ***Securitisation***: A large project loan could then be broken up into several smaller pieces which could then be bought by insurance companies, individuals, banks, pension funds, etc. each of whom would have other diversified investments. This would typically be done in conjunction with a FLDG of the sort described earlier so that the securitised instrument acquires an investment grade character and can be subscribed to even by highly (credit) risk-averse lenders. In addition, if well established, active trading of such paper has the effect of establishing a pricing benchmark for such project risk and if packaged along with other securities, could even produce a very high quality paper.[30] However, for this to happen at a large scale a great deal of facilitative legislation and incentive structures would have to be built.

[28] And there may be sound economic reasons to do so - better governance, lower transaction costs, etc.

[29] MBIA is a US based financial guarantee insurance company and is rated AAA by S&P. It has been providing triple A credit enhancement for municipal and structured debt obligations since 1974. It has enviable record of very low defaults even though it has guaranteed more than 35000 municipal and asset backed transactions with total value exceeding $ 1.5 trillion.

[30] "Lenders have had the opportunity to be considerably more diversified, and borrowers have become far less dependent on specific institutions for funds. A major contributor to the dispersion of risk has been the wideranging development of markets in the securitized commercial and residential mortgages, bank loans and credit card receivables. These markets have tailored risks associated with holding such assets to fit the preference of a wider universe of investors." *Alan Greenspan: at the Institute of International Finance, New York, April 2002.*

3. ***Creation of several very large intermediaries (capital bases in excess of US$ 5.0***[31] ***billion each)***: These intermediaries could then manage the risk within their own balance sheets either by diversifying across many activities[32] or across many projects.[33] Currently only two entities exist with such a large amount of capital: State Bank of India and Life Insurance Corporation. Going forward, there may be a need to facilitate the creation of more such entities through the merger of several smaller ones.[34] Creation of several dedicated but small intermediaries for this purpose has precisely the opposite effect. The intermediary is often undercapitalised to begin with and for each project needs to commit a larger amount of (implicit) capital than a larger, more diversified entity would need to. While this approach has the benefit that the supplier of funds and supplier of risk capital is now one entity, there is always a very valid concern that such an intermediary, given a wide variety of choices, may choose to stay away from infrastructure investments altogether or may choose not to build the relevant expertise focussing instead on a completely different area.

6 Facilitating the Flow of Funds

As discussed earlier, fortunately for India, while there is an acute scarcity of risk capital, there is no shortage of the long-maturity funds that are required for infrastructure finance. Individuals have shown a great deal of willingness to save and hold those savings in very long-term assets either as 25 year deep-discount bonds; very long-term savings linked insurance policies; savings bank accounts;[35] post-office savings and pension funds. However, the individual investor is very risk averse and even at very large negative real returns appears prepared to hold risk-free investments rather than risky ones. In addition even though there has historically been a great deal of uncertainty surround-

[31] For e.g. MBIA Insurance Corporation has a capital base of over USD 6.0 Billion.
[32] State Bank of India would be one such example.
[33] Life Insurance Corporation would be one example of this.
[34] The Government of Singapore successfully implemented this perhaps with a similar motivation.
[35] While savings accounts have the right of immediate and full withdrawal, in practice, despite an increase in the number of choices available to investors, savings account balances have only increased in total quantum and represent the single largest source of funds for banks. If a bank uses inter-bank operations to manage day-to-day liquidity, it should in effect be able to treat savings account balances as very long-term funds.

ing the rate of inflation within the Indian economy, the investor appears to show a great deal of affinity for deposits and investments which have a fixed nominal rate of return. Given the characteristics of infrastructure finance, while aggregate supply of funds does not appear to be a problem, there is a need for intermediaries and markets that are able to perform all the three functions of risk, maturity and duration transformation. Other sources of funds have traditionally been the government itself (central, state and urban local body) and multi-lateral institutions such as the World Bank and Asian Development Bank. Some of the steps that need to be taken to make the large supply of domestic funds more easily available to infrastructure projects include:

1. ***Redefine NDTL to include only cash or cash-like instruments***:[36] Currently Net Demand and Time Liabilities (NDTL) are defined to include almost all the liabilities of a bank. The definition is important because under the Banking Regulation Act, SLR and CRR are defined with reference to NDTL. SLR and CRR obligations impose a financial cost on the bank but are important[37] where a bank is performing a maturity transformation role (as in the case of savings deposits which may potentially be withdrawn on demand). However, where a bank is mobilising fixed maturity deposits or bonds, particularly where the original maturities are greater than one year, it is not clear why CRR and SLR would be required to be maintained. One of the rationales for the continuance of specialised DFIs for infrastructure finance has been they are able to issue long-term bonds at low spreads over the G-Sec rate and do not have to maintain CRR and SLR on them. This is an anomaly which can easily

[36]Report of the working group for harmonising the role and operations of DFIs and Banks (formed under Chairmanship of Sh. S. H. Khan) has also mentioned that given its twin importance as a standby liquidity support against premature withdrawals from a bank and also as an instrument of monetary policy, the application of CRR should be confined to cash and cash-like instruments (such as demand deposits and deposits with no minimum lock-in periods). This is also consistent with the international experience in this regard. Similarly, the shift in accent of monetary policy also dictates that it may be advisable to phase out SLR requirements. ...Besides, the era in which SLR was initiated has given way to a regulatory environment characterised by stringent asset classification guidelines, capital adequacy and provisioning norms. These guidelines more than adequately ensure that the financial intermediary will have adequate liquidity to service its fixed-time liabilities. The prudential need for SLR would have, to that extent declined.

[37]There is, of course, a separate question of what the right level of such obligations should be particularly given that since the introduction of these ratios, fairly stringent provisioning and capital adequacy guidelines have been imposed. Imposition of all these obligations and the disappearance of the large historic subsidy implicit in the difference between the savings account rate and the 364 day T bill rate made available to banks, have arguably made banks one of the most expensive providers of money. Further, the presumption of the savings bank accounts being a 'cheap' source of funding is also not true given the high operational cost of servicing savings account (for new generation banks providing high end services, these costs may be as high as 2% of the deposit base.)

be addressed within the Banking Regulation Act so that banks will be able to issue long maturity bonds (including 25 year Deep Discount Bonds) at identical rates.[38]

2. ***Strongly Encourage the use of Derivatives***: Typically, equity, commodity, forex and interest rate derivatives form the primary products in the derivative markets while the insurance companies, banks, hedge funds and large corporates are the larger participants. Derivatives markets are important for the risk transformation roles they play. In the Indian context, these markets are underdeveloped due to a large number of regulatory issues. Currently credit derivatives are not permitted in the Indian markets while the banks are not permitted to trade in equity and commodity derivatives.[39] Further, the market for interest rates derivatives is very thin because there are strict restrictions on the participation of banks in the exchange traded derivatives. While Over-the-Counter (OTC) derivatives may be traded by the banks, the large public sector banks are largely absent from the market. Insurance companies, the other natural counter-parties, have not yet received permission from the Insurance Regulatory and Development Authority (IRDA). Through the use of such derivatives it will be possible for participants to design products which are capital efficient and are tailored to the requirements of infrastructure finance. For example, floating nominal rates give more fixed real rates of interest than do fixed nominal rates of interest. Given the preference for fixed nominal rates on the part of the long-term retail investor, derivative markets provide the only bridge between the

[38]It is true that within a bankŠs balance sheet cash and cash-like instruments and fixed maturity instruments are comingled but it is not clear that this imposes any additional risks. Different countries have defined the liquidity (SLR) and reserve requirements (CRR) in various forms depending on the eligible securities banks are required to hold and the base to which the reserve and the liquidity requirements apply. These are often imposed in a differentiated way on different components of liabilities. For instance, even in developing countries like Brazil, Chile and Colombia, there are different reserve requirements on demand and time deposit liabilities. In these countries, the liquidity requirements applied on the time deposits are generally lower than that for the demand deposits. In Argentina, the SLR rate declines from 17% for liabilities with a maturity of less than one month to zero for those with a maturity of over one year. Currently, developed countries such as Canada, Italy, Australia, New Zealand, Spain, United Kingdom and United States do not use liquidity requirements (SLR) at all for prudential purposes. In view of this, the Indian practice of application of CRR or SLR to "NDTL" is not in conformity with the global trends.

[39]As a consequence, banks which have lent against the security of shares have been unable to hedge their exposures in falling markets and have lost a great deal of money; insurance companies which have largely very long-duration, fixed-income liabilities have lost a great deal of value almost every month as interest rates have fallen and they have been unable to hedge their exposures; banks and DFIs which have lent to companies engaged in commodity businesses such as cement, paper and steel have been unable to lay off the underlying commodity exposures in the international market and have lost a great deal of value as commodity cycles have turned against them; and while for the moment as interest rates have fallen banks have benefited from this, as Patnaik and Shah (2003) point out, the interest rate risk exposure inherent in the balance sheets of most banks are very high.

two sets of needs.

3. ***Free up the allocation of funds from Insurance Companies and Provident Funds***: This is a much harder challenge and before this is done the following questions would have to be clearly answered:

   - In the absence of these funds, will there be a decline in the availability of funds for the central/ state governments?[40]
   - Currently insurance companies and provident funds hold no capital against credit risk and interest rate risk but nevertheless have to deliver promised returns to their investors in a default free manner. Nor presumably do they have the expertise to manage these risks. This could be one possible reason why these entities may have been allowed to lend to DFIs but not directly to the underlying borrowers. Where will this capital come from and how will these competencies be built?[41]

Given the mixed record of state governments and DFIs in servicing their obligations, it is not clear whether the desired objectives have been achieved from the point of view of the insurance company and its investors. On the contrary, it is entirely possible that problems of undercapitalisation that have been encountered by DFIs in the past may feed through to these funds as well. Use of securitised instruments in conjunction with FLDGs, use of professional fund managers and specialised entities such as credit rating agencies and centres of competency such as IDFC and well defined restrictions such as diversity score, duration mismatch and average credit rating of the asset portfolio may hold some of the answers to the questions of competency and capital adequacy. Similar structures could be used wherever state governments are implementing financially viable

[40] As per IRDA regulations, Life insurance and General Insurance companies are required to invest some minimum amounts (20% for general insurance and 25% for life insurance) in different combinations of state and central government securities (without any 'quota' for state governments). Further, while there are stipulations for investments in 'infrastructure and social' sectors to the extent of 15% and 10% for Life and General Insurance sectors respectively, the stipulation of minimum rating of AA for such investments makes availability of such funds very difficult. If such stipulation cannot be removed, the case for a FLDG backed investment becomes compelling.

[41] Globally, insurance companies have been approaching market to raise liabilities / risk capital wherein the returns, sometimes even the repayment of the principal, are dependent on the general or specific risk events being insured by insurance companies (These bonds are generally known as Catastrophe Bonds). In India, the insurance companies have been conventionally dependent on shareholders capital only, which has largely been provided by government.

projects. Where the projects do not have inherent viability but for a variety of social reasons still need to be invested, it would be hard to argue that money borrowed from provident funds and insurance companies should be used to finance these investments.

7 Enhancing the Role of Banks as Intermediaries

Given all the issues surrounding the supply of risk capital and the supply of funds, the manner in which these scarce resources may be intermediated is a very important question. The earlier discussion (also borne out by the Indian experiences) suggests that thinly capitalised, specialised entities focused on the provision of infrastructure and project finance are likely to experience a great deal of difficulty in maintaining viability. Such entities are likely to impose soft-budget constraints on the projects that they finance[42] and given the long-cycle nature of these projects, these entities are likely to over-extend themselves in the initial years because of their desire to grow. Given this behaviour, they are also likely to delay the creation of markets since developers and promoters are going to find it easier to approach such an entity for first time and for on-going finance than a larger group of more dispassionate investors operating with hard-budget constraints. As has been argued earlier, no single entity will have sufficient capital to meet the requirements of infrastructure finance in the country - parcelling this risk out amongst a very large number of investors for each of whom this represents only a small exposure is the only way in which this capital can be found. For this to occur, the development of markets for these instruments is imperative and urgent.

While a few specialised entities exist (such as IDFC) which can play a key role as new generation intermediaries, banks as a class are currently the best positioned to play this role. But, even if all the suggestions regarding sources of risk capital and sources of funds are implemented there is a very real concern that given so many competing choices Banks may choose to under invest in infrastructure[43] and focus instead on other businesses. Or, worse, they could suffer from problems similar to those faced by the DFIs and in the

[42] Given an insufficient supply of capital, it is easier to renew or extend financing than take a charge off.

[43] Given the fact that a large proportion of the banks are in the public sector, it is possible that they may choose to focus their attention on low-risk, low-return sectors so that fewer questions arise when mistakes are made and not build the competency required to lend to the infrastructure sector in a substantial way.

medium term render themselves ineffective. Several steps need to be taken to strongly incentivise banks to participate in infrastructure finance in a well structured manner.

1. ***Eliminate the distinction between an advance and an investment***: Given the importance of instruments such as commercial paper and bonds in providing finance to companies and the ease with which borrowers move between one form of financing and another, there is a strong case that this distinction should no longer be made even in the balance sheets of banks. Even though both sets of instruments increase the level of credit risk borne by the bank in an identical manner, considerations such as credit / deposit ratio, priority sector requirements and a strong regulatory preference for "Advances" over "Investments" create a distorted set of preferences. From a risk management perspective in an environment of a larger and disparate set of investors (domestic and international banks, mutual funds, FIIs, insurance companies, pension funds, HNIs etc.), sophisticated financial intermediaries are likely to give a much more preferential treatment to liquid assets relative to illiquid assets expressing a strong preference for instruments which may be traded resulting into lower yields for 'tradable' instruments. This would become critical in the case of infrastructure finance because a very large number of investors willing to invest in securitised paper would be needed. Once the entire asset base of a bank is treated on par there would be much greater incentive to participate in the market and not focus on originating every single transaction.

2. ***Require detailed product and client segment level profitability, NPA, provisioning and consumption of capital to be reported***: This is important because otherwise income streams and growth from a few segments mask the underperformance of the bank in other segments.[44] This reduces incentives to build specialisa-

[44]The most recent example being treasury led Net Interest Margin and trading profits. Refer Patnaik and Shah (2003). Specifically in regard to this component of income, in an environment where interest rate have declined significantly over the last several years, the absence of a formal capital for market-risk guideline for Banks (the Primary Dealers on the other hand have a formal guideline) which takes into account the characteristics of the entire balance sheet, has produced seriously distorted incentives for Banks, encouraging them to take increasing amounts of market risk on their balance sheets. The Investment Fluctuation Reserve (IFR) that is sought to be created by the RBI merely serves to reduce the general reserve and create another unrestricted reserve and in the process not only does it not therefore change the health of the bank in any way but also acts as a further disincentive to manage interest rate risk because both the conservative and the aggressive set of banks have identical requirements that is not dependent on the profile of market risk in their underlying positions.

tion in each area of business that the bank is engaged in and creates the potential for future catastrophes once the positive returns from the few sectors disappears. This reporting will ensure that right from the beginning the banks are engaged in infrastructure finance in a disciplined manner.

3. ***De-emphasise the role of the Non Performing Asset Ratio as an Independent Performance Measure***: In its evaluation of banks, despite the fact that strong provisioning guidelines and capital adequacy rules have been imposed, in its recent guidelines, the RBI has started to emphasise the NPA Ratio as a stand-alone performance measure. This is both inconsistent and counter-productive. If provisioning has been done properly[45] then the Non Performing Asset is actually the "good" part of the loan (the "bad" part has already been provisioned away) and more importantly if the lender has engaged in high-risk, high-return businesses (such as infrastructure finance), he is likely to have a higher proportion of assets which are not performing relatively to a lender that has only engaged in low-risk businesses. The question to ask would be, are the risk-return models in balance, i.e., what is the return on equity after an appropriate level of provision has been taken and what is the capital adequacy. This independent emphasis on the NPA ratio is sending a strong signal to banks that they need to move away from businesses such as infrastructure finance.

4. ***Directed Credit***: If banks behave as risk-neutral intermediaries, in order to get them to participate in any sector the only requirement would be to ensure that the risks and the returns of the sector are in balance. However, if the concern is that banks are behaving in a risk-averse manner and there is a belief that the positive externality of a rupee of investment in infrastructure exceeds that of a similar rupee in any other sector, it would be very useful to explore the inclusion of infrastructure as a component of the priority sector. However, this should be done while also ensuring that banks are able to meet these requirements by purchasing suitable instruments in the market and not only through originating every asset themselves. RBI has taken a step in this direction with the recent circular dated July 20, 2004 with re-

[45] Provisioning policy is an important issue and it is possible that mechanical provisioning rules end up relatively requiring higher provisioning from lenders who hold fixed assets as collateral and lower provisioning from lenders who hold current assets as collateral.

spect to "Investment by banks in Mortgage Backed Securities - Lending to Priority Sector under Housing Loans". The circular has endorsed the view that exposures of banks in securitised debt (currently restricted to Mortgage Backed Securities) be classified as priority sector lending, if the underlying assets satisfy priority sector norms. This would give a boost to channelising funds of banks, which may not have origination infrastructure in specific sectors such as housing finance / infrastructure etc.

5. ***Capital market exposure limit and ability to take security of shares***: Most of the infrastructure finance projects are executed through special purpose vehicles (SPVs) floated by the sponsors. It is common for lenders, both in India and abroad, to take charge over entire equity of the SPV as a part of security package for the amounts lent. This facilitates easier management of the asset from a lender's perspective. This requires the Banking Regulation Act to be amended to enable banks to take pledge of shares exceeding 30.0% of paid-up capital in case of infrastructure projects. Several projects in the country (especially telecom, ports and toll roads) have entered their concession period stage and are amenable to acquisition financing. Given that the project risk is over and the large scale of finances involved, banks can, if permitted, find very safe opportunities in such acquisition financing. Such consolidation can release equity for the existing promoters, which can come back as seed capital for more infrastructure projects. Further, banks might be taking some direct equity exposure also for better monitoring of the project or retaining some upside in the project. Such equity exposures may be excluded from a bank's capital market exposure limits.

8 Conclusion

Infrastructure growth is a critical necessity to meet the growth requirements of the country. Government led infrastructure financing and execution cannot meet these needs in an optimal manner and there is a need to engage more investors for meeting these needs. Even though the Indian financial system has adequate liquidity, the risk aver-

sion of Indian retail investors, the relatively small capitalisation (compared to the large quantum and long duration funding needs of infrastructure finance) of various financial intermediaries requires adoption of innovative financial structures and revisiting some of the regulations governing the Indian financial system. The risk capital required in the infrastructure sector can be understood as the Explicit Capital brought in as equity by the project sponsors and the Implicit Risk Capital provided by the project lenders. Implicit Capital providers seek to manage their risk-return reward by ensuring availability of adequate Explicit Capital and diversification across various projects. Given this profile of the Explicit Capital, greater flow of this risk capital can be ensured by removing the effects of controllable uncertainties in the policy environment and making available the benefits of diversification through alternate mechanisms. New sources of this risk capital can be sourced by providing partial risk guarantees (in form of First Loss Deficiency Guarantees), formation of highly capitalized financial intermediaries and encouraging securitization transactions. In addition to above, various regulatory initiatives and market reforms are required to enable the commercial banking system to participate more vigorously in providing infrastructure financing.

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Annexure 1[46]

Structure for an FLDG fund

- The government would contribute funds (say Rs. 50.00 billion) to the equity of FLDGF, which could be invested back in freshly issued Government of India securities.
- Interest on the securities can be further reinvested and increase the corpus available under the FLDG fund.
- FLDG fund would have an Investment Committee (IC) which would take investment decisions. IC would comprise of professional in the field of treasury, credit and infrastructure.
- Specific investment guidelines would be set up based on which FLDG fund would provide FLDG to infrastructure projects.
- The savings in the borrowing cost of the project after the credit enhancement (due to FLDG) would be partially passed on as guarantee commission to FLDG fund.

Case study

- 30 project loans aggregating Rs. 60.00 billion are transferred to an SPV. The average maturity of the loans is 3 years. The rating of these cash flows on a stand-alone basis is BBB.
- The probability of default on such BBB rated pool of loans is 24%. Thus, to credit enhance the pool, the FLDG fund shall provide an FLDG.

To enhance rating to	**FLDG required**
AAA	34.0%
AA+	29.5%
AA	26.0%
AA-	17.1%
A+	11.8%

[46]Malhotra and Nigam, Infrastructure Finance in India, ICICIresearchcentre.org.

- Assumptions are:
  - All loans are of equal size, have same credit rating and are independent of default to each other.
  - Recovery rate is 10%.

Portfolio theory works very well in this structure. With a limited FLDG, the rating of the pool can be enhanced, thus increasing investor appetite for the instruments floated by the SPV on the basis of such receivables.