

2 | ISSUES IN PPP

There is a growing consensus among policy formulators that the private–public partnership mode holds the key to the development of infrastructure in the country. In the past, the government used to dominate infrastructure space with hardly any private sector participation. However, times have changed. The government is now focusing on a public–private partnership (PPP) model for infrastructure creation. A host of private sector construction players have invested in infrastructure sector, mainly through the BOT model (Build-Operate-Transfer).

PPP has been in vogue for over a decade in the country and there exists copious literature on what constitutes PPP in terms of ownership of assets and responsibility, operation, and maintenance. There exists some opaqueness on how O&M responsibilities should be transferred from the public domain to the private and what residual responsibilities remain for public institutions to shoulder. Public institution’s financial responsibility also remains clouded as there is a general perception that the private sector can run the facility profitably right from the beginning.

The PPP arrangements through concessions are clear and stable and based on understandable principles not prone to unpredictable changes. This provides a stable regime for private participants to invest keeping in mind the life-time cost of the project. The public sector is inevitably swayed more by political considerations than market demands and economic compulsions. Public figures also tend to prefer spectacular projects over those that make incremental but useful changes and there lies the advantage of PPP.

The government is well aware of the fact that it has to enable regulatory transformation and provide some financial support to ensure viability of the projects. As there is no market, discovery of pricing takes enormous effort and

time. Sometimes the information with private and public entities differs enormously. The first paper on minimum subsidy bidding (originally prepared by the Policy Advisory Groups of IDFC) attempts to clarify the issue related to price discovery.

The most common cause of failure of PPP projects lies in the overestimation of the potential demand for services, which leads to overpricing of services by the private sector. Hence, the choice of the parameters to be used in the assessment of the value for money (the benefit–cost ratio) provided by a PPP project is key to the success of the project. From this standpoint, the conventional Public Sector Comparison index has shown a set of shortcomings due to its limited ability to take into account qualitative elements. As the UK experience reveals, PPPs, most often, significantly outperform classical public procurement during the design and construction phases, thus yielding greater value for money.

Delivery of efficient services to users at affordable prices has increasingly led to private participation in infrastructure sectors around the world. This participation may be in the form of service contracts, ownership of assets, or long term concessions for the right to provide services. Sectors that were seen as monolithic entities are now found to be disaggregated into component services. Within some sub-sectors fully competitive market structures are possible while others retain elements of natural monopoly, precluding competition. Together with regulation, competition for the right to provide these services induces incentives that bring competition-like features to these sectors. The transfer of rights, award of concessions, or sale of assets from the public to the private sector is increasingly being done through competitive bidding, moving away from the practice of awarding these rights through negotiated or administrative means.

But there are issues related to the bidding parameters and the bidding process. The second paper in this chapter (also originally prepared by the Policy Advisory Group of the IDFC) suggests that the key to designing an optimal concession structure is the proper identification and allocation of risks. The new structure offers correct incentives to the various parties that provide the service. The risks depend predominantly on the market structure in which the services are to be provided, including the regulatory environment that oversees that activity.

The primary objective of awarding rights to provide services, or transferring assets through competitive bidding is to put in place an efficient process of discovery of value of these rights and assets. If designed correctly, competitive bidding produces fair and efficient outcomes in a speedy and transparent manner. It takes the government out of the loop in judging the party likely to be innovative and successful. Depending on the service being provided, and the market structure in which it will have to operate, private parties will assign their own valuations to the service. These valuations will determine the best method of bidding according to this paper.

Unlike commercial businesses where promoters provide risk capital and leverage company assets to borrow money from banks, infrastructure projects do not have assets which can be mortgaged. Moreover, the size of each project is such that there are very few companies which can lock in capital for a longer term as required in infrastructure projects. Developers, construction companies, and operators have specific skills to lend to each project. Promoters on the other hand have to move from one project to another than wait out over the whole concession period. How financial products such as securitization and credit enhancement can help in this process is the subject matter of the next paper in this chapter contributed by Anoop Singh.

The Accelerated Power Development and Reform Programme (APDRP) and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) are two prominent centrally sponsored schemes with sector specific focus on the power sector and urban infrastructure respectively. Their success critically depends on PPP. Ravikant Joshi has dealt, in his paper, with outcomes of these two reform programmes, their similarities, key weaknesses, and areas of potential improvement.

2.1

Minimum Subsidy Bidding Model¹

INTRODUCTION

Worldwide, governments routinely use subsidies (subventions) as an instrument to make various services affordable to targeted populations. In the 1990s, some governments opted to bid out subsidies with a view to harnessing competition-induced efficiencies in the provision of associated service obligations. Under this approach, widely known as Minimum Subsidy Bidding (MSB), potential service providers compete with each other and the enterprise that quotes the lowest amount of subsidy requirement becomes eligible for subsidy payments subject to fulfilment of specified level of performance (service provision) obligations.

Many countries including India have successfully deployed MSB to extend services to locations and population segments that are otherwise considered commercially unviable. In terms of sectoral spread, MSB has been used in telecom (Chile, Colombia, Guatemala, Peru, South

Africa, and India), electricity (Argentina, Cape Verde, and Chile), road construction and maintenance (Argentina, Australia, Chad, Chile, New Zealand, India, and UK), health (Australian states, Kenya, Malawi, Saudi Arabia, South Africa, and US), education (UK), and civil aviation (Australia and US). MSB model in different forms is being used in highways, urban mass transit systems (UMTS), and other urban infrastructure projects. An illustrative list of performance improvements and investments achieved through MSB are given below.

An Illustrative List of Successful MSB Models

1. In Chile, a rural electrification fund using annual tenders increased rural electrification by 50 per cent in 1999.
2. In Peru's rural telecommunications scheme, a subsidy of US\$ 11 per inhabitant mobilized an estimated additional private investment of US\$ 22 per inhabitant.

¹ This paper was prepared by members of the Policy Group of IDFC in the year 2005 and updated by Anupam Rastogi for the present report. Views expressed here may not coincide with the views of the organization he works for. The note draws upon various sources, including the World Bank.

3. In Chile, Fondo de Desarrollo de las Telecomunicaciones (telecommunications fund), granted US\$ 10.2 million subsidy during 1995–7 to serve 4504 locations, as against the maximum available subsidy of US\$ 24.2 million. During 1998–9, to serve 1412 locations, a US\$ 9.8 million subsidy was granted, as against the maximum available subsidy of US\$ 14.4 million.
4. In Argentina, output-based road rehabilitation and maintenance funding is estimated to yield an economic rate of return of 60 per cent (at a 12 per cent cost of capital) and to reduce the need for capital investments by nearly 30 per cent.
5. In the Mildura hospital contract in Australia, awarded in 1999, capital costs for the new hospital were 20 per cent below those in the public sector and the hospital provided clinical services at lower cost than government-operated hospitals. All performance targets were met, patient volumes increased by 30 per cent in the first year and the operator made a profit.
6. In north-east Brazil, where the Bahia state government entered into contracts with private firms for the management of 12 new public hospitals, operators routinely exceeded the target volume of patients by 30 per cent.
7. In Sweden, the private operator of the St. Goran's (a 240-bed public hospital of the municipality of Stockholm), has cut unit costs by 30 per cent and is now able to treat 100,000 more patients annually with the same resources.
8. In India, certain stretches of national highways attracted negative subsidy (Rastogi, 2006).
9. In India, to provide telecom infrastructure in rural areas, private companies are willing to roll out wireless telephone network infrastructure nearly 8 per cent cheaper than the subsidy benchmarked by the government (see Chapter 1).

CRITICAL SUCCESS FACTORS FOR AN MSB MODEL

Put simply, MSB is just another instrument of competitive procurement. This does not, however, mean that MSB is always a simple process. To begin with, depending upon the scope and type of services sought to be procured, each transaction could turn out to be a complex and challenging task involving several players. A typical transaction could involve government (treasury and procurement agency), sector regulator, service provider, financier, independent third party monitoring agency, and users of services. Moreover, MSB is normally deployed, not as an isolated instance, but as a sector-wide approach covering several locations. Consequently, one needs to address issues such as prioritizing allocation of available support

across different locations. Thus, even a simple programme based on the MSB approach is likely to involve several steps—defining scope, length of service, and expected outputs/outcomes, earmarking of support, identification, and prioritization of target locations and services, bidding process (including re-bidding in case of poor response), awarding of contract, measurement of performance, and making payments (or imposing penalties).

In view of the aforementioned complexities, it is noteworthy that competition and performance-linked payments, though necessary, are not sufficient for the success of MSB. The experience thus far seems to highlight that a programme relying on MSB, in order to be effective as a sector-wide strategy, should also address several other aspects, as follows.

1. *Match objectives to resources:* The scope of services (including the pace at which they are sought to be extended to target populations) must be congruent with the available quantum of finances. In the absence of a firm link between objectives and resource availability, the process cannot be sustained and, worse, the entire initiative will lose credibility. The scope of procurement may have to be less aggressive. For instance, target consumers (areas) may need to be prioritized, range of services may need to be curtailed, and/or the quality specifications may need to be judiciously toned down. Another alternative is to target the pool of potential recipients progressively, on the basis of cost and recipients' willingness and ability to pay user fees to complement the available subsidies. For instance, in the Chile telecommunications initiative, the ratio of subsidy granted to maximum subsidy available increased from 42 per cent in the first phase (1995–7) to 68 per cent in the second phase (1998–9) and further to 95 per cent in the third phase (2000), indicating that high cost areas were covered in subsequent phases.
2. *Harness all revenue sources.* While arriving at an initial estimate of subsidy support, all avenues of raising resources including user charges must be exhausted. User charges in particular should see a transition towards full cost recovery within a specified timeframe, so as to wean the targeted segments away from the umbrella of subsidy support and, more importantly, to mitigate the risk of subsidy being perceived as a perennial entitlement. In the Chilean telecommunication initiative, the profitability of ventures was boosted by regulatory intervention, wherein operators were allowed to charge higher tariffs (up to a regulated limit) and cost-related asymmetric interconnection rates. Under this interconnection regime, rural operators get access charges that are several times

higher than those of urban operators, enabling them to earn significant revenues from incoming call traffic; the largest Chilean rural operator derives 60 per cent of its total revenues from its positive interconnect balance with urban operators.

3. *Ensure credibility of support:* The promise of support should be for a reasonable length of time, backed by a credible stream of resources, so that the service providers can make their investment decisions with a greater degree of confidence. For example, in Argentina, payment schedule² under road rehabilitation and maintenance contract (called *contracto de recuperacion y mantenimiento* (CREMA)) is designed to provide incentives for the contractor to maintain the network for the full length of the contract. Also, these long-term payment obligations are made legally binding on the government, thereby deterring the treasury from failing to provide funding for road maintenance.
4. *Design optimal and attractive contracts:* The scope and period of contracts should be optimal to make them attractive to private operators. As regards the scope of contract, bidders may be allowed to serve other business segments to augment their cash flows. One operator in Chile who won licenses to build 1800 payphones has built an extensive regional network of 18,000 lines. Allowing operators to bid for multiple contracts (in different locations) could be yet another way to enhance the attractiveness of contracts. As for the duration of contract, it should be adequate to facilitate deployment of appropriate technologies and ensure recovery of a reasonable return on investment. As an illustration, in case of roads, while routine maintenance contracts could be for 1–3 year duration, contracts involving rehabilitation may need to be for a longer duration. This period may vary across sectors. Here, it is noteworthy that Argentina's road rehabilitation and maintenance contracts are for five years, Guinea's water lease is for ten years, and Peru's rural telecommunications scheme involves (nonexclusive) licenses for twenty years.
5. *Choose relevant outcomes and link payments to them judiciously:* Clearly, linking payment to performance is a powerful incentive. However, in order to retain the edge of this incentive in practice and to avoid disputes, performance parameters should be observable, measurable, and clearly delineated ex-ante. The performance measurement process also should be pre-specified. Although one may need to rely on multiple parameters to ascertain that the service being provided

meets the overall objectives of subsidy support, care should be taken to avoid listing too many parameters (intangible ones in particular) as it would escalate the cost of monitoring. Also, before linking payment to performance, attention should be paid to the extent to which expected outcomes are within the control of the operator. For example, in a contract requiring a service provider to maintain the physical facilities in an educational institution, while it may be reasonable to link payments to performance against availability of space or even usage of space, it may not be fair to make payments contingent on learning gains. Incidentally, in the Dudley Grid for Learning scheme in the United Kingdom, wherein the contractor is required to provide a managed information and communication technology service, 15 per cent of the payment in the second half of the contract period (in years 5–10) is linked to impact on education outcomes. Expectedly, the scheme had to provide for assessment of this impact by an independent third party on the basis of such criteria as pupils' and teachers' attitudes about using technology in learning, attendance levels, and educational attainment, including performance on national achievement tests. A critical lesson from this experience is that all services do not lend themselves to be addressed through MSB with equal felicity. Unlike construction and maintenance of physical assets like roads and buildings (including hospitals and schools), certain outcomes such as learning gains in education sector and improvements in patient well-being in the health sector are not easily measurable and are also influenced mostly by factors beyond the service provider's control. Precisely for these reasons, an attempt to force-fit such services into an MSB format is likely to result, at best, in increased monitoring costs and greater scope for disputes and, at worst, in outright failure.

6. *Build safeguards to mitigate the risk of failure:* This is normally achieved through appropriate pre-qualification criteria and due diligence prior to concluding contract agreements, to weed out frivolous and inexperienced bidders. A complementary diligence could also be expected by financial institutions extending debt to the project. In addition, penalties for specific types of performance failures should be pre-specified and rigorously enforced. To facilitate this process, contractors may be mandated to back their performance promises by an appropriate level of bank guarantees. Under the CREMA contracts in Argentina, a pothole

² Advance payment of 5–10 per cent, followed by 15–25 per cent at the end of first six months, when specified activities have been executed, 25 per cent at the end of the first year, when rehabilitation works have been completed and the remaining payments in 48 equal monthly amounts.

left unrepaired beyond the authorised time limit costs the contractor US\$ 400 a day until it is patched and such penalties are deducted from monthly payments.

7. *Ring-fence allocations meant for different objectives:* Whenever costs pertaining to multiple service objectives are sought to be met through a single basket of pooled resources, the allocation of funds across different objectives should be clearly specified, ex-ante. Such an arrangement—akin to the earmarking of the Central Road Fund revenues across national highways and rural roads—mitigates the risk of over-spending on one particular objective, to the detriment of others.
8. *Allow operators to choose appropriate technology and design:* Support should be neither biased towards any particular technology nor linked to specific design elements, as it would curtail the service provider's ability to deploy optimal designs and technologies.
9. *Empower and equip the procurement agency:* Effectiveness of an MSB-based programme hinges critically on trade offs between different goals—such as minimizing subsidy outflow, maximizing performance, eliciting sufficient interest from private operators, and effective monitoring of performance. Orchestrating such a balance is rarely a simple and mechanical exercise. In fact, it calls for a variety of attributes including keen understanding of the sector, diligent planning, rapid and flexible decision-making, transparency, and accountability. In view of this, it is of paramount

importance that the agency responsible for implementation of MSB-based programme is empowered suitably and equipped adequately to undertake all the responsibilities assigned to it.

CONCLUSION

The MSB model, which is fast emerging as a promising tool to improve the effectiveness of subsidy provision, is markedly different from the standard and a more prevalent mode of extending subsidy. It also meets the financial deficit of (mostly government-owned) enterprises. Traditionally, such support has been extended to enterprises that served both subsidized as well as non-subsidized target populations, thereby making it difficult to ascertain whether the support is effectively reaching the targeted population. Furthermore, most of the subsidy-receiving enterprises operated as monopolies and were considered eligible for support by default. Hence, they were not sufficiently driven to deliver the intended level of performance, leave alone improve (investment and operating) efficiencies.

In contrast, MSB relies on competition and profit-maximization motive of private service providers, which jointly instil the right incentive to impart efficiency. Equally importantly, MSB provides a stronger inducement to the service provider to perform since support is squarely linked to the achievement of clearly defined outcomes.

2.2

Competitive Bidding Models for Infrastructure Projects³

INTRODUCTION

Recent years have witnessed a dramatic transformation in approach to the infrastructure sector wherein private provision of these services is now generally acknowledged to be more efficient, both from the investment as well as the operations point of view. Infrastructure sectors are increasingly thought of in terms of 'activities' and 'services' rather than the monolithic natural monopolies of yore. It is now recognized that distinct activities within these sectors may be amenable to competitive growth.

There still remain, however, segments where economic and/or technological characteristics render competition infeasible and hinder contestability for these markets. Efficiency in these activities requires competition for the right to provide services. These segments moreover are characterized by large investments, long gestation periods, and risk profiles that are typical of infrastructure projects in general. The procedures to award concessions for these services must be designed so as to ensure successful implementation. Ill-designed concessions and award procedures have frequently led to sub-optimal

³ This paper was prepared by members of the Policy Group of IDFC in the year 2000 and updated by Anupam Rastogi for the present report. Views expressed here may not coincide with the views of the organization he works for.

performance and consequent renegotiations and delays in implementation and operation.

Transparency in the award of these projects is crucial. Transparency refers to the decision-making process itself, be it based on a financial bid or other selection criteria. Rules and procedures for selection are fixed in advance, and apply equally to all participants. The seller must provide information that would help the bidder evaluate the assets' value, and must fully describe the asset being sold. A transparent procedure reduces the risk of re-negotiation of the contract and costly and time-consuming litigation later that is likely to destroy the economic viability of the concession.

This paper demonstrates that competitive bidding is the most efficient means of awarding the right to provide infrastructure services to the user in the most cost-effective manner.⁴ Similar arguments will also apply to existing assets and services in the infrastructure sectors from public ownership to private. The paper surveys issues associated with the design of such concession contracts and their award to private parties through competitive bidding. The bidding mechanism is intimately linked to the economics of the design of the concession itself,⁵ including allocation of risks and building in of incentive mechanisms. The best concessions contract is one that most transparently incorporates mechanisms for incentives and risk allocation for all participants, and achieves the optimal balance between the two.

THE NEED FOR PRIVATE PARTICIPATION IN INFRASTRUCTURE PROJECTS

The objective of inviting private investment into infrastructure services should primarily be to increase investment and operational efficiencies in the provision of these services although maximizing revenue can be considered an important secondary objective in some cases. The incentives structure to provide more efficient services is more pronounced and robust for the private sector than in the public sector. This is generally true, however, only when the service provider operates in an environment

where more efficient providers can contest for the market. Competition is already a reality in many segments like power generation and supply, telecom, airports, ports, roads, and urban transport.⁶

Many other segments, unfortunately, are not amenable to competition and market contestability such as water supply and sanitation, the 'wires' segment of the power sector, and rural roads services. Competition in these segments has to be centred on the right to provide services. Concessions to provide these services must be awarded in a manner that furthers the objective of efficiency. Mechanisms that mimic competition should assign provision of services to the party that is able to provide them most efficiently. This is called 'competition for the market'.

AWARDING RIGHTS

Infrastructure concession contracts set out the rights and performance obligations of concessionaires and the risks and incentives framework within which they operate, including pricing arrangements. A concession contract must strike a balance between being credible (thus providing potential investors with the security that they will not be expropriated of their investment in the future) and being flexible (by allowing the concession to be modified if new and unexpected circumstances arise). The clarity with which these terms can be defined determines whether there is likely to be renegotiation later on, which may undermine the significance of the initial award. The design of incentives and risk allocation will affect, first, the intensity of competition and, then, the sustainability of the original contract. The concession contract document is critical to the successful implementation of the project.

The nature of the service to which the rights of provision are being sold including the associated market structure and institutions, the policy environment, and the rights and responsibilities of the winning bidder, enables proper identification and allocation of these risks to the entity best able to bear it. This allocation is at the core of concession design and hence the bidding process.

⁴ In what follows, we shall take 'competitive bidding' to mean 'auctions', although they are technically slightly different. Strictly speaking, bidding is a part of an auction format, and is the manner in which interested parties signal their valuation or preferences for the item that is being auctioned.

⁵ Privately financed infrastructure projects being overwhelmingly financed on a non-recourse basis, the tightness of composition and detail of the contract is likely to be the key determinant of the success of the concession. And yet, a large number of concessions in the US or elsewhere go for dispute resolution. Barring national highways BOT projects, airports concessions, telecom concessions, and urban infrastructure projects have gone for dispute resolution in India to sort out award of contract or allocation of resources to concessionaires. In fact, dispute resolution with the authority in the power sector was fought to the bitter end.

⁶ Even when markets are fully contestable, permission to use rights of way or environmental clearances can be awarded in ways similar to concessions contracts. A market is called contestable when competitive pricing can be observed, even though there may be only one firm serving the market, so that it would normally be classified as a monopoly. Its fundamental feature is low barriers to entry and exit.

When services being concessioned are a part of a larger network, inadequate attention to the consequent externalities can impact the commercial viability of the concession. This is particularly true of services in the telecom sector, and to a lesser degree, in electricity transmission and roads.

'COMPETITION FOR THE MARKET' CAN YIELD RENTS

Market Structure

Replicating competitive forces and, hence, getting the best deal for consumers and taxpayers, in infrastructure markets and sectors that are not contestable, requires

- (i) allocating the right to provide services in these segments to those entities that are best suited to do so most effectively, and
- (ii) regulating the performance of these entities in a manner that is consistent with the efficiency gains that normally result from competition.

The market structure of the sector in which the service is to be provided is, therefore, critical to understanding the risks associated with the provision of the service and, hence, the design of the bidding process. For instance, the issues in divesting power generating assets of existing vertically integrated utilities are distinct from those of assigning limited frequency spectrum for cellular services, and vary still further from those of concessioning road services or electricity distribution zones. The timing of asset sales, the means of sales, the environment in which the sale is made, including the regulatory structure, together determine the value of assets.

The optimal method of transferring the rights or the assets would be driven by the very different economic features of each of these activities. In some cases, activities may ideally have to be combined (for example, engineering, procurement and construction (EPC) and O&M contracts for providing road services, and water supply and sanitation activities in urban water services), which in others may need to be separated (generation from distribution services in the power sector).

Regulatory Environment and Incentive Mechanisms

Regulation is tied in with market structure. Competitive markets such as power generation generally need only light regulation. Markets with natural monopoly characteristics need independent regulation. Effective regulation, especially for emerging economies is expensive. The costs of data gathering and analysis can be prohibitive—

sometimes of the order of 5 per cent or more of the revenues of the sector. Economic regulation also has to monitor and evaluate performance and deal with dispute resolution. A well-designed bidding mechanism (and, hence, concession contract) has in-built incentives for efficiency and cost control, so that only light-handed regulation is required. The lack of a well-thought regulatory framework, on the other hand, can delay project implementation significantly.

RISK⁷ ALLOCATION AND MITIGATION

Differing forms of private participation reflect varying risk-sharing arrangements between the investors, consumers, and the government. At the cost of belabouring a point mentioned above, the risks of a project are predominantly a function of the market structure and the nature of the service that the project offers. These can be broadly classified as design, finance, construction, operation, market and commercial, policy (political and regulatory) and force majeure. In some cases, private investors operate projects, but do not own them, such as, management concessions prevalent in the water sector. In others, private parties take on only the operating and collection risks—*affermage* in the French water sector. In one of the most prevalent forms of risk sharing, they also take on investment and financing risks. This includes BOT structures in all sectors spanning power, roads, ports, water supply, and so on. There are also less common approaches where the private sector only constructs and finances, but the public sector operates. These are build–lease–transfer models as implemented in Mexican power projects.

In the initial stages of private initiative in infrastructure, many governments attempted to mitigate commercial risks through various forms of guarantees, including long-term take-or-pay contracts in power-purchase agreements (PPAs), traffic guarantees for road projects, and so on. Although many of these contracts were negotiated, these mechanisms were designed to have the contractor's profitability depending largely on his own cost structure (hence, mimicking private value bids awarded through competitive bidding). These mechanisms, however, were structured predominantly on a cost-plus basis, and there were no incentives to reduce costs, and pass on the reductions to customers of the services.

There is no intrinsic reason why any attempt should be made to reduce the commercial risks of a service provider through guarantees or other mechanisms, when the provider can control, to a significant extent, the revenues for his service (and, hence, his profitability through

⁷ We use the term risk, less in the sense of usage in the academic community and in financial markets predicated on volatility, but in the sense of project finance. There is an assumption of 'loss' in the term.

reducing costs). However, in some of these sectors, the extent of demand may largely be determined by factors outside the control of the concessionaire. The road sector is the most graphic example. Traffic flows on the section of road that is being concessioned would depend on the state of the road network that feeds traffic into and evacuates traffic from that section. It would also depend on alternate roads that are available to traffic. For such projects to be viable, some of the risk has to be shifted away from the concessionaire through incentive-compatible mechanisms to reduce costs. The use of annuities from a dedicated road corpus, funded through fuel taxes, is one such avenue. Innovative bidding procedures based on the Least Present Value of Revenue (LPVR) are another (Rastogi, 2005).

DESIGN OF THE CONCESSION STRUCTURE

The optimal length of the concession is yet another decision factor. If significant capital investment is required, then the contract has to be for a period sufficient for the concessionaire to recover his capital costs. O&M contracts may be for smaller durations. However, the termination and renegotiation of the concession should be formulated in a manner that minimizes the (dis)incentive for the concessionaire to lower investments. Performance clauses in the contract have to specify minimum standards that the asset has to meet. A more endogenous incentive is to structure the bidding for renewing the concession in a manner that allows the incumbent concessionaire to retain part of the value of the asset should they be outbid by a new entrant.

THE PROCESS OF BIDDING: DESIGN, STRUCTURES, AND PROCEDURES

WAYS OF AWARDING CONCESSIONS OR TRANSFERRING ASSET OWNERSHIP

Together with light-handed regulatory monitoring, competition for the right to provide services in the sector can be generated through a bidding process. Many emerging countries now use competitive bidding to award concessions for infrastructure projects to private firms,

in sectors such as water, waste disposal, transport, and power distribution.

In India, until 2000, rights to provide various infrastructure services, including concessions, were usually awarded through negotiated (or administrative) mechanisms, including Memoranda of Understanding (MoU). While these may have had the advantage of speed, and avoided the costs normally associated with preparing for the bidding process,⁸ the biggest drawback was a lack of transparency. Inadequate information about opportunity costs of the funds being invested in the project that was being concessioned more often than not resulted in sub-optimal use, and encouraged lobbying for the concession, and default and renegotiation later. It may be argued that there was no alternative to awarding some projects through a negotiated route.⁹ It is a debatable point that the outcome in these would have been more efficient through competitive bidding.¹⁰ Had a thorough project analysis been conducted beforehand, or bidding procedures thoughtfully designed, it is likely that the difficulties faced in many of these would have been obviated or at least considerably mitigated (Box 2.2.1). By submitting clear bidding rules instead of negotiating, the concessioning authority is likely to increase its bargaining power and elicit the best possible bids. However, the greater the discretion in awarding contracts (normally arising from a difficulty in scoring and comparing bids) the stronger the prospects of renegotiation. Competitive bidding may not be suitable in all circumstances, however. They may be impracticable for high volume, low value licenses, where there are more slots than applicants available, for instance, in private business radios, such as those used by taxis.

DESIGNING THE BIDDING MECHANISM

Objectives of Competitive Bidding

The bidding mechanism can address multiple objectives if carefully designed.

Discover true market value

The bidding process should result in prices of concessions that reflect their true market value and can, at arm's-length,

⁸ The transactions costs for preparing bids can easily amount to 5–10 per cent of the project's total costs.

⁹ In the Philippines, the first Independent Power Producers (IPPs) signed Power Purchase Agreements (PPAs) with utilities for supplying power at 5 cents per unit. Subsequent PPAs awarded through competitive bids were supplying at 2–3 cents per unit. However, it was estimated that the opportunity costs initially of having no power rather than costly power was 50 cents per unit.

¹⁰ Competitive bidding for very small water utilities each supplying just a few thousand customers may not justify the transactions costs of the process. One option to get around this problem is to pool the utilities and have them bid for a single large concession. Another is to limit the number of bidders through a short-listing procedure. Yet another option is to have consumers share the costs of bid preparation. The UK's Private Finance Initiative (PFI) allowed such sharing of costs of up to 50 per cent, and PFI has been used for the Eurotunnel project.

BOX 2.2.1**Different Types of Bidding Procedures***Single round sealed vs multiple round open bidding*

Most infrastructure concessions are awarded through a two-step, first-price, sealed bid mechanism, but open bidding is generally used for award of licenses for the spectrum.¹¹ Sealed bids often have a significant spread between bids, engendering a notion among government authorities that high revenues or low tariffs would emerge as a result.¹² Academics, on the other hand, feel that open bidding generates more aggressive (but more credible) responses. Bidders have less information on others' valuations, exacerbating the problem of the 'Winner's Curse'.¹³

First- vs second-price bidding

This is normally an issue only in single round bidding¹⁴ because in a sealed bid first-price bidding the buyer submitting the highest bid wins and pays the price. In the second-price bidding buyer submitting the highest bid wins and pays the second highest bid. According to Game Theory, the second bid reflects true valuations.

A process of escalating (or descending) bids to award a right to the highest bidder is open bidding. One variation on the open-outcry bidding is the open-exit bidding in which the prices rise continuously, but bidders publicly announce that they are dropping out when the price is too high. Once a bidder has dropped out, he may not reenter. This variation provides more information about the valuations (common or public) of others than when players can drop out secretly (and sometimes even reenter later).¹⁵

The principal advantage of multiple round bidding is the information that it provides bidders about the value other bidders place on the item. This information increases the likelihood that the items are assigned to the bidders that value them the most. They will also typically yield more revenue than bidding where there is uncertainty about common factors that affect the value of a licence for all bidders, that is, who did bid and how much. Theory shows that multiple round bidding tends to increase revenues by reducing the incentives for bidders to be overly cautious while trying to avoid the 'Winner's Curse' (Table B2.2.1). Bidding may be either ascending ('English') or descending ('Dutch').¹⁶ The merits of either, in terms of revenue generation and information revelation, are still not completely clear.

TABLE B2.2.1
Characteristics of Different Types of Auctions

Type	Rules
English, or ascending-price. Open.	Seller announces reserve price or some low opening bid. Bidding increases progressively until demand falls. Winning bidder pays highest valuation. Bidder may re-assess evaluation during auction.
Dutch, or descending-price. Open.	Seller announces very high opening bid. Bid is lowered progressively until demand rises to match supply.
First-price, sealed bid. Known as discriminatory auction when multiple items are being auctioned.	Bids submitted in written form with no knowledge of bids of others. Winner pays the exact amount he bid.
Vickrey auction or second-price sealed bid. Known as uniform-price auction when multiple items are being auctioned.	Bids submitted in written form with no knowledge of the bids of others. Winner pays the second-highest amount bid.

¹¹ In New Zealand's award of spectrum licenses, second-price sealed bidding was used.

¹² One of the first applications of competitive bidding in India was for cellular mobile telephone services in the four metros, awarded in November 1994. Licence fees were fixed beforehand, and the companies bid on the basis of rental charges to consumers. Bidding parameters were the same, and two highest bidders were to be granted licenses based on the second highest bidder matching the highest bid. HFCL's bid for nine telecom circles was substantially larger than that of the second highest bidder.

¹³ This means that the concessionaire may end up paying more for an item than its value. Differing information sets and abilities to value a concession could lead to an outcome where the most optimistic bidder rather than the most efficient will win the contract, leading to failures in executing the contract, pressures for renegotiation and excessive costs. In competitive bidding, the idea is that since some buyers will underestimate the value of an item and others will overestimate it, the high bidder will usually be one of the people that overestimated. Therefore there is a good chance that the 'winner' paid too much for the item. In other words there is a tendency for the winning bid to exceed the intrinsic value of the item being auctioned, common in sealed bid auctions.

¹⁴ It does not make sense to use second price award in open bidding. A bidder's optimal strategy in bidding for a licence that he values at say Rs 100 crore, may be to bid Rs 1000 crore, provided he thinks that other bidders would not follow the same strategy.

¹⁵ The recently concluded bidding for FM licenses in major and minor cities in India was a variation of this, and was, a little whimsically perhaps, called a 'Dutch auction'. If, say, there were 10 FM licences to be awarded in a city, the bidding authority would call out ascending bid values. As potential bidders dropped out with the increasing bids, the bids stopped at the value where the remaining bidders just equalled the number of licence slots available. All licences were awarded at that bid value.

¹⁶ The pitfalls of bidding are nowhere as marked as in the descriptive terminology used. The descending-price bid, commonly known in academic literature as the 'Dutch auction', uses an open format rather than a sealed-bid. Unfortunately, the financial world has chosen

Ascending or descending formats

Sequential vs simultaneous bidding. If a number of similar licenses or concessions are being awarded, (such as, spectrum licenses for wireless applications, electricity distribution franchises, road stretches in contiguous areas for rights-of-way, or airport slots for airlines that have to be aggregated into routes) or a series of assets to be sold (electricity generation plants), simultaneous bidding is a more effective means of discovery of market valuation because of the many externalities present.¹⁷ The market decides how to aggregate components of a system most efficiently.¹⁸ The items to be bid on may be either substitutes or complements. Complementary licenses are worth more as a package than individually.^{19,20} The benefits of aggregation, however, need to be balanced by the need to mitigate market power.²¹

Simultaneous, multiple round bidding

Simultaneous multiple round bidding is particularly efficient in awarding several similar concessions with interdependent values. Radio Spectrum licensing is a classic example of the benefits. This bidding process was used in the USA by the Federal Communication Commission (FCC),²² and has since been successfully replicated by Mexico²³ and the Oceania countries. The efficiency of simultaneous bidding in a multiple round format stems from the reduced need for the bidder to guess outcomes in later bidding rounds. In sequential bidding, a bidder may pay a lot for a licence in an early round with the mistaken expectation of a low price for a complementary licence in later rounds. This method enables the discovery of market valuation of the network and bidders can continually reassess their strategy and preferences in light of competitors' bids.

provide underlying valuations of the benefits, costs, and risks associated with the contract. Related to this is the notion of economic efficiency, which is established when the concessions are held by those who value them the most, an outcome that arises endogenously from the bidding process.²⁴

Provide Transparent Assignment

The process of assigning concessions to winning bidders is conducted in an open and transparent manner that assures all participants of equal treatment. Such a transparent process encourages participation by reducing

bidders' uncertainty and simplifies regulatory oversight of the assignment process.

Mitigate Market Power

An optimal bidding design addresses the objective of mitigating market power and promoting competition by imposing restrictions on the amount and type of capacity that each bidder may hold. This results in better price signals for the concession that accurately reflect real resource benefits and costs. In turn, this can lead to market-driven commercial decisions with regard to investment in new capacity and efficient use of existing capacity.

to refer by this name, another type of bidding, commonly known in the academic world as a uniform, second-price bidding. To make matters worse, the financial community refers to a sealed-bid, discriminatory type of bidding as an 'English auction' (except in Great Britain where it is known as the American auction!).

¹⁷ The FM Licences for the different metros were awarded sequentially. It is an open question whether the government could have increased sale revenues by offering these simultaneously, by exploiting gaming behaviour between bidders based on the externalities arising from, say, advertising revenues.

¹⁸ Secondary markets (for licenses) may then improve on the aggregations.

¹⁹ If there are restrictions on the degree of concentration of the concessions, the bidding rules must specify how the winner will be determined should the same company announce the highest bids for more than one concession. The Peruvian government split the service area for awarding electricity distribution concessions in Lima into two separate areas, roughly equal in size and consumer base, to facilitate benchmark tariff regulation. The awards were through a simultaneous, sealed-bid procedure. The bidding rules specified that if the same firm made the highest bids for both concessions, the winners would be selected based on the bid combination providing the highest revenue.

²⁰ Mexico, on the other hand, concessioned three rail lines sequentially, the rationale being that concessions were not of equal market value, and that bidding the most attractive would reduce bidder uncertainty.

²¹ In the Mexican railway concessions, the bidder could not win more than one concession, and therefore needed to value each concession and bid what it was worth.

²² Bidders submitted computerized bids for spectrum licenses being offered in any number of markets. These bids were posted for all bidders to see, and rebidding takes place over several rounds. Bidding continued till no new bids were received, or at the discretion of the FCC.

²³ An unwitting version of this procedure was inadvertently followed in the bidding for licenses for Indian cellular telecom and basic operations services. However, the subsequent rounds of bids needed to be submitted due to confusion about the bids and prior conditions rather than any premeditated strategy. There have also been problems with this format in Australia and New Zealand (see Box 2.2.3 on design of bidding procedures).

²⁴ In spectrum licence awards, for example, bidders pay a cost determined by the bidding, instead of a licence fee fixed by the government. This amount is determined by the overall business plans of the operator and the expected prices for the services, not the other way round.

Optimize Bidding Proceeds

The bidding process optimizes bidding revenues, especially in the case where a scarce resource is being allocated. Positive proceeds can be transferred to consumers and negative proceeds recovered through levies on consumers.

Tradeoffs Among the Objectives

The bidding design problem is somewhat complicated because the objectives above are often not perfectly consistent with one another. One objective may not be achieved fully without sacrificing the complete attainment of another objective. Two objectives that involve an explicit tradeoff are mitigating market power and optimizing the bidding proceeds. In such an event, overriding priority should be given to the former.

Bidding Formats

There are two broad formats for bidding—sealed and open. If there is a group of similar concessions or licenses being awarded, there are two sub-possibilities for open bidding—sequential or simultaneous. A sealed bid award could be a single-step one based on combined technical and financial criteria, or it could be a two step process, with an initial technical pre-qualifying round, and a second financial one. The concessions may be awarded based on either the highest price, or the second highest one. A simultaneous bidding procedure could be conducted in a single round, or over multiple rounds. Most infrastructure concessions have hitherto been awarded through two-step first price sealed bids. A novel bidding process based on a simultaneous, multiple round ascending structure was devised

BOX 2.2.2**Simultaneous, Multiple-round Ascending Bids for Spectrum Licences in USA**

The ‘simultaneous ascending auction’ was first introduced in 1994 to sell licenses to use bands of radio spectrum in the US. Much of the attention devoted to the auction came from its role in reducing federal regulation of the radio spectrum and allowing market values, rather than administrative fiat, to determine who would use the spectrum resource. Many observers were also fascinated by the extensive reliance of the auction on web-like information technology. The large amounts of money involved were yet another source of interest. The very first use of the auction rules was a US\$ 617 million sale of ten paging licenses in July 1994. In the broadband personal communication services (PCS) auction, which began in December 1994, ninety-nine licenses were sold for a total price of approximately US\$ 7 billion. Once the auctions had been conducted, it became much harder to ignore the tremendous value of the large bands of spectrum allocated to uses such as high definition television, for which Congress had demanded no compensation at all. Moreover, the perceived successes with the new rules inspired imitators to conduct similar spectrum auctions in various countries around the world.

Reviews suggest that the new auction design realized at least some of the theoretical advantages that had been claimed for it. Several parts of economic theory proved helpful in designing the rules for simultaneous ascending auction, and in thinking about how the design might be improved and adapted for new applications.

One of the most frequently expressed doubts about the spectrum auctions is that whether the method of the auction matters at all. After all, the argument goes, one should expect that if the initial assignment resulting from the auction is inefficient and if licenses are tradable, the licence owners will be motivated after the auction to buy, sell and swap licenses until an efficient assignment is achieved. There are both theoretical and empirical grounds for rejecting this argument. Briefly, the argument combines two theoretical observations from the theory of resource allocation under incomplete information in private values environments. The first observation is that efficient bargaining outcomes in such an environment are generally impossible to achieve. Older theoretical literature shows this for the case where there are just two parties to the bargain and the efficient allocation of the licence is uncertain. Recent work suggests that the efficient outcomes become even less likely when there are multiple parties involved, as is the case when a bidder needs to assemble a collection of spectrum licenses from multiple owners to offer the most valuable mobile telephone service. The years of delay in developing nationwide mobile telephone services in the US, despite the value customers reportedly assigned to the ability to ‘roam’ widely with their phones, testify to the practical importance of this theoretical effect. An inefficient initial assignment cannot, in general, be quickly corrected by trading in licenses after the auction is complete.

In contrast, the generalized Vickrey auction in the same environment can achieve an efficient licence assignment—at least in theory. There are practical difficulties in implementing a Vickrey auction in the spectrum sales environment, but the theoretical possibility of an auction that always yields an efficient outcome suggests that a good auction design may achieve efficiencies that are not available once the auction is concluded. That is a large part of the motivation for finding an auction design that yields a nearly efficient licence assignment even without any post-auction licence trading.

A second common question concerns the trade-off between the goals of allocational efficiency and revenue. The primary goal of the spectrum auctions was set by the 1993 budget legislation as one of promoting the ‘efficient and intensive use’ of the radio spectrum. However, the simultaneous ascending auction is now also being touted for other applications, such as the sale of stranded utility assets in which revenue is regarded as an important objective. Such applications call for laying more emphasis both on how the auction rules affect revenue and on the extent of the conflict between the goals of efficiency and revenue in multi-object auctions. Particularly when the number of bidders is small, the goals of efficiency and revenue can come into substantial conflict.

for auctioning parts of the spectrum in the US starting 1997, and its use in awarding concessions across many more sectors is gaining popularity (Box 2.2.2).

Common Value vs Private Value

The design of the process of awarding the rights to the concessionaire will depend on the valuation that is placed on the concession. In many concessions, the bidders' valuation of the rights to the concession will depend not just on their own competence, but also on other factors that will affect all bidders, for example, the willingness-to-pay of consumers, or the future behaviour of regulators. Each bidder will have access to different areas of a common information set, and a different valuation metric. Cases where the value depends on factors that affect all bidders are called *common value* bids. Cases where the bid values depend only on the characteristics of the bidder, or on factors that are within the bidder's control, are *private value* bids. Most infrastructure concessions to build, manage, and operate projects (as opposed to construction contracts) are intrinsically common value, they can be made to resemble private value bids through mitigation of commercial risks to the extent possible, as discussed in the section on risk allocation above. Two questions arise from this.

First, what is the appropriate bidding process that will maximize the objective of the award, given the valuation that the bidders assign to the contract? If the concession is being awarded for activities like project construction, whose completion is largely under the bidder's control, the valuation of the contract would be to a large extent private. A sealed-bid award would produce the best results in these cases. When the costs of construction depend on the operation of the concession, as in the case of network rollouts for telecom services, there is a large element of common valuation built in. These concessions are best awarded through open bidding since this maximizes the process of value discovery by the bidders (Table 2.2.1).

TABLE 2.2.1
Outcome Matrix for Competitive Bidding

	Sealed Bid	Open Bid
Common value	Low efficiency Low collusion	High efficiency High collusion
Private value	High efficiency Low collusion	Low efficiency High collusion

Second, is it desirable to modify the valuation with the aim of better achieving the objective of the contract? In some concessions, there is a significant market risk that may be beyond the control of the concessionaire. Traffic

on toll roads depends to a large extent on exogenous factors like the state of the economy and road network externalities, apart from the ability of the road operator to maintain road quality. If these risks are taken away from the concessionaire, the discovery of value of the concession may be refined.

Congruence of Formats with Objectives of Competitive Bidding

In weighing the advantages and disadvantages of the alternative bidding formats, their congruence with the nature of the valuation of the concession is the primary yardstick. First, wherever appropriate, the bidding process should allow bidders to form their preferred aggregations of services. It is very difficult for one-shot sealed-bids, sequential bidding, and two-step processes to provide sufficient flexibility to bidders to accomplish this. Second, these formats generally do not address the winner's curse problem as well as alternate formats do. There is little, if any, objective contemporaneous price revelation of bids for related items, much less opportunity for bidders to respond. Third, bidders are unlikely to bid as aggressively in these less transparent formats, and the outcome may be characterized by distorted market values, reduced revenues, inefficient outcomes, and different winning prices for similar concessions. Moreover, regulators and the public generally prefer more transparency rather than less. In short, there are many shortcomings with the alternate auction formats with respect to the objectives of bidding for common value contracts.

Well-informed Discovery of Market Values

The sample average approximation (SAA) is the format most likely to result in prices that reflect their fundamental market values and avoid the pricing errors associated with the winner's curse and guesses that bidders must make in most other designs. It allows bidders to observe and respond to prices as they emerge, which improves the accuracy of their forecasts and improves the efficiency of outcomes. Moreover, the rules of the SAA ensure that similar prices are established for similar concessions. Any process that establishes a uniform price for each type of service allows large buyers to exercise some market power, undermining the efficiency of the outcome. However, within the class of standard formats that do set a uniform price, the SAA maximizes efficiency by minimizing bidder error.

Transparency

The SAA is open and transparent—its rules are both objective and stated in advance. The process of bidding provides a public record of the competition among competing

buyers, a record that is open to inspection at each round of the bidding process. Regulators and other interested parties will insist that the process allow all bidders to compete on an equal basis. The open and transparent competition of a simultaneous ascending auction would address regulators' and bidders' concerns.

Mitigating Market Power and Promoting Competition

As discussed below, market power is addressed in the bidding design primarily in terms of ownership and cross-holding restrictions. The rules specify restrictions regarding which bidders can bid on which concessions. The SAA is conducive to these types of restrictions while achieving the objectives because the complete rules are well specified ahead of time. The SAA provides bidders maximum flexibility (subject to these restrictions) to acquire their desired contracts as prices evolve through the bidding, while at the same time the bidding outcome can be audited. Ongoing monitoring and antitrust laws and regulations are required to enforce market power restrictions after the award.

Revenue Optimization

The SAA is designed to minimize the effects of the winner's curse. The open, transparent bidding process of the SAA provides valuable information to bidders, which instils in them a level of confidence in their bidding not found in many other auction formats. The bidding information available to bidders in the SAA reduces the need for them to bid conservatively and shade their bids; that is, it mitigates the winner's curse problem. This leads to higher winning prices and greater revenue than other

formats that lack the transparency and bidding information provided in the SAA.

In addition to the winner's curse problem, revenue can be reduced if bidding itself suffers from collusive behaviour by bidders. The rules can affect the ability of bidders to act collusively to reduce prices. The specific rules that we recommend limit the bidders' ability to communicate, to form bidding consortia, and to retaliate against other bidders who violate collusive agreements, thereby promoting higher, more competitive prices for the concession sold.

CLARITY IN DESIGN OF THE BIDDING PROCESS

To encourage efficient performance and to minimize post-award renegotiation, it is crucial to consistently and comprehensively define performance specifications and the parameters of incentives and risk-sharing. A characteristic of most infrastructure concessions is that there are only a limited number of players globally, and even fewer that are likely to participate. Collusion among bidders is difficult to preempt and requires exhaustive project preparation. Multiple round simultaneous bidding may be occasionally used for O&M contracts on selected road stretches to exploit network externalities.²⁵

Concessions may also be re-awarded by way of further bidding, although somewhat arbitrary bid preferences may have to be set. The bid authority for complex concession contracts should operate at arm's length from all interested parties, including politicians. It may make sense to let independent agencies that regulate the concession scheme conduct the bidding (Box 2.2.3).

BOX 2.2.3

The Importance of Design of Bidding Procedures

The success of the spectrum sales in the US is often cited as proof of the efficacy of competitive bidding, but there are enough instances of glitches in the same process in other countries that arose due to the lack of attention to technical details.

- In one of the New Zealand second price bids for radio, television, and cellular licenses, one company that had bid NZ\$ 100,000 paid the second highest bid of NZ\$ 6. *Moral:* Reserve prices need to be given a thought.
- In the Australian first price bidding for satellite TV services in 1993, the licenses were won by two unknown companies whose winning bids were around A\$ 200 million. They then promptly defaulted, since there were no default penalties in the contract. They had also put in a series of lower bids (twenty descending bids in steps of A\$ 5 million) and continued to default over the year. They finally paid roughly A\$ 100 million, which they later sold to another company for a profit of around A\$ 20 million. *Moral:* Pay attention to the 'fine print' of penalties.
- The Indian DoT decided to restrict the monopoly power of the bidders in the bidding of cellular mobile services for the nineteen circles after the results of December 1994, as a consequence of which some circles were vacated by the winners, and the second highest bidders failed to match the winning bids, requiring rebidding. Highest bidders for radio paging services failed to provide the requisite bank guarantees within the stipulated time, the second highest bidders failed to match the highest bids, again requiring rebidding. *Moral:* Ensure credibility of bids.

²⁵ The UK DBFO concessions are one such instance.

Bidding Parameters

Bidding parameters relate to the design of incentive mechanisms, and will vary according to the nature or the market structure of the industry of the asset or service that is being sold or concessioned. When an asset (like a power plant), including an intangible one like the spectrum, is being sold, the parameter typically is the value of the asset.

In bids for infrastructure service concessions in sectors like roads, ports, water supply or sewage disposal, the parameters usually are: the lowest tariff to be charged to consumers, the lowest subsidy that the government must provide to offer a commercially viable service, the shortest duration of the concession, the lowest cost to the government for constructing or operating services or facilities, the lowest income guarantee requested from the state, the largest amount of new investment to be undertaken by the operator, the highest revenue offered to the state for existing infrastructure (either a share, or a flat offer), the lowest present value of future revenue streams.

Bidding on the shortest duration for the concession, given a predetermined tariff rate, is generally considered to be exceedingly prone to re-negotiation, and is rarely used as an award criterion.²⁶ A feature of most forms of concession bidding, therefore, is that the duration of the contract is pre-specified by the government. Some mechanisms, such as those used in private highways in Mexico, gave the concession holder the option of extending the franchise for an additional fixed term at the end of the original term. The problems associated with fixed term franchises apply to this form as well.

The primary defect with fixed term concessions is that they create unnecessary risk for the concession holder. Since demand is uncertain and competitive bidding results in ex ante rents being extracted away, the winner faces significant losses if demand projections are (over) optimistic. Because of this risk, high risk premiums of up to 30 per cent of investment cost are demanded. Risk makes lenders uncomfortable in the absence of government debt guarantees or minimum revenue guarantees. These factors reduce incentives for lenders to screen projects and monitor their performance. In addition, when demand is less than projected, contracts are often renegotiated and losses shifted to users or taxpayers. The expectation of renegotiation prompts firms to bid artificially low tariffs. It is difficult to agree on the fair compensation (the expected income foregone over the remainder of the concession) to be paid to the licence holder in these cases.

While bidding on the direct user charges is the most common, there are other possibilities. Telecom licenses in India in the past were assigned both on bids submitted on licence fees, in the case of cellular mobile services, and on the lowest prices that would be charged to customers given a fixed level of licence fees determined by the government. Concession offers can similarly require bidders to bid on licence or entry fees, with a fixed revenue share (Table 2.2.2).

A new form of bidding was tried in Chile based on Least Present Value of Revenue (LPVR), and this is promising for projects which have a significant private value component built in, that is, where the concessionaire can, to a large extent, control the construction and operation risks of the project. If the franchise holder bears a demand risk, that risk is partially shifted to the taxpayer. This enables

TABLE 2.2.2
Examples of Parameters in Financial Proposals

Highest price, in cash or debt retirement, to be paid for the assets, or highest concession fee (one-time or annual)	Lima, Peru: electricity distribution privatization
Lowest cost to government for constructing or operating facilities	Mumbai Metro One Project, NHAI projects
The largest amount of new investment	Delhi Airport and Mumbai Airport in India
Lowest tariff to be charged to consumers	Buenos Aires, Argentina: water concession (maximum discount to existing tariffs), lowest price of power for power generation BOTs in Philippines
Lowest net present value of future revenue	None
Revenues offered to the state or reductions in tariffs for end users once profits of concessionaire reach pre-established levels	None
Lowest subsidy/income guarantee that the government needs to provide to the winning bidder	National and State highway project in India
Duration of the concession	See footnote 26

²⁶ In a version used in some highway franchises in Mexico, the toll (user fee) was set by the regulator and the franchise was awarded to the firm asking for the shortest term.

the most efficient bidder to reduce his risk premium and lower fees for the user. The process is as follows. Instead of bidding for the lowest tariff for the user, given a fixed duration, the concessionaire bids for the LPVR, and the term of the concession adjusts endogenously to demand. Bidding being based on single parameter, this reduces scope for re-negotiations on the bidder's part and of creeping expropriation on the part of the conceding authority (see Box 2.2.4).

Bidding on Multiple Parameters

Bidding for concessions can also be based on a combination of parameters. Bidding parameters might include the

payment of a share of revenues from toll collections to the conceding authority, or a combination of a flat fee and a revenue share. It is generally agreed, however, that bidding on a concession with more than three parameters usually defeats the purpose of maximizing multiple goals by making the outcome too complex, and introduces administrative arbitrariness and inevitable renegotiation (see Box 2.2.5).

SUGGESTIONS

1. As a rule, concession awards should be made through competitive bidding, unless there are overwhelming

BOX 2.2.4

LPVR as a Bidding Parameter for Road Concessions, and its use in Awarding Concessions in Chile

The combined effects of special features of the highway business and the type of concession contracts that have typically been used have led to serious problems. First, traffic forecasts are notoriously imprecise. Second, most concessions awarded for a fixed term have been independent of demand realization. This has led to the origin of an innovative bidding parameter, LPVR.

The mechanics of LPVR bidding are as follows:

- (a) Regulator sets a maximum toll.
- (b) Concession is won by the firm that bids the least present value (PV) of toll revenue.
- (c) Concession ends when PV of the toll revenue equals the winner's bid.
- (d) The toll revenue is discounted at a predetermined rate specified in the franchise contract. The discount rate should be related to the loan rate faced by the concession holder.

The central tenet of LPVR bidding is that the concession holder should not incur losses when the long-run demand for the highway is sufficient to pay all costs. Basically, the length of the concession period increases if traffic is less than expected, and shortens in case of the converse. The LPVR auction endogenously adjusts the duration of the concession to the realization of demand.²⁷ Risks are lowered, and the winner's curse is mitigated. *Ipsa facto*, users, on average, pay less. Advantages include: (i) the winner's bid reveals the income required to be earned for normal return (which can be used as a benchmark); (ii) renegotiations are less likely since the probability of financial distress is reduced; and (iii) in case of termination, the difference between the PV of revenue earned and the original bid represents a relatively transparent compensation.

There can be two main objections to LPVR auctions: (i) for lenders it may be difficult to structure financing where the concession term is not fixed. A contingency financing type of structure needs to be contemplated. On the flip side, equity holders would view the LPVR method favourably; therefore debt–equity ratios may end up being lower; and (ii) disincentive for demand enhancing activities, including investment in road quality and maintenance (this issue can be mitigated by regulatory agency-imposed minimum quality standards).

BOX 2.2.5

The Dangers of Multiple Parameters Bids

One of the first concessions to be awarded in Chile's highway concessions programme, the El Melon Tunnel, used a weighted average of seven variables, including the toll level and payments offered to the state. These two turned out to be the critical factors in the outcome of the bidding process. The winning consortium offered a high toll level (set at the upper end of the allowed range) and a high payment to the government. (The government expected the tunnel to be unprofitable at the maximum tariff level and expected the project to go to the bidder soliciting the lowest subsidy, but the winning firm offered to transfer resources to the government instead.) The resulting high tolls created a significant traffic diversion to the free alternate road over the mountain where the tunnel was located. This lowered the revenues of the concessionaire and resulted in an inefficient allocation of traffic between the tunnel and the mountain road. The concessionaire subsequently lowered tolls, and negotiated later to reduce payments to the state in exchange for yet lower tolls.

²⁷ Nevertheless, roads that turn out to be white elephants (unviable even in the long run) cannot be avoided. These projects arise due to extraneous circumstances, which economics cannot take care of.

- reasons to do otherwise, such as excessive transactions costs (for the size of the contract) or very special circumstances where speed or innovation compulsions exist.
2. A lot of attention should be paid to the market structure in which the concession will operate. This will enable a comprehensive identification of the risks involved.
 3. The design of a concession contract should reflect appropriate allocation of risks. This will determine the commercial viability and success of the project. Detailing the rights of all parties involved in the contract will reduce the possibility of eventual renegotiation.
 4. The objective of the award should be the allocation to the party that can provide the services most efficiently to the final user. Revenue generation for the taxpayer should be a secondary objective. In case of a conflict between the two objectives, efficiency of service provision should be the priority.
 5. If the service to be awarded is such that the concessionaire has control over the factors for successful implementation of the project, a sealed-bid method in the bidding process should be used. For services where the cost to the concessionaire depends on exogenous factors as well, open bidding is more suitable.
 6. Simultaneous bidding is most appropriate for cases where concessions for many similar services are being awarded, or when the concession is part of a network where the valuation of the concession will depend on forward and backward linkages.
 7. Competitive bidding produces the most efficient outcomes if there are a sufficient number of bidders. Keeping the process simple and eschewing onerous pre-qualification norms for bidders ensures this.
 8. Simplicity in the selection of bid parameters, and the bidding process, is paramount. If multi-parameter bidding is necessary, there should not be more than three parameters.

2.3

Securitization and Credit Enhancement for Catalyzing Infrastructure Financing

Anoop Singh

INTRODUCTION

The Committee on Infrastructure (GoI, 2007) estimated investment requirement for the infrastructure sector in India during 2007–12 to be over US\$ 320 billion (at 2005–6 prices). Recently, the Deepak Parekh Committee on Infrastructure Financing increased the estimated investment requirement²⁸ to over US\$ 384 billion at 2005–6 prices (US\$ 475 billion at current prices) for the same period. The financing gap is estimated to be US\$ 129 billion at 2005–6 prices (US\$ 162 billion at current prices) (GOI, 2007). Given a normative debt to equity ratio of 70:30, this translates to a whopping additional debt mobilization of US\$ 113.4 billion at current prices. This target can only be met if at least 50 per cent of the incremental savings in the economy are channelled to the infrastructure sector. While an appropriate policy and regulatory environment is evolving in various sectors

like power, telecom, roads, and airports, there is a need to improve access to financing.

The government funding of the infrastructure sector would remain constrained due to the Fiscal Responsibility and Budget Management Act 2003. The financing needs of the sector can be addressed if the sector is able to generate enough surplus for reinvestment and if there is a greater space for private including foreign participation. The inability to charge appropriate tariff and user charges, and poor operational and financial performance, especially in the government dominated sectors like electricity, continue to frustrate efforts to realize the former (Singh, 2007). This has justified a larger role for private and foreign investment in the sector. This has been facilitated through gradual policy and regulatory reforms since the opening up of the economy in the early 1990s.

The growing requirement for debt financing by the infrastructure sector projects cannot be fulfilled entirely

²⁸ Chatterton and Puerto (2006) estimated the required investment in the infrastructure sector in the South Asian countries between 2006 and 2010 is to be US\$ 88 billion per year, including India alone accounting for about US\$ 69 billion per year.

alone by traditional domestic financing. Project developers look outwards for greater borrowings from international markets. There is also a limit to the proposed utilization of forex reserves for lending to the infrastructure sector. In such circumstances, there is a need to find innovative methods for catalyzing investment in the infrastructure sector in the country. Securitization is a way out to 'recycle' the money lent by banks and financial institutions (FIs) to infrastructure projects. The lending to the infrastructure sector is for the long-term and remains locked there till the debt is repaid. Securitization and offloading the loans as marketable securities can help release funds for new projects. Securitization, a need-based innovation in the 1970s in the US helps to recycle debt financing. The enactment of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act (SARFAESI Act) in December 2002 paved the way for securitization in India. However, this has not made significant inroads into financing of infrastructure projects in the country.

The paper highlights the role of securitization in catalyzing infrastructure financing in the country. Some of the international experiences with respect to securitization for the infrastructure sector are discussed. The paper also highlights some of the related issues that need to be addressed for assisting this process.

EXPANDING PROJECT FINANCING TOOLS

There are two important issues that impinge on the financing of infrastructure projects. The first is the ability of the project developers to secure adequate debt financing and the other is to churn out sufficient risk capital for undertaking new infrastructure projects. Credit enhancement affects the ability of the project developers to seek debt financing. This is equally critical for a securitization exercise to assist infrastructure financing. In the spirit of securitization, there is also a need to make innovative use of capital markets to churn out availability of risk capital. This is being referred to as development of a secondary market for infrastructure projects by pooling a number of PPP projects.

CREDIT ENHANCEMENT

Credit enhancement mechanisms provide adequate security comfort to lenders for extending debt to infrastructure projects (Kumar et al., 1997). The need for credit enhancement arises in developing countries due to a variety of risks associated with infrastructure sector projects. These include the fundamental credit (default) risk, inflation and interest rate risk, liquidity concerns due to absence of a secondary debt market and concerns

due to political instability. A credit enhancement facility functions as an intermediary and is expected to reduce such risks for the lenders. Apart from lending to infrastructure projects in developing countries, the credit enhancement facilities like 'partial credit guarantee' and 'partial risk guarantee' further assist financing of infrastructure projects.

A number of domestic FIs and bilateral and multilateral institutions play a crucial role in providing credit enhancement. However, given the substantial financing requirement for the infrastructure sector, the capacity of the existing domestic FIs is limited. The governments also have limited scope to expand their security net to provide guarantees to infrastructure projects. There are fewer to come by in the future. The multilateral institutions can play a greater role in this context. Conceição et al. (2005) estimate that guarantees issued by such institutions to infrastructure projects in selected developing countries generated an efficiency gain of US\$ 22 billion.

A securitization process also needs to be credit enhanced for ensuring marketability of the securities. Some of the prevalent techniques for credit enhancement in a securitization process include guarantees, cash collateral, over collateralization and the issue of subordinate securities. Multilateral institutions have also played a catalytic role in this aspect. In 2005, IFC provided a partial credit guarantee for up to 30 per cent of the outstanding bond principal in the case of a US\$ 25 million securitization of current and future receivables of Corporación Drokasa, a leading Peruvian agricultural and industrial conglomerate (IFC, undated a). Another interesting case of securitization includes a US\$ 15 million bond issuance secured by future tuition fees with a seven-year maturity by a non-profit institution, the Universidad de San Martín de Porres (USMP), the largest private university in Peru. The bond issuance, which took place in 2005, was credit enhanced by IFC's partial guarantee for up to 30 per cent of the outstanding principal amount (IFC, undated b). Another example includes extension of guarantee by Multilateral Investment Guarantee Agency (MIGA) to MSF Funding LLC (MSF), whose parent company, MSF Holding Ltd., provides loan and lease financing for the supply of high technology diagnostic imaging and radiation therapy equipment throughout Latin America. The MIGA issued a US\$ 90 million guarantee for the securitization of loan and lease receivables from financing of medical equipment in Brazil.

There is a need to develop a dedicated national credit enhancement facility to support infrastructure financing including securitization of debt and receivables. Such a facility can be supported by bilateral and multi-lateral institutions. These can provide initial capital/reserve, a back-stop for contingency (through partial guarantees, contingent loans), parallel long-term loans, subordinated

debt or partial credit guarantee and political risk mitigation. This would also encourage foreign investors to take part in the establishment of a local credit enhancement facility (Kehew et al., 2005). Such a facility can fill the void due to the increasing absence of state guarantees, which can be targeted specifically to support social sector projects to be developed through public private partnerships.

SECONDARY MARKET FOR PPP PROJECTS

A large number of public private partnership (PPP) projects have contributed to the creation of public infrastructure facilities roads, bridges, waster water treatment plant, and other such urban infrastructure facilities. On a number of occasions, the size of the project is small and is often developed by a contractor-turned-BOT-operator. Such developers lack access to risk capital. Due to the nature of assets, the return on assets is generated over a long term and, hence, their capital is tied up in infrastructure projects. Due to small size and large transaction costs, such developers can not access capital markets. As an alternative, an SPV can pool a number of relatively homogenous assets like tolled road segments and securitize them to release the debt as well as risk capital. Homogeneity of assets is desirable as this enables a cost effective credit risk analysis of the pooled assets and to design securities with appropriate risk-return structure. Infrastructure sector specific mutual funds, if allowed to invest in such securities, can give a further boost to such an initiative.

Apart from this, there are a large number of small PPP projects where contractor-turned-BOT-operators have invested in developing infrastructure facilities like roads, bridges, waste water treatment plant, and other such urban infrastructure facilities. Due to their small size such project developers are not able to tap the equity market. Pooling of 'homogenous' projects could help lower the transaction costs and would also help recycling of risk capital²⁹ for investment in new infrastructure facilities.

This secondary market can be developed for projects that have completed the construction phase and have successfully begun commercial operation. During the operation phase, the risks associated with the projects tends to be relatively known and limited. Projects developers who have developed expertise in successfully undertaking project development, may be willing to take up new projects but for the lack of additional risk capital. Such promoters can use their unlocked equity for development of new infrastructure projects in the country.

²⁹ GOI (2007) also emphasized the need to improve the availability of risk capital such as mezzanine financing, subordinated debt, and private equity.

³⁰ RBI revised the definition of infrastructure sector through its circular DBOD.No.BPBC.67/21.04.048/2002-03 dated 4 February 2003 on Guidelines on Infrastructure Financing.

A number of national and state road projects and other similar facilities have been and are being financed by various multilateral institutions. Such assets can help raise funds for financing other infrastructure projects in the country. Since 1995, fifteen Chinese expressway companies and infrastructure developers have been listed on the stock exchanges in Hong Kong, Shenzhen, and Shanghai (UNESCAP 2006). In 1996, for instance, the Guangdong Provincial Expressway Development Company (GPED) issued US\$ 62 million foreign-currency denominated 'B' shares to be listed on the Shenzhen Stock Exchange (Nickensen and Stanfield 2000). Proven growth of toll revenues, a strategic partner from Malaysia, and the injection of two expressways and a major bridge to GPED's balance sheet provided added comfort to investors. In December 1997, the World Bank approved a policy guidance titled 'Securitization and other Capital Mobilization Transactions using Bank-or IDA-Financed Assets'. This paved the way for such initial public offerings of the highway assets financed by the Bank. Securitization has emerged a strong refinancing option for road infrastructure projects in China.

ISSUES IN INFRASTRUCTURE FINANCING

In India, the challenge to infrastructure financing comes both from within the sectors as well as from the domestic financial system. There are challenges to the ability of the domestic financial system to feed the sector with enough financial capital. We devote this paper to address some of the issues related to the later. Under government ownership, the investment needs of the sector were mostly met through budgetary provisions. With the increasing participation of the private sector and limit to government's budgetary support, there is a greater dependence on the domestic financial system. However, the existing regulatory provisions limit the ability of the banks and financial institutions to meet the requirement of the infrastructure sector (Table 2.3.1). The insurance companies also failed

TABLE 2.3.1
RBI Norms for Banks and FIs for Lending to
Infrastructure Sector³⁰

Single Company	Group
20 per cent of the capital funds for infrastructure projects #	50 per cent of the capital funds for infrastructure projects \$

Note: # 25 per cent with Board's approval; \$ 55 per cent with Board's approval; Capital funds includes Tier I & Tier II capital.

to meet their prudent investment norms with respect to the infrastructure sector.

The Insurance Regulatory and Development Authority (IRDA) prescribes a minimum³¹ share of investment by insurance companies in infrastructure and social sectors. One can note from Table 2.3.2 that the non-life insurance companies have invested more than the 10 per cent limit prescribed as minimum level of investment. In contrast, the life insurance companies have been lagging behind their minimum exposure limit of 15 per cent. If the latter is able to extend its investment to infrastructure and social sectors at least up to the prescribed limit, additional funds close to Rs 10,000 crore annually could be available from life insurance companies (Table 2.3.2). The Deepak Parekh Committee on Infrastructure Financing also notes that the absence of efficient credit risk transfer mechanisms such as securitization, credit derivatives, credit insurance and so on have constrained the growth of infrastructure sector investment by insurance companies (GOI, 2007).

The domestic bond market continues to be dominated by public borrowing and does not address the needs of the corporate sector as in the case of other emerging markets (Table 2.3.3). Further, the domestic corporate bond market faces a number of challenges. To help the development of the corporate bond market, a High Level Expert Committee on Corporate Bonds and Securitization recommended, among others, rationalization of stamp duty, enhancement of the investor base and introduction of exchange traded interest rate derivatives (GOI, 2005). In the context of the market for securitized debt, the committee also recommended listing of securitized debt and allowing specific mutual funds for large investors to invest in the market for securitized debt.

Foreign borrowing by domestic banks and FIs for on-lending to the infrastructure sector and refinancing of existing rupee loans are some of the opportunities to be explored in future. A proposal to utilize a part of the foreign exchange reserve for financing the infrastructure sector investment has been doing the rounds for a while.

TABLE 2.3.2
Investment by Insurance Companies in the Infrastructure and Social Sectors

(Unit: Rs Crore)

	Investment in Infrastructure and Social sectors	Total Investment	Share of Investment in Infrastructure and Social sectors (%)	Additional Potential Investment
Life insurers				
31st March 2006	49638.45	397188.65	12.50	9939.85
31st March 2005	45521.01	366219.85	12.43	9411.97
Non-life insurers				
31st March 2006	4981.88	39224.61	12.70	–
31st March 2005	4389.7	34764.58	12.63	–

Note: Additional investment potential estimated from actual investment data from IRDA (2006).

TABLE 2.3.3
Domestic Debt Securities in Emerging Economies (June 2006)

	Public	Private FIs	Corporate Entities	Total	Public	Private FIs	Corporate Entities	Total
	Billion US\$				Percentage Share			
All Issuers	21618.50	17546.40	5149.70	44314.60	48.78	39.60	11.62	100
Argentina	41.60	5.00	10.80	57.40	72.47	8.71	18.82	100
Brazil	409.50	108.40	4.80	522.60	78.36	20.74	0.92	100
PRC	340.30	252.50	12.50	605.30	56.22	41.71	2.07	100
India	268.00	7.30	3.80	279.10	96.02	2.62	1.36	100
Mexico	186.50	6.40	34.80	227.80	81.87	2.81	15.28	100
S. Korea	38.00	16.30	24.70	79.00	48.10	20.63	31.27	100
Thailand	226.00	277.00	152.60	656.70	34.41	42.18	23.24	100

Source: BIS (2006).

³¹ Interestingly, the exposure limit for Banks and FIs allow 'maximum' lending to the infrastructure sector, whereas in the case of insurance companies the limit is in terms of 'minimum' level of investment.

GOI (2007) proposed that only a small proportion (up to US\$ 10 billion) of the existing forex reserves could be utilized for such applications. The recent initiatives to allow infrastructure sector specific mutual funds to invest in unlisted securities of the infrastructure sector companies and to launch country-specific funds to mop up funds for the infrastructure sector would help in bridging the financing gap for the sector. In February 2007, Blackstone Group and Citigroup Inc launched a US\$ 5 billion equity-cum-debt infrastructure fund in partnership with IDFC and IIFCL for investment in sectors like roads and power. The government also plans to set up India-specific Infrastructure Equity Funds for each major investing country. These funds would be floated by domestic institutions like IDFC, IL&FS, UTI, AMC, and IIFCL under overarching government-to-government agreements. The Infrastructure Development Funds (IDFs),³² which bundle securities (debt and equity) issued by a pool of infrastructure projects, also provide securitization benefits to domestic as well as global investors.

The financing gap (US\$ 129 billion) in meeting the requirement of the infrastructure sector cannot be addressed alone through traditional methods of financing. While there are efforts to tap additional domestic as well as foreign funds, there is a need to access innovative methods³³ for catalyzing financing of the infrastructure sector in the country. Securitization can help to recycle the illiquid funds lent to infrastructure projects. The lending to the infrastructure sector is for a longer term and remains locked there till the debt is repaid. Securitization and offloading of debt in marketable securities would help release debt funds for new projects. Securitization has been applied to support financing of infrastructure sector projects in some of the developing countries especially in Latin America (Strong et al., 2004).

Chen and Kubik (2007) suggest that to support infrastructure financing, India needs to adopt a 'market finance' approach instead of the prevalent 'contract finance' approach. Privatization and securitization could help create immediate private ownership of public investment projects among diverse groups of investors, thereby supporting a more efficient and successful infrastructure development in the country. The next section explores the opportunities for securitization for improving the financing for the Indian infrastructure sector.

SECURITIZATION AND INFRASTRUCTURE FINANCING

Securitization refers to the process of transforming financial assets like debt or receivables into marketable securities. The cash flows already accruing or to accrue in future are used to guarantee and service the security. Traditionally, residential mortgages, auto loans, consumer loans, credit card receivables, leases, trade credits, corporate bonds and so on have been securitized to provide liquidity and help recycle the funds. Legal reforms to embrace securitization have been adopted by a number of countries (Global Legal Group, 2006). The enactment of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act (SARFAESI Act) in December 2002 paved the way for securitization in India.

Securitization offers two kinds of opportunities for catalyzing financing of investment in the infrastructure sector: (i) securitizing loans extended to infrastructure projects and (ii) securitizing receivables accruing or to accrue to an infrastructure project. Loans to infrastructure projects can be securitized in two ways: (i) refinancing of the loans extended by the banks/FIs themselves and (ii) pooling and securitizing the loans due to infrastructure project developers. In both the cases, the outstanding loan can be sold to an SPV, which would then issue securities to investors. Securitization offers following advantages for the infrastructure financing (RBI 1999; Giddy 2000):

- Improves availability of funds to the sector by recycling the locked up funds of banks and FIs due to regulatory provisions.
- Allows better asset management by lenders especially those with assets of short-term maturity.
- Allows a bank or projects to achieve greater leverage if securitization is structured as a true sale and asset is removed from the balance sheet.
- Reduces cost of funding the infrastructure projects.
- Expands investor base by issuing marketable securities.
- Sharing of risk by intermediaries/credit enhancing institutions involved in the process of securitization.
- Offers greater liquidity to investors than loans.
- Assists diversification of investor portfolios by participating in different classes of assets.

³² Such IDFs can be developed through the following design options—Discrete Pool, Quasi-Blind Pool, Construction Revolving Fund, and Insurance Funds. See Kumar et al. (1997) for details.

³³ Some of the other suggested innovations for infrastructure financing also include issuing stocks with a put option to safeguard downward risk and project stocks with contingent value rights (CVRs) to reap rewards on the upside (Chen and Kubik, 2007).

- Shifts the focus to the evaluation of credit risk rather than overall project risk as other components of project risk are borne by specialized intermediaries against a fee.
- Mitigates event risk on account of takeovers, restructurings, and other events that alter the credit status of senior unsecured corporate obligations.

Securitization of project finance loans could not only help project promoters to secure finance at a lower rate but also make the funds available to lenders for lending to other infrastructure projects (Strong et al., 2004; Forrester, 2001a; Giddy, 2000). Securitization arrangements provide significant benefits in terms of enhanced credit ratings and market liquidity for infrastructure projects (Kumar et al., 1997). Due to the asset-liability mismatch, commercial banks face a challenge in providing long-term project financing loans to infrastructure projects. Take-out financing and partial credit guarantees by FIs help extend the maturity profile for such loans. Alternatively, banks and FIs can securitize loans extended to infrastructure projects. This can help banks, FIs, and insurance companies to support larger investment in infrastructure projects even while limiting their exposure within the regulatory provisions set out by the RBI and the IRDA respectively. GOI (2005) also envisaged the entry of specialized SPVs to be set up for financing infrastructure in the securitized debt market. Such intermediaries can pool smaller assets and sell these in tranches with different ratings to suit investors' risk preference. Infrastructure projects are characterized by large, indivisible and immovable assets, which are designed for a specific need. This places a challenge to the securitization process, which banks on pooling of relatively large number of assets. Emergence of single-loan sell downs in the recent past (Fitch, 2006) raise hope for large infrastructure projects as well.

Securitization provides a potential for financing infrastructure projects that produce reliable revenue streams, which could be contractually assigned to a separate legal entity (Giddy, 2000). Apart from existing receivables, securitization has been applied in the case of future flow of receivables. This is known as future flow securitization. It has usually been implemented in various circumstances such as export receivables, air ticket receivables, lease rental, local tax revenues etc. Conceição et al. (2005) estimate that securitization of future flow receivables could generate efficiency gains worth US\$ 31 billion by low- and middle-income countries due to reduction in spreads. Latin American countries have extensively used future flow securitization especially during distress situations.

During 1990–2004, US\$ 64.8 billion worth future flow securitization deals were accomplished. Mexico and Brazil have dominated the scenario with US\$ 24 billion and US\$ 13.4 billion worth of future flow securitization respectively (Ketkar and Ratha, 2005). Export receivables from oil and mineral export, and remittances have often dominated future flow securitization.

Securitization is particularly appropriate when the project has completed the construction phase and is generating income from operation activities. The reduction in risk of the project makes it acceptable to a larger pool of investors. Receivables accruing or to accrue to infrastructure projects are spread over a long period of time and are usually backed by a concession agreement or a power purchase agreement. Further, partial risk guarantees by the government or the multilateral institutions help address the credit risk concern of investors. This makes applicability of future flow securitization suitable for the infrastructure projects. Table 2.3.4 provides an indicative list of future flow securitization opportunities in infrastructure projects.

The following case presents an early example of financing of a power plant by using a financial structure mimicking the future flow securitization. In 1999, the Larsen & Toubro (L&T) won a contract to build, lease, and operate a 90 MW captive power plant for Gandhar complex expansion undertaken by the Indian Petrochemical Corporation Ltd. (IPCL). The L&T chose to transfer the project to SPV, India Infrastructure Developers Ltd. (IIDL). The IIDL issued debentures for Rs 409 crore in the private placement market. These debentures are to be serviced from the lease rentals to be received from IPCL. The L&T's guarantee provided the much needed credit enhancement for the debentures, which were rated AAA by Crisil.

Perhaps the first large size securitization programme³⁴ for the Indian infrastructure sector was institutionalized to settle dues owed by the state electricity boards (SEBs) for purchase of power, coal, and rail transportation. The Ahluwalia Committee (GOI, 2001) recommendations led to a one-time settlement of dues through their securitization as state bonds worth Rs 31,581 crore were issued (Lok Sabha, 2006). 'Credit enhancement' was provided through a guarantee by the respective state government and the creditors' recourse to the state's plan allocations and its share of central taxes. The trading in bond was subject to lock-in-restrictions, which allowed the recipient utilities to trade only up to 10 per cent of the bonds in secondary market.

In the international context, there are a number of examples of securitization for the infrastructure sector.

³⁴ Although this materialized before the SARFAESI Act 2002, it has features of a standardized securitization process except that the securities were subject to restricted trading.

TABLE 2.3.4
Future Flow Securitization Opportunities in Infrastructure Sector

S. No.	Infrastructure Sector	Future Flow
1	Power	Receivables from bulk consumers. Meter rentals. Transmission tariff receivables from long-term customers.
2	Telecom	Phone rentals. Lease receipt from optical fibres. Lease receipt from active or passive telecom infrastructure such as telecom towers. Rentals/user charges from landing station in the case of telecom cable sea link.
3	Transport Infrastructure	Toll collection from commercial vehicles. Stowage and loading revenues levied on ships. Landing and parking fees for airports. Lease receipt from commercial use of air terminal space. Airline ticket receivables. Lease receipt from containers/rolling stock.
4	Coal, Oil & Gas	Revenue from sale of coal, oil, and gas. Royalty from mining and exploration.
5	Urban Infrastructure	Property tax collection by urban local bodies. User charges from a common effluent treatment plant. Lease receipt from infrastructure assets built using the financing.

These include revenue bonds issued by various US municipalities to finance public infrastructure facilities. The principle and interest payment to these bonds are secured by rentals or user charges to be collected from the facility being financed. In 2004, Hong Kong securitized toll revenues from state-owned tunnels and bridges by issuing HK\$ 6 billion of asset-backed-securities. The funds so raised are to be utilized for financing other infrastructure projects (Jobst, 2006).

Securitization has been used to pay for the stranded cost following deregulation in the US electricity supply industry. TXU, the Texas electric utility, issued US\$ 790 million medium-term debt securities through the TXU Electric Delivery Transition Bond Co LLC in May 2002 to recover stranded-cost debt. In another case, the California Public Utilities Commission (CPUC) approved financing orders to allow California's three investor-owned utilities to issue US\$ 7.3 billion worth of bonds to recover their investment in stranded assets. Between November 1997 and 2002, twenty-five such deals in ten US states led to securitization of US\$ 30 billion in stranded costs. These securities were rated AAA due to an airtight repeated structure wherein a mandatory charge was built into the consumer's utility bills without resorting to an explicit payment guarantee (Gelinas, 2004). In 2004, the Depfa Bank securitized £ 391.7 million (Euro 560 million) of its UK Private Finance Initiative (PFI) senior loans, thereby freeing up capital for lending in the public infrastructure market (Archer and Guadagnuolo, 2005).

Early examples of securitization of project finance loans to a power project also include the US\$ 560 million

financing for Coso Funding arranged by Lehman Brothers in 1994. Cash flows from three geothermal power projects were used to support the Coso Funding notes (Forrester, 2001a). A single project example includes the case of a sale and leaseback of a 1340 MW natural gas-fired, cogeneration project financing by Midland Cogeneration Venture L.P. The company, through two special purpose entities, Midland Funding Corporations I and II issued over US\$ 2 billion of senior and subordinated secured lease obligation bonds to refinance the original project financing and to return capital to the project sponsors (Forrester, 2001a).

In the background of above experiences, the opportunities to apply the securitization process to assist financing of infrastructure projects in India seem promising. The upcoming UMPPs require an investment of about Rs 16,000 crore each. The opportunities to finance such projects partially through the securitization of debt and future cash flows could promise some comfort to investors. This, however, needs to be supported with appropriate credit enhancement, which can be provided by domestic FIs as well as by the bilateral and multilateral institutions. Given the scale of investment required for the proposed nine UMPPs during the 11th and 12th Five Year Plans, securitization opportunities need to be seriously considered. Similarly, the proposed Delhi–Mumbai rail corridor, the ongoing and upcoming airport modernization projects and the greenfield airports could also be supported through debt and future flow securitization. In the case of small projects like national or state-level road projects, standardization of contractual details can help in pooling

such assets for the ease of securitization. An SPV can securitize debt or the future receivables by pooling a certain class of assets based on the risk associated. For instance, projects with toll-based revenue stream can be classified as relatively risky assets³⁵ as compared to those supported through shadow tolling or a viability gap funding.

Securitization can be implemented in infrastructure sectors either by lenders or by project developers themselves. Lenders in a project finance deal can securitize and sell off a relatively homogeneous part of their project finance portfolio. Alternately, project sponsors could securitize a pool of their project assets. Homogeneity of a pool of assets is desired from the point of view of investors' ability to ascertain the risk of loss amongst a pool of assets held by large number of sellers. Further challenge arises as projects tend to face different risks to a varying degree and may have different contractual structures even if they belong to the same sector. In this context, it is desirable that there be homogeneity in infrastructure contracts being awarded in the country for a particular type of sector. There are efforts underway to harmonize model concession agreements for infrastructure projects in states in line with that adopted for NHAI projects. Such harmonization would also assist the rating of securities. Significant diversity in projects would multiply the rating agencies' task to evaluate the securitized assets. Further, pooling of assets would be easier if projects are passing through a similar risk phase. For example, projects

undergoing construction cannot be easily bundled with those already under operation. Similarly, the assets bundled together may also have very dissimilar residual period of concession or power purchase agreement.

CONCLUSIONS

As India is keen to develop large infrastructure projects where the private sector is expected to raise funds from the market, there is need to develop new financial instruments for the debt market as well as for risk capital. Securitization of debt allows banks and FIs to recycle their funds quickly rather than locking them up for years together. Risk capital for large projects is also scarce as a few 'small' contractors are becoming developers and do not have enough risk capital. An appropriate regulatory environment should help assist development of securitization market as per the needs of the infrastructure sector.

The paper suggests that there are substantial opportunities for securitization to assist financing of large infrastructure projects like Ultra Mega Power Projects (UMPPs), Delhi–Mumbai rail corridor, airport modernization, and greenfield airports. Similarly, innovative solutions are also applicable by pooling in small infrastructure projects like roads, bridges and so on. However, these could deliver results only if there is adequate credit enhancement available for such securities and there is some level of standardization to assist pooling of assets.

2.4

Evaluation of Demand and Reform Based Centrally Sponsored Programmes

Ravikant Joshi³⁶

INTRODUCTION

The Accelerated Power Development and Reform Programme (APDRP) and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) are two prominent centrally sponsored schemes with sector specific focus on the power sector and urban infrastructure respectively.

Central government assistance to both is incentive-based and available to states or urban local bodies (ULBs) conditional upon certain reforms being carried out.

The key objective of reforming the power sector was to stem the alarming losses being incurred by the State Electricity Boards (SEBs) and making adequate, affordable, quality power universally available on a sustainable

³⁵ This is rather a simplified scenario, the uncertainty associated with the traffic projections, composition of traffic, and competing transportation avenues would also influence the risk associated with a project.

³⁶ I would like to thank Chetan Vaidya, Ramesh Ramanathan, and Manju Ghodake for providing valuable suggestions to an earlier draft of this paper. However, the views expressed in the paper are solely mine.

basis. This rather ambitious objective called for fundamental changes in the way the power sector was structured and the policy framework within which it was governed. The reform process in the sector is still ongoing within which many states have successfully and progressively transformed the sector performance within that state with active support from the centre.

Similarly, the urban renewal mission aimed at improving the quality of life in urban India with a special focus on the urban poor, by ensuring their basic entitlements to identified opportunities and services. Within the JNNURM, ULBs are geared to rediscover their inherent financial, technical, and human potential through the implementation of a predefined set of reform measures together called the Common Urban Reform Elements (CURE). ULBs are incentivized to focus on pro-poor services, through a demand-driven, community partnering framework, and finally, repositioned to respond to the new challenges of a rapidly expanding urban populace.

THE GENESIS OF APDRP

The financial health of SEBs became a major cause for concern once their losses reached staggering proportions at Rs 26,000 crore during 2000–1, which was equivalent to about 1.5 per cent of GDP. Accelerated Power Development Programme (APDP) was undertaken in the year 2000–1 as a last means to restore the commercial viability of the power distribution sector. Since incentive financing linked to the reform process was proposed to be integrated with the existing investment programmes to achieve commercial viability of SEBs or power utilities, the original APDP was rechristened the Accelerated Power Development and Reforms Programme in 2002–3.

The APDP was a scheme with diffused focus that sought to achieve improvements in too many things at the same time—generation, transmission, and distribution. Its emphasis was on inputs and projects as opposed to outcomes. The programme made heavy demands on the centre in terms of project selection and monitoring and was to be monitored by the Power Finance Commission (PFC). Many projects awaiting clearance under other schemes of PFC and the Rural Electrification Corporation (REC) found their way into the APDP. Disbursements linked to signing of MoUs were ineffective. State governments happily flouted rules, including the critical ones such as creating a ‘ring-fenced’ account for APDP funds.

The failure of the APDP led to the adoption of more focused measures that were likely to achieve the objectives of sustainable power provisioning. Drawing upon the experience of Orissa’s privatization model, the reforms were planned in two phases. The first phase was to

improve internal functioning by metering, transparency of processes, smooth information exchange and so on; and the second phase was to achieve structural and regulatory changes by privatization of distribution, multi-year regulation, abolition of a single buyer model among other elements.

The main objectives of APDRP are:

1. Improving financial viability.
2. Reduction of T&D losses to around 10 per cent.
3. Improving customer satisfaction.
4. Increasing reliability of power supply.
5. Improving quality of supply.
6. Adopting systems approach with MIS.
7. Bringing transparency through computerization.

The APDRP scheme has two main components: investment and incentives.

INVESTMENT COMPONENT

For purposes of strengthening and upgradation of sub-transmission and distribution network, the centre provides additional central assistance (ACA) in the form of grants to the state utilities to the tune of 25 per cent of project cost. Initially a loan of another 25 per cent of the project cost was also offered. However, in accordance with the recommendations of the 12th Finance Commission, the loan component was discontinued from 2005–6. Now utilities have to arrange the remaining 75 per cent of the project cost either from their own resources or through financial institutions (FIs) such as PFC or REC. Special category states (NE states, J&K, HP, Uttarakhand, and Sikkim) are entitled up to 90 per cent assistance.

For availing funds under the investment component of APDRP, project proposals are prepared by state utilities in the form of Detailed Project Reports (DPRs) which are reviewed by Advisor cum Consultants (AcCs) and then considered and sanctioned by the APDRP Steering Committee on merit. APDRP is an instrument to leverage distribution reforms in the states. Therefore, priority is given to projects from those states which have committed themselves to a time-bound programme of reforms as elaborated in the memoranda of understanding and agreement and are making progress on those commitments.

INCENTIVE COMPONENT

An incentive equivalent to 50 per cent of the actual cash loss reduction by SEBs/utilities is provided as grant. The year 2000–1 is the base year for the calculation of loss reduction in subsequent years. The cash losses are calculated net of subsidy and receivables.

RESULTS

During the 10th Plan period (2002–7), planned outlay of APDRP under the two components was Rs 40,000 crore: Rs 20,000 crore for strengthening and upgradation of sub-transmission and distribution network under the investment component and grants of Rs 20,000 crore to the states for reduction in cash losses by SEBs/utilities under incentive component.

All states have signed MOUs with the Ministry of Power (MOP) to take steps to undertake distribution reform in a time-bound manner. Subsequently, twenty-five states have constituted State Electricity Regulatory Commissions (SERCs) and twenty-one have issued orders towards rationalizing tariff structures. States are now more committed to subsidy payments to utilities. Tables 2.4.1 and 2.4.2 present financial outcomes of the programme.

The analysis of financial outcomes indicates that APDRP did not succeed in achieving its objectives. In its primary objective of reducing technical and commercial losses to less than 15 per cent, APDRP failed miserably. The Aggregate Technical and Commercial losses (AT&C) continue to remain unacceptably high at over 35 per cent and they range from 18–62 per cent across states. In terms of the second objective of improving financial viability

of SEBs, one notices a very slow progress—the rate of returns on SEBs deteriorated to minus 27.4 per cent in 2006–7 from minus 24.8 per cent in 2005–6.³⁷

In terms of investment component, against the target of Rs 40,000 crore (Rs 20,000 crore by GOI plus Rs 20,000 crore by state and SEBs) projects worth Rs 17,034 crore were sanctioned (42.5 per cent of planned outlay) against which GOI released Rs 7203.44 crore. The actual expenditure was little and stood at Rs 10,810.54 crore (27 per cent against planned outlay). The final utilization figure also indicates that GOI has released funds but state governments have not added their share and many projects are incomplete.

In terms of the incentive component it was envisaged that states/SEBs would wipe out losses of Rs 40,000 crore which was securitized and claim Rs 20,000 crore as incentive grant from GOI. By end of March 2007, Rs 1749.03 crore were distributed as incentive grant as SEBs had succeeded in reducing their loss by a mere Rs 5255 crore—just 13 per cent of the planned loss reduction. Even this 13 per cent reduction rate has withered away and utilities, both private and state-run, which reduced losses in initial years and claimed incentive, have shown sizeable loss increases in the last two years.

Not surprisingly, APDRP is being revised again. Though the objective of the revised APDRP remains that

TABLE 2.4.1
Cash Loss Reduction and Incentives Released to Various States under APDRP

(as on 31 March 2007)

Sl. No.	State	Claim Year	Cash loss Reduction (Rs in crore)	Eligibility (Rs in crore)	Incentive Released (Rs in crore)	Incentive Release Year
1.	Gujarat	2001–2	472.74	236.38	236.38	Prior to 2005
		2002–3	296.16	148.08	148.08	2005–6
		2004–5	733.64	366.82	76.87	2006–7
		Sub-total	1502.56	751.28	461.33	
2.	Maharashtra	2001–2	275.78	137.89	137.89	Prior to 2005
3.	Haryana	2001–2	210.98	105.49	105.49	Prior to 2005
4.	Rajasthan	2001–2	275.78	137.71	137.71	Prior to 2005
5.	Andhra Pradesh	2002–3	530.22	265.11	265.11	Prior to 2005
6.	West Bengal	2002–3	146.00	73.00	73.00	Prior to 2005
		2003–4	605.52	302.76	302.76	2005–6
		2004–5	11.76	5.88	5.88	2006–7
		2005–6	230.20	115.10		
	Sub-total		993.48	496.74	381.74	
7.	Kerala	2002–3	129.88	64.94	64.94	2005–6
		2004–5	159.94	79.97	31.44	2006–7
8.	Madhya Pradesh	2001–2	77.44	38.72		
		2003–4	595.02	297.51	54.06	2006–7
9.	Punjab	2003–4	503.88	251.94	65.28	2005–6
					44.14	2006–7
Total			5254.60	2627.30	1749.03	

³⁷ It was negative 32 per cent in 2004–5.

TABLE 2.4.2
APDRP Investment Status as on 31 March 2007

S. No.	State	Project Quality	Nos of Projects	Revised APDRP Component		APDRP Funds		Funds Available with Stress		Utilization			C/Part Fund drawn	
				Grant	Loan	Total	Transferred	Total	Funds Released under APDRP		Up to 2006-7	Total		%
									Up to 2006-7	Total				
<i>Non-Special Category State</i>														
1	Andhra Pradesh	1127.12	100	281.78	283.38	565.16	566.76	566.76	566.76	961.34	85	744.78	466.45	
2	Bihar	823.15	15	205.79	156.59	362.38	11.85	313.18	325.03	179.00	59	377.75	250.57	
3	Chhattisgarh	353.33	7	88.33	79.61	167.94	159.21	159.21	159.21	64.57	56	65.99	65.99	
4	Delhi#	211.02	2	52.76	52.76	105.51	105.51	105.51	105.51	211.02	100	105.51	105.51	
5	Goa	288.94	7	72.24	56.70	128.94	64.26	400.26	464.52	160.62	62	62.70	44.87	
6	Gujarat	1083.22	13	270.81	200.13	470.94	17.06	168.99	186.05	20.78	90	480.54	372.44	
7	Haryana	431.95	18	107.99	84.50	192.48	21.97	153.87	175.84	71.33	54	225.34	107.28	
8	Jharkhand	423.65	8	105.91	76.94	182.85	447.97	447.97	463.62	49.56	51	222.42	65.54	
9	Karnataka	1186.31	35	296.58	217.73	514.30	230.55	230.55	248.57	49.56	72	668.97	587.34	
10	Kerala	858.50	52	214.63	115.28	329.90	18.02	230.55	18.02	129.17	49	175.18	159.12	
11	Madhya Pradesh	663.20	48	165.80	64.94	230.74	129.87	129.87	178.70	98.21	43	339.54	177.37	
12	Maharashtra	1643.12	34	410.78	134.12	544.90	53.67	349.01	77.77	234.65	58	713.64	376.62	
13	Orissa	206.73	4	51.68	37.01	88.69	0.99	74.02	75.01	11.21	20	296.11	35.52	
14	Punjab	715.57	26	178.89	89.37	268.26	17.67	178.74	23.93	83.94	51	353.19	211.59	
15	Rajasthan	1193.25	29	298.31	192.92	491.23	13.11	385.83	48.45	47.04	64	557.79	499.86	
16	Tamil Nadu	948.12	41	237.03	220.91	457.94	441.82	441.82	441.82	724.14	76	484.09	392.77	
17	Uttar Pradesh	1069.25	35	267.31	67.26	334.57	12.32	174.01	119.69	383.72	82	871.66	632.68	
18	West Bengal	441.85	20	110.46	20.09	130.55	22.40	92.92	115.32	324.20	73	210.29	113.96	
Total		13668.28	494	3417.07	2150.19	5567.26	235.30	4485.92	352.34	1682.03	66	6955.49	4665.48	
<i>Special Category State</i>														
19	Arunachal Pr.	82.69	4	74.42	3.67	78.09	6.32	36.68	43.00	20.78	40	47.07	47.07	
20	Assam	650.73	15	585.66	15.89	601.54	15.60	278.51	115.84	145.07	58	47.07	47.07	
21	Himachal Pr.	322.77	12	290.49	16.39	306.89	242.33	242.33	64.55	92.11	95	15.88	15.88	
22	J&K	1100.13	6	990.12	31.50	1021.61	408.50	408.50	593.39	68.92	34	15.88	15.88	
23	Manipur	141.62	5	127.46	0.27	127.73	2.67	2.67	42.76	2.67	2	15.88	15.88	
24	Meghalaya	227.44	9	204.70	5.84	210.53	58.38	58.38	32.07	45.77	38	15.88	15.88	
25	Mizoram	108.74	7	97.87	2.90	100.76	78.01	78.01	78.01	39.13	63	15.88	15.88	
26	Nagaland	122.27	3	110.04	4.28	114.33	68.58	68.58	2.86	21.97	53	15.88	15.88	
27	Sikkim	152.09	3	136.88	15.47	152.35	154.73	154.73	154.73	17.26	100	15.88	15.88	
28	Tripura	146.74	7	132.07	3.76	135.83	5.00	37.64	16.67	32.82	39	15.88	15.88	
29	Uttarakhand	310.08	6	279.07	24.08	303.15	279.76	279.76	279.76	10.22	74	15.88	15.88	
Total		3365.30	77	3028.77	124.04	3152.81	26.92	1645.79	456.97	494.05	52	62.95	62.95	
Grand Total		17033.58	571	6445.84	2274.23	8720.07	262.22	6131.71	809.31	2176.08	63	7018.44	4728.43	

Note: # Fund to Delhi is released by Ministry of Home Affairs.

of reduction in high T&C losses of state utilities,³⁸ it has been officially acknowledged by the government that the original APDRP—under which Rs 7200 crore have already been released—did not succeed in cutting down the losses significantly. Experts blamed ‘too many pre-conditions’ for the failure of the programme, under which states were supposed to unbundle their utilities, set up state electricity regulatory commissions (SERCs) and ensure 100 per cent metering. The revised programme, on the other hand, lays stress on only one parameter—that states have to improve their collection efficiency, irrespective of whether they have unbundled their boards or have set up a regulator or not. Earlier, 25 per cent of the loan component of states could be converted into grants if the target was achieved. In the revised programme, if a state exceeds a certain percentage (yet to be decided) of collection efficiency, the entire loan amount would be converted into a grant, said a senior government official associated with the programme.

JNNURM

The JNNURM (Jawaharlal Nehru National Urban Renewal Mission) scheme was announced on 3 December 2005 for a duration of seven years (2005–11) with a planned outlay of Rs 50,000 crore as an ACA to state governments for sixty-three selected cities which included thirty-five cities with 10 lakh plus population, state capitals³⁹ and twenty-eight special cities. GOI has also formulated the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) on similar lines with Rs 50,000 crore planned outlay as an ACA to state governments for over 4000 agglomerations identified as small or medium towns. In this paper we shall evaluate JNNURM only.

The JNNURM has the following objectives:

1. To ensure that cities generate outcome-oriented pro-poor plans through participatory processes.

2. To pool all relevant GOI programmes/schemes into a centralized Mission Fund, which can be enhanced.
3. To use Mission funding to focus on supporting services for the poor.
4. To link fund disbursement with performance parameters.
5. To secure effective linkages between asset creation and asset management so that the infrastructural services created in the cities are not only maintained efficiently but also become self-sustaining over time.
6. To develop cities in a well-planned manner to include peri-urban areas, outgrowths, and urban corridors, so that urbanization is dispersed.

Infrastructure projects admissible under JNNURM are:

1. Water supply and sanitation, including de-salination plants, where necessary.
2. Sewerage and solid waste management.
3. Hospital waste management.
4. Laying/improvement/widening of arterial/sub-arterial roads and bridges to remove transport bottlenecks.
5. Urban transport and construction and development of bus and truck terminals.
6. Environmental improvement and city beautification schemes.
7. Construction of working women hostels, marriage halls, old age and destitute children’s homes, night shelters with community toilets.
8. Street-lighting.
9. Slaughter houses.
10. Civic amenities like playgrounds/stadiums, community halls.

Financing of the projects under the JNNURM is proposed in a manner, which fulfils the JNNURM objectives and promotes PPPs in the creation of urban infrastructure (Table 2.4.3).

TABLE 2.4.3
Structure of Project Finance under JNNURM by Source of Assistance

	Grant		Loan
	Centre	State	from FIs
Cities with 40 lakh plus population as per 2001 census	35	15	50
Cities with population less than 40 lakh but at least 10 lakh as per 2001 census	50	20	30
Other cities	80	10	10
For setting up de-salination plants within 20 km from the sea-shore and other urban areas predominantly facing water scarcity due to brackish water and non-availability of surface source	80	10	10

³⁸ The national average of AT&C losses is still 34 per cent, with some states, like Jharkhand and Bihar, reporting losses of over 50 per cent. The revised APDRP aims at bringing these down to less than 15 per cent.

³⁹ It mysteriously omitted ‘Gandhinagar’, the capital of Gujarat.

In order to be eligible for assistance, respective ULBs and state governments have to undertake a set of mandatory reforms. In case of ULBs such reform includes full O&M cost recovery over five years, accrual accounting, e-governance, and pro-poor budgeting as important elements. Similarly, mandatory reforms for states include repeal of Urban Land Ceiling and Regulation Act (ULCRA) 1976, reform of rent control laws, independent regulators for urban services, and so on. In addition, states and ULBs are required to implement any five optional reforms in the first year which include implementation of the voluntary retirement Scheme (VRS), by-laws for rain water harvesting and computerization of land title system.⁴⁰

Each assistance-seeking ULB would also be required to prepare a City Development Plan (CDP), based on a Rapid City Assessment (RCA). The RCA is expected to help the ULB to (a) develop a vision for its city; (b) ascertain the gap between infrastructure and investments; and (c) set out priorities, sequencing, and timelines for undertaking various reforms and investments. While preparing its CDP, the ULB is expected to pay particular attention to three key aspects, namely, delivery of services, governance and financing, and identification of investment projects for assistance under the Mission.⁴¹ The CDP and DPRs (for proposed investments) shall be used to formulate a Memorandum of Agreement (MoA) between the ULB, state, and the centre. The tripartite MoA, in a multi-year framework will set out reform targets and milestones to be achieved by ULBs/states, GoI funding commitments and procedures for monitoring, evaluation, disclosure, and dispute resolution.

The 25 per cent central assistance will be available on signing of tripartite MoA; the rest will be released on the attainment of benchmarks stipulated and agreed in MoA regarding physical performance, service delivery, and reforms implementation. The prime objectives of the programme are planned development, and integrated development of infrastructure. It aims to create and nurture linkages between asset creation and management, ensure adequate investment of funds, scaling up delivery of services with emphasis on universal access, and renewal of inner city areas. The admissible sectors, projects and components that come within the purview of the Mission are: urban renewal, water supply (including desalination and sewerage), solid waste management, storm water drains, urban transport, parking spaces on PPP basis, development of heritage areas, prevention and rehabilitation

of soil erosion (only in case of Special Category States), and preservation of water bodies. Inadmissible sectors include power, wage employment and staff components, telecom, health, and education. The Ministry of Urban Development (MUD) and Ministry of Urban Environment and Poverty Alleviation (MUEPA) and two sub-Missions—(i) Urban Infrastructure and Governance, and (ii) Basic Services for the Urban Poor (BSUP)—through dedicated Mission Directorates will administer it.

JNNURM strategy for successful attainment of scheme objectives mainly comprises of three elements:

1. City Development Plan: A vision document that defines where the city wishes to go and lays down alternate routes for getting there.
2. Detailed Project Reports: These provide detailed account of technology selected, engineering plans, estimates of quantity, implementation plans, social and environmental impact analyses, performance benchmarks, financial plans, and so on for specific projects admissible under the JNNURM. Through DPRs:
 - (a) Spheres and sectors for support are defined.
 - (b) Project-fit with CDP framework is established.
 - (c) Financial and technical viability of the project is evaluated.
 - (d) A clear financing structure for each project is presented.
3. Reform plan with time frames: JNNURM is not a free lunch. Assistance for investment is contingent upon the attainment of various mandatory and optional reforms by ULBs and respective state governments. The reforms to be undertaken are as follows:
 - (a) Mandatory reforms for ULBs:
 - (i) Accrual-based double entry system of accounting.
 - (ii) Introduction of system of e-governance using IT applications like, GIS and MIS for various services provided by ULBs.
 - (iii) Reform of property tax with GIS, so that it becomes a major source of revenue.
 - (iv) Levy of reasonable user charges (full recovery of O&M costs).
 - (v) Internal earmarking within local body budgets for basic services to the urban poor.
 - (vi) Provision of basic services to urban poor including improved housing, security of tenure at affordable prices, water supply,

⁴⁰ <http://urbanindia.nic.in/mud-final-site/programs/urbandevelopment/nurm.htm>

⁴¹ Even before the JNNURM was approved by the Cabinet, cities were already busy in preparing CDPs. Municipal Corporation of Mumbai invited Expression of Interest in September 2005 for preparation of CDP and city investment plan for Mumbai city from organizations of national/ international repute (www.mcgm.gov.in/Tenders/tdr11136.PDF).

sanitation, and ensuring delivery of other existing universal services of the government for education, health, and social security. These works must be given a minimum of 35 per cent share of the funds going to be spent under JNNURM.

- (b) Mandatory reforms for state governments:
 - (i) Implementation of 74th Constitution Amendment Act 1992.
 - (ii) Enactment of Public Disclosure Law.
 - (iii) Enactment of Community Participation Law.
 - (iv) Assigning or associating elected ULBs with the 'city planning function'.
 - (v) Repeal of the ULCRA 1976.
 - (vi) Reform of Rent Control Laws balancing the interests of landlords and tenants.
 - (vii) Rationalization of Stamp Duty to bring it down to no more than 5 per cent within next five years.
- (c) Optional Reforms (states and ULBs/parastatals): any two optional reforms to be undertaken per year:
 - (i) Revision of by-laws to streamline approval process for construction of buildings, development of sites and so on.
 - (ii) Simplification of legal and procedural frameworks for conversion of agricultural land for non-agricultural purposes.
 - (iii) Introduction of Property Title Certification System.
 - (iv) Earmarking at least 20–25 per cent of developed land in all housing projects (both public and private agencies) for Economically Weaker Sections/Lower Income Group (EWS/LIG) category with a system of cross subsidization.
 - (v) Introduction of computerized process of registration of land and property.
 - (vi) Revision of by-laws to make rain water harvesting and adoption of water conservation measures mandatory in all buildings.
 - (vii) By-laws for reuse of recycled water.
 - (viii) Administrative reforms.
 - (ix) Structural reforms.
 - (x) Encouraging PPP.

IMPLEMENTATION AND ACHIEVEMENTS OF JNNURM

Since JNNURM has just completed two years of its planned seven years project life, any conclusion drawn about its success or failure would be premature. Still, this analysis is very important to project the trajectory of its

future performance, and to identify early warning signals. The following paragraphs trace the achievements till July 2007. For the year 2005–6, budget provision was Rs 500 crore and for 2006–7, GOI provided Rs 2500 crore for urban infrastructure and Rs 1000 crore for the BSUP component. For the year 2007–8 GOI has made provision of Rs 2805 crore for urban infrastructure and Rs 1322.34 crore for BSUP.

To qualify for JNNURM assistance the ULB must, first and foremost, prepare and submit a CDP. All ULBs (sixty-three) cities have prepared and submitted CDPs to MUD for assistance under JNNURM. MUD has already appraised fifty-nine CDPs and four CDPs are under appraisal. But in case of mega cities like Mumbai and Kolkata MUD has appraised CDP of main ULB but there exist several ULBs and other parastatals which are in the process of formulating CDPs as a result of which the investment figure is likely to be revised upward.

In the second step involving negotiation of the reform agenda and then signing of the tripartite MoA, out of fifty-nine CDPs appraised, in fifty-four cases reform agenda has been negotiated and MoA has been signed.

Getting ULBs to prepare and submit CDPs, subsequently getting state governments and ULBs to agree on reform agenda in order to sign the tripartite MoA is a massive task and a commendable achievement on the part of both MUD and MUEPA. It clearly reflects the catalytic strength for change that JNNURM has provided and the incredible effort put in by the teams working in both ministries. Otherwise repeal of the ULCRA, amendment of the rent control laws, or reduction stamp duty rates would have been impossible to obtain. In addition, the state governments actually agreed to provide greater autonomy to ULBs and release more for them! However, as is true for many things achieved in a hurry, the quality of CDP preparation, appraisal, and the setting of performance benchmarks in the MoA have been compromised. Consequently, the really difficult issues of implementation have started to emerge.

Annexe A2.4.1 provides data as they are provided in the respective CDPs by ULBs, but it can be observed from the table that the data are inconsistent particularly with reference to sharing of investment by GOI, state and ULB. Annexe A2.4.2 has been worked out keeping in account MUD guidelines regarding sharing of investment. Analysis of reworked data reveals that total investment proposed by ULBs of cities (excluding four mega cities and four small cities as their data are not available) is around Rs 188,463 crore. GOI investment share is around Rs 108,968 crore against Rs 50,000 crore envisaged under JNNURM. If we include investment proposed by four mega cities and other non-municipal agencies then total investment proposed or required figure will be a staggering Rs 300,000

crore and GOI share will be more than Rs 160,000 crore. These figures or their sheer size clearly indicate the absurdity of investment proposed by ULBs through CDPs.

If investment proposed is analysed in per capita terms then as we move away from financially strong ULBs (A category) to financially weak ULBs (C and D category); the investment and borrowing proposed by them gets more and more illogical—not backed by financial capability or sustainability. Financially solvent ULBs (A group⁴²) have proposed an average per capita investment of Rs 21,573 and financially average (B group) have proposed Rs 27,219 while financially weak or ULBs without very low sustainability have proposed per capita investment at around Rs 31,493 and finally, cities from north eastern states and J&K with no financial viability, have proposed per capita investment at a staggering level of Rs 80,578. These are the average figures for the groups of ULBs and under each group there are ULBs which are more extreme than the others (these figures do not include investments proposed by non-municipal urban service delivery agencies).

TABLE 2.4.4
Per Capita Investment Proposals of ULBs

Group A ULBs:	Thiruvananthapuram Rs 83,000, Cochin 81,055, Vishakhapattanam Rs 65,800 per capita CAPEX
Group B ULBs:	Puri 116,400, Mathura Rs 60,900, Kanpur Rs 50,140 per capita CAPEX
Group C ULBs:	Dehradun Rs 86,700, Ranchi 64,800 per capita CAPEX
Group D North: East ULBs	Gangtok Rs 764,700, Itanagar Rs 482,800 per capita

It may be argued by some that the cities which are underdeveloped will naturally require more per capita CAPEX. Though this argument is true as a generic principle, the data are fairly demonstrative of its own absurdity. Absorption and fiscal sustainability of the proposed investment should be the real acid test compared to size and per capita basis of investment. Table 2.4.5 provides a summary of investment sustainability analysis from various angles.

It can be observed from Table 2.4.4 that in general, the investment proposed is unsustainable and it becomes progressively unrealistic as we move from the financially strong to the financially weak ULBs.

In all, fifty-two cities have submitted 541 DPRs pertaining to urban infrastructure improvement, out of which 240 DPRs have been appraised and 212 projects involving outlay of Rs 17,660 crore have been approved for release of ACA. Against this, GOI has committed a total assistance of Rs 8589 crore. By the end of March 2007, GOI released Rs 1621.45 crore (at the rate of 25 per cent) against the amount of Rs 1771.40 crore which it should have released as first instalment.

Under BSUP forty-two cities of nineteen states submitted 225 DPRs of Rs 13,280 crore outlay out of which 166 projects involving cost of Rs 9872 crore have been approved for release of JNNURM assistance. Against this, GOI has committed total assistance of Rs 4957 crore. By the end of March 2007, GOI released Rs 974 crore against the first instalment (at the rate of 25 per cent) of Rs 1240 crore.

TABLE 2.4.5
Analysis of Sustainability of Investment Proposed by ULBs for JNNURM Assistance

Categories of City	Popu- lation in lacs	Average per capita revenue in 2004–5 (in Rs)	Average per capita revenue surplus (in Rs)	Average per capita CAPEX pro- posed (in Rs)	Total Invest- ment Pro- posed (in Rs crore)	Sustain- able invest- ment (in Rs crore) ⁴³	Ratio of pro- posed invest- ment to sustainable investment	Ratio of proposed investment to current annual revenue income
Group A2 Investment Grade 23 Cities	421	1527	474	21573	90822	40030	2.27	2.35
Group B Low or Speculative Investment Grade 15 Cities	183	540	70	27219	49811	2777	17.94	8.80
Group C No Investment Grade 10 Cities	70	184	negative	31493	22045	60	367.42	28.43
Group D No Investment Grade 13 Cities	32	312	negative	80578	25785	189 ⁴⁴	136.46 ⁴⁵	256.92
Total 61 Cities	705	1085	293	26732	188463	43056	4.38	24.65

⁴² ULBs have been grouped on the basis of their revenue surplus, population, and their respective state size, level of urbanization, and financial health.

⁴³ It is assumed that cities with JNNURM assistance and reforms implementation will be able to undertake investment up to twenty times of their per capita revenue (operative) surplus.

⁴⁴ Jammu data seem doubtful.

⁴⁵ Group C and D category cities do not have operative surplus and so they do not have the capacity to sustain investment.

So it is evident that against the total commitment of Rs 50,000 crore ACA, at the end of the second year, GOI has committed ACA of Rs 13,546 crore or 27 per cent of the total amount that may be released over the next five years. At this pace it seems that JNNURM may be able to receive adequate number of DPRs from ULBs and hopefully will be able to commit promised ACA of Rs 50,000 crore.

While the macro picture is not too bleak, closer scrutiny reveals critical flaws that jeopardize the benefits people hope to draw from the JNNURM. In the first place JNNURM (FY 2005 to 2011) started late (announced on 3 December 2005), and by the time it was announced, nine months of the first year had lapsed and the scheme has still not recovered from the cascading effects of this delay.

In terms of the *extent of funds released*, the programme seems to have dragged its feet. One may note that against the total Rs 4000 crore budget provision in 2005–7, GOI has released Rs 2595 crore which turns out to be 65 per cent of provision made and a mere 5 per cent of the total fund release to be made in seven years. This implies that in the remaining five years it will have to disburse 95 per cent of the funds.

Total budgetary provision for the current year 2007–8 is Rs 4127 crore which is likely to be used up (to give first instalment of assistance at the rate of 25 per cent of project cost) as adequate number of projects are in the pipeline and more will be coming from cities for approval. But even if GOI succeeds in releasing this entire amount or even up to Rs 5000 crore, cumulative performance by the end of third year will be 15 per cent against total project outlay of Rs 50,000 crore.

There is inadequacy of information regarding the receipt and expenditure of JNNURM funds. The data about actual receipt of JNNURM assistance and expenditure at ground zero level, that is, by ULBs and other city level implementing agencies, will be of real interest and a true indicator of progress of JNNURM. Unfortunately no consolidated data are available about actual JNNURM assistance received by ULBs from state governments or total expenditure carried out by ULBs and city level agencies.

There is disconcerting evidence to show that most cities lack the capacity to use/spend the funds disbursed to them under the JNNURM. GOI, as noted earlier, has released Rs 2600 crore at 25 per cent of its share of total project cost. This means that minimum project expenditure which theoretically should have taken place would be Rs 5200 crore, but informal feedback collected from the cities which were first to embark upon JNNURM and by far most advanced in implementation, indicate that at ground zero level hardly Rs 1500 crore were spent by all the ULBs taken together by end of the second year. If this

figure is compared against the Rs 100,000 crore investments planned to be achieved under JNNURM it comes out just a mere 1.5 per cent, which is very small.

The poor quality of CDPs, CIPs and FOPs prepared and submitted by ULBs barring some exceptions is a matter of a great concern.

COMPARISON OF APDRP AND JNNURM

It may be felt by some that the comparison between APDRP and JNNURM is not relevant, on various counts. First, APDRP mainly concentrated on improving efficiency, reliability, quality, and financial viability of electricity distribution while JNNURM aims at creation of urban infrastructure to improve supply of urban services in quantitative and qualitative terms. Second, JNNURM has just completed one and a half years while APDRP has completed its planned project period (2002–7).

But, notwithstanding dissimilarities, the following intrinsic similarities between the two schemes justify legitimate comparison. Both of them have a demand-based approach as against the usual supply-driven approach. Implementing agencies (SEBs or ULBs) are free to demand funds as per their requirement provided they meet norms and conditions. Both schemes are merit based, instead of pro-rata doles—funds will be provided to agencies based on their fund absorption and sustaining capacity. Both are performance based—funds will be released based on attainment of physical progress of capital work and meeting agreed performance benchmarks. They are focused on incentives—funds are provided to incentivize desirable performance by recipient agency. Schemes have provided a set of mandatory and optional reforms to be achieved by implementing agencies.

Analysis of performance under JNNURM clearly indicates that it is suffering from some of the weaknesses which affected APDRP:

- Budget allocation (at the rate of 50 per cent of annual target) and utilization of funds (1.5 per cent in two years period against total investment envisaged in seven years, and 5 to 7 per cent against annual target) are very poor and low.
- States have shown lack of interest. Though states are unwilling to undertake mandatory and optional reforms on their part and are negotiating hard with GOI, at present they have participated in JNNURM process, as they direly need JNNURM funds to address their urban problems.
- APDRP was uni-dimensional and more focused. In one sense it tried to provide funds to improve electricity distribution systems and tried to incentivize loss reduction efforts while JNNURM is attempting to

provide funds to improve availability and quality of various types of urban infrastructure services with special emphasis on providing basic services for urban poor. Infrastructure development of various kinds and diverse purposes warrant elaborate benchmark evaluation and performance monitoring.

- APDRP had two components—investment and reforms. But the investment component was not contingent on reductions in AT&C losses. Rather, it was available independently to improve distribution system of electricity which along with service delivery improvement resulted in reduction in cash loss and provided further incentive grants to SEBs. This is not the case with JNNURM. Investment grant is contingent on undertaking reforms and there is no incentive grant available for undertaking reforms except when cost of reforms can be covered under the scheme.
- In case of JNNURM, even though there is an urgent need to create adequate urban infrastructure, in reality it is the reforms implementation component which is most crucial. This is because most of the ULBs do not have financial, institutional, and administrative capability to create and sustain additional urban infrastructure even if they get full funding (free CAPEX) from an outside source. Given the criticality of reforming ULBs, JNNURM has quite appropriately, made release of funds for infrastructure investment contingent upon reform implementation, but that is the Catch 22 for JNNURM. Will GOI be able to hold further release of funds for infrastructure if ULBs and

states fail to honour reform commitments? Will it be able to stop costly urban infrastructure projects half way through? Such a stance could result in a situation where neither is the urban infrastructure augmented nor the ULB reformed. On the other hand, if GOI adopts a soft budgetary approach, then reforms will not take place but still funds will have to be released to salvage infrastructure projects undertaken. If the government decides to release funds for infrastructure to unreformed and unready ULBs, then it will have disastrous consequences because these institutions have starved for funds for ages and do not have capital absorption capacity. Unless massive capacity building efforts are undertaken simultaneously to improve their absorptive capacity, ULBs will squander the money.

Finally, the acute shortage of basic services in urban areas, particularly in those afflicted by urban poverty may not get redressed. Cities with capabilities of preparing long-term plan and ability to raise funds for infrastructure projects remain a distant dream. Even after redesigning power sector reforms for the third time, the reforms are vulnerable. The privatization of Delhi electricity distribution is not considered to be a success by the consuming public as privatization has only been associated with higher tariffs with no improvement in reliability of power supply (Lall and Rastogi, 2007). What the JNNURM can probably learn from APDRP is that having too many objectives complicates the reform programme and states lose interest sooner than later.

ANNEXE

TABLE A2.4.1
CDP and CIP Submitted by ULBs for UNNURM Assistance⁴⁶

Capital Investment Plans submitted under City Development Plan by ULBs for JNNURM Assistance										
S. No.	Local Body/Parastatal/WSS service provider	Total capex needs of the city	Total capex put for JNNURM grants	Capex planned by Municipal Body	WSS capex planned	GOI share at 35% or 50% or 80% or 90%	State govt's share at 10% 15% or 20%	Own share at 50% 30% or 10% of total capex	Proposed fund lever-aging through PPP	Proposed lever-aging through borrowing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
<i>Group A 1 Mega Cities</i>										
1	Delhi	24140	24140	24140	4387	9109	2961	12070	0	535
2	Greater Mumbai	55000	5776	5776	5776	2265	971	2540	0	3236
3	Chennai	34429	34429	34429	8620	12050	5164	17214	0	0
4	Kolkata	6939	5113	5113	4430	730	310	1158	920	1995
	Total A1	120508	69458	69458	23213	24154	9406	32982	920	5766
<i>Group A 2 (23 Cities)</i>										
<i>Gujarat-4 Cities</i>										
5	Ahmedabad	5111	4531	4531	654	1586	680	1880	0	2044
6	Rajkot	764	764	764	397	425	170	169	10	55
7	Surat	14957	7485	4968	646	2926	1171	1799	0	100
8	Vadodara	2392	2392	1897	553	948	380	569	0	0
	Sub total Gujarat	23224	15172	12160	2250	5885	2401	4417	10	2199
<i>Punjab-2 Cities</i>										
9	Amritsar	3150	1830	1086	312	461	184	277	907	0
10	Ludhiana	3995	2035	1941	523	1998	759	778	0	0
	Sub total Punjab	7145	3865	3027	835	2459	943	1055	907	0
11	Chandigarh	1286	252	252	162	346	0	25.20	0	0
<i>Tamil Nadu-2 Cities</i>										
12	Coimbatore	3186	1469	1469	77	735	294	441	0	368
13	Madurai	2361	2361	2361	312	1160	539	622	0	0
	Sub total TN	5547	3830	3830	389	1895	833	1063	0	368
<i>Maharashtra-6 Cities</i>										
14	Thane	4841	4841	4841	582	1071	505	1103	1641	798
15	Nagpur	5894	2273	1977	1105	1137	455	496	2850	185
16	Nanded	3640	1578	1578	447	693	56	749	714	80
17	Nashik	3940	3482	3482	644	1741	696	1045	0	0
18	Pimpri-Chinchwad	4416	3962	3962	524	1987	795	1546	0	79
19	Pune	6643	6072	6072	964	2428	971	2550	0	121
	Sub total Maharashtra	29374	22208	21912	4266	9057	3478	7489	5205	1263
<i>Karnataka-2 Cities</i>										
20	Bangalore	101646	22536	11355	2782	8003	2136	5680	0	0
21	Mysore	11356	1834	1834	529	1466	183	168	0	150
	Sub total Karnataka	113002	24370	13189	3311	9469	2319	5848	0	150
<i>Andhra Pradesh-3 Cities</i>										
22	Hyderabad	20017	20017	3515	2310	7692	2534	9791	1000	1121
23	Vijayawada	7300	4800	4800	540	2400	960	1440	0	0
24	Vizag (PPP for MRTS)	14987	8747	8747	3075	4469	2706	1571	4992	1663
	Sub total AP	42304	33564	17062	5925	14561	6200	12802	5992	2784

Annexe 2.4.1 contd.

⁴⁶ In the Annexe, data are presented as provided in CDP of a City.

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Annexe 2.4.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Kerala-2 Cities									
25	Trivandrum	7416	7416	7416	2123	5933	568	568	0	0
26	Cochin	10983	10983	10983	3845	5492	2197	3295	0	0
	Sub total Kerala	18399	18399	18399	5968	11425	2765	3863	0	0
	Haryana-1 City									
27	Faridabad	2679	991	991	435	474	188	278	0	50
	Sub total Haryana	2679	991	991	435	474	188	278	0	50
	Total A2	242960	122651	90822	23542	55571	19126	36840	12114	6815
	Group B (15 Cities)									
	Madhya Pradesh-4 Cities									
28	Jabalpur	1949	1949	1949	160	975	390	355	58	180
29	Bhopal	2153	1033	1033	550	516	207	310	0	0
30	Indore	2745	2745	1755	407	1369	549	827	0	314
31	Ujjain	759	759	759	93	607	76	53	0	2277
	Sub total MP	7606	6486	5496	1210	3467	1222	1545	58	2771
	UP-7 Cities									
32	Lucknow	11856	4845	4845	675	1742	705	1006	34	48
33	Agra	7855	7855	7855		3927	1715	2213	0	0
34	Allahabad	3309	3309	3309	684	1654	897	757	0	0
35	Kanpur	12791	12791	12791	4066	6395	2558	3837	0	0
36	Varanasi	3073	3073	3073	1246	1536	769	767	0	0
37	Meerut	1457	1457	1457		703	281	179	0	0
38	Mathura	1830	1830	1830	624	1462	151	91	0	0
	Sub total UP	42171	35160	35160	7294	17420	7077	8850	34	48
	Rajasthan-2 Cities									
39	Ajmer	704	704	704	156	563	70	70	0	0
40	Jaipur	4403	4403	4403	625	2201	880	1321	0	0
	Sub total Rajasthan	5107	5107	5107	781	2764	950	1391	0	0
	Orissa-2 Cities									
41	Puri	1828	1828	1828	450	1462	152.2	48	61	0
42	Bhubaneswar	2220	2220	2220	1032	2058	144	18	19	0
	Sub total Orissa	4048	4048	4048	1482	3520	296	66	80	0
	Total B	58932	50801	49811	10768	27171	9545	11852	172	2819
	Group C (10 Cities)									
	West Bengal-1 City									
43	Asansol	1529	1529	785	520	764	364	401	0	0
	Sub total WB	1529	1529	785	520	764	364	401	0	0
	Bihar-2 Cities									
44	Bodhgaya	434	434	434	54.3	347.7	43.46	43.46	0	0
45	Patna	3618	3618	3618	657	1530	562	891	610	0
	Sub total Bihar	4052	4052	4052	711	1878	606	935	610	0
	Jharkhand-3 Cities									
46	Dhanbad	3833	3833	3833	906	1916	767	1150	0	0
47	Ranchi	5598	5598	5598	781	2367.1	0	1014	0	0
48	Jamshedpur	3680	2679	2679	929	1340	536	804	800	0
	Sub total Jharkhand	13111	12110	12110	2617	5623	1302	2968	800	0
	Uttaranchal-3 Cities									
49	Dehradun	3885	3885	3885	1759	3108	389	389	0	0
50	Nainital									
51	Haridwar									
	Total Uttaranchal	3885	3885	3885	1759	3108	389	389	0	0

Annexe 2.4.1 contd.

Annexe 2.4.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
52	Raipur–Chhattisgarh	1213	1213	1213	507	606	243	364	0	364
	Total C	23789	22789	22045	6114	11979	2903	5056	1410	364
	<i>Group D (13 Cities)</i>									
	Jammu-Kashmir									
53	Jammu	5222	5222	5222	1428	4700	522.24	0	0	0
54	Srinagar									
	Sub total J&K	5222	5222	5222	1428	4700	522	0	0	0
	Other States 11 Cities									
55	Kohima–Nagaland	999	999	999	120	899	100	0	0	0
56	Agartala–Tripura	2072	1596	572	412	1436	160	0	0	0
57	Aizwal–Mizoram	5166	2012	2012	695	1811	201	0	0	0
58	Gangtok–Sikkim	2217	2217	2217	304	1995	0	222	0	0
59	Guwahati–Assam	3200	3200	3200	1383	2880	0	320	0	0
60	Imphal–Manipur	1873	1873	1873	609	1685	186	0	0	0
61	Itanagar–Arunachal	1690	1690	1690	222	1517	104	52	12	0
62	Shillong–Meghalaya	2544	2544	2544	530	2290	231	23	0	0
63	Shimla–Himachal Pradesh	3898	3898	3898	847	2143	525	29	1201	0
64	Panaji–Goa									
65	Pondicherry–Union Territory	1558	1558	1558	670	1021	136	119	0	0
	Sub total Other States	25218	21587	20563	5791	17677	1643	764	1213	0
	Total D	30440	26809	25785	7219	22377	2165	764	1213	0
	Total A2+B+C+D	356121	223050	188464	47642	117098	33740	54511	14909	9998
	Total A1+A2+B+C+D	476629	292508	257922	70855	141252	43146	87493	15829	15764

TABLE A2.4.2
Restructured Data of CDP and CIP Submitted by ULBs for JNNURM Assistance

Analysis of Capital Investment Plans submitted under City Development Plan by Cities for JNNURM assistance												
Name of City	Total capex put for JNNURM grant ⁴⁷	Capex planned by municipal body ⁴⁸	GOI share at 35% or 50% or 80% or 90%	State govt's share at 10% or 15% or 20%	ULB's share at 50% or 30% or 10% of total capex	Reve income for 2004–5	Reve expense for 2004–5	Revenue surplus ⁴⁹	Per capita revenue surplus (in Rs) ⁵⁰	Population ⁵¹ in lacs	Per capita capex proposed under JNNURM (in Rs)	Feasible investment ⁵² at 20 times of revenue surplus
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<i>Group A1 (4 Mega Cities)⁵³</i>												
Delhi	24140	24140	8449	3621	12070	2258	1950	308	241	127.91	18873	6160
Greater Mumbai	5776	5776	2265	971	2540	6050	4200	1850	1553	119.14	4146	37000
Chennai	34429	34429	12050	5164	17215	644.32	640.74	3.58	5.46	65.6	52483	71.6
Kolkata	5113	5113	1790	767	2557					132.06		0
Total A1	69458	69458	24554	10523	34381	8953	6791	2162		445	15609	43232
<i>Group A2 (23 Cities)</i>												
<i>Gujarat–4 Cities</i>												
Ahmedabad	4531	4531	1586	680	2266	806	596	210	597	45.19	10026	4200
Rajkot	764	764	425	170	169	130	95	35	362	10.02	7625	700
Surat	7485	4968	2484	994	1490	620	439	181	740	28.11	17673	3620
Vadodara	2392	1897	948	380	569	270	227	43	329	14.92	12714	860
Sub total Gujarat	15172	12160	5443	2223	4494	1826	1357	469	477	98.24	12378	9380
<i>Punjab–2 Cities</i>												
Amritsar	1830	1086	543	217	326	108	90	18	179	10.03	10828	360
Ludhiana	2035	1941	971	388	582	201	163.7	37.3	267	13.98	14716	746
Sub total Punjab	3865	3027	1514	605	908	309	254	55	229	24.01	12613	1106
Chandigarh	252	252	202	0	50	211	161	50	619	8.08	3119	1000
<i>Tamil Nadu–2 Cities</i>												
Coimbatore	1469	1469	735	294	441	109	94	15	103	14.61	10055	300
Madurai	2361	2361	1180	472	708	79.63	76.45	3.18	26	12.03	19626	63.6
Sub total TN	3830	3830	1915	766	1149	189	170	18	67	27	14185	364
<i>Maharashtra–6 Cities</i>												
Thane	4841	4841	1694	726	2420	384.7	291.5	93.2	732.2	12.6	8482	1864
Nagpur	2273	1977	1137	455	496	349	236	113	551	21.23	10707	2260
Nanded	1578	1578	1262	158	158	34	26.5	7.5	174	4.31	36613	150
Nashik	3482	3482	1741	696	1045	333	154	179	1662	11.52	30226	3580

Annexe 2.4.2 contd.

⁴⁷ Proposed investment figure is taken from respective CDPs/CIPs but each CDP has calculated it differently so this figure is to be taken as indicative and minimum.

⁴⁸ An effort is made to isolate investment proposed by municipal body of the city but in case of few cities it was not possible to ascertain that the figure represents investment proposed by a municipal body only. Again these figures are to be taken as indicative and represent minimal investment proposed.

⁴⁹ Though all efforts were made, data provided in CDPs are not robust and beyond suspicion. These figures should be taken as indicative.

⁵⁰ Many ULBs registered operative loss, so it was not possible to calculate per capita revenue surplus. Zero is taken instead of per capita revenue deficit figure.

⁵¹ Population figures differed in different set of documents. Here population figure for cities is taken as provided in JNNURM official Scheme Document.

⁵² It was assumed that a ULB will be able to undertake Capex at 20 times of its revenue surplus provided it receives JNNURM assistance @ of 50 per cent and registers revenue surplus every year with average 10 per cent annual growth in its revenue over the JNNURM period.

⁵³ Data for these cities are still incomplete, unreconciled, and involve multiple institutions. The sheer size and volume of these cities warrant separate treatment.

Pimpri-Chinchwad	3962	3962	1981	792	1189	461	218	243	2415	10.60	37377	4860
Pune	6072	6072	2428	971	2562	728	474	254	1000	27.00	22489	5080
Sub total Maharashtra	22208	21912	10244	3798	7870	2290	1400	890	1023	87	25186	17794
Karnataka-2 Cities												
Bangalore	22536	11355	3974	1703	5678	486	399	87	153	56.87	39627	1740
Mysore	1834	1834	1467	183	184	75	81	-6	0	7.86	23333	0
Sub total Karnataka	24370	13189	5441	1886	5862	561	480	81	153	65	20291	1740
AP-3 Cities												
Hyderabad	20017	3515	1230	527	1758	390	250	140	253	55.33	36177	2800
Vijayawada	4800	4800	2400	960	1440	155	82	73	722	10.11	47478	1460
Vizag	8747	8747	4374	1749	2624	168	81	87	655	13.29	65816	1740
Sub total AP	33564	17062	8004	3237	5822	713	413	300	380	79	21597	6000
Kerala-2 Cities												
Trivandrum	7416	7416	5933	742	742	64	33	31	348	8.9	83326	620
Cochin	10983	10983	5492	2197	3295	184	114	69.31	512	13.55	81055	1386
Sub total Kerala	18399	18399	11425	2939	4037	248	147	100	455	22	83632	2006
Faridabad-Haryana	991	991	496	198	297	82.0	50	32	303	10.55	9393	640
Total A2	122651	90822	44682	15653	30488	6428	4433	1995	474	421	21573	40030
Group B (15 Cities)												
MP-4 Cities												
Jabalpur	1949	1949	975	390	585	65	49	16	143	10.98	17269	320
Bhopal	1033	1033	516	207	310	104	91	13	90	14.58	7100	260
Indore	2745	1755	878	351	527	160	138	22	134	16.4	16748	440
Ujjain	759	759	607	76	76	33.42	39.11	-5.69	0	4.31	17610	0
Sub total MP	6486	5496	2975	1024	1497	362	317	45	97	46.27	11835	1020
UP-7 Cities												
Lucknow	4845	4845	2423	969	1454	107	90	17.0	75	22.46	21572	340
Agra	7855	7855	3928	1571	2357	52.05	41.69	10.36	46	13.31	34310	207
Allahabad	3309	3309	1655	662	993	41.64	24.44	17.20	176	10.42	24224	344
Kanpur	12791	12791	6396	2558	3837	152.12	129.32	22.8	89	27.15	50141	456
Varanasi	3073	3073	1536	770	767	38.91	43.75	-4.84	0	12.04	25552	0
Meerut	1457	1457	729	291	437	51.14	46.94	4.20	36	11.61	12110	84
Mathura	1830	1830	1464	183	183	11.43	11.87	-0.44	0	3.23	60937	0
Sub total UP	35160	35160	18130	7004	10027	454	388	66.28	72	100.2	34324	1431
Rajasthan-2 Cities												
Ajmer	704	704	563	70	70	23.41	22.32	1.09	2	5.04	13968	21.8
Jaipur	4403	4403	2201	881	1321	112.82	102.295	10.53	45	23.27	18921	210.5
Sub total Rajasthan	5107	5107	2764	951	1391	136	125	12	43	28	18239	232
Orissa-2 Cities												
Puri	1828	1828	1462	183	183	4.89	4.5	0.39	25	1.57	116433	7.8
Bhubaneswar	2220	2220	1776	222	222	30.0	25.7	4.3	65	6.58	15684	86
Sub total Orissa	4048	4048	3238	405	405	35	30	5	63	8	35750	94
Total B	50801	49811	27107	9384	13320	988	860	128	70	183	27219	2777
Group C (10 Cities)												
West Bengal-1 City												
Asansol	1529	785	393	157	236	11.7	10.8	0.9	0.1	10.67	7357	18
Sub total WB	1529	785	393	157	236	12	11	1	0	11	7357	18
Bihar-2 Cities												
Bodhgaya	434	434	348	43	43	0.478	0.476	0.002	0	3.94	11015	0
Patna	3618	3618	1809	724	1085	20.61	27.15	-6.54	0	13.66	26486	0
Sub-total Bihar	4052	4052	2157	767	1129	21	28	-7	0	18	22511	0
Jharkhand-3 Cities												
Dhanbad	3833	3833	1916	767	1150	1.65	2.23	-0.58	0	10.65	35991	0
Ranchi	5598	5598	4478	560	560	8.62	11.70	-3.08	0	8.64	64792	0
Jamshedpur	2679	2679	1340	536	803	0.66	1.02	-0.36	0	11.04	24266	0
Sub total Jharkhand	12110	12110	7734	1862	2513	11	15	-4	0	30	40367	0

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Annexe 2.4.2 contd.

Uttaranchal-3 Cities												
Dehradun	3885	3885	3108	389	388	13.5	11.4	2.1	47	4.48	86719	42
Nainital												
Haridwar												
Sub total Uttaranchal	3885	3885	3108	389	388	14	11	2	47	4.5	86719	42
Raipur-Chhattisgarh	1213	1213	970	122	121	72	129	-57	0	6.99	17353	0
Total C	22789	22045	14362	3297	4386	129	194	-65		70	31493	60
Group D (13 Cities)												
Jammu Kashmir												
Jammu	5222	5222	4700	522	0	27.37	19.12	8.25	135	6.12	85327	165
Srinagar												
Sub total J&K	5222	5222	4700	522	0	27	19	8	135	6	85327	165
Other States												
Kohima-Nagaland	999	999	899	100	0			0		0.77	129740	0
Agartala-Tripura	1596	572	515	57	0	5	8	-3	0	1.9	301053	0
Aizwal-Mizorum	2012	2012	1811	201	0				0	2.28	88246	0
Gangtok-Sikkim	2217	2217	1995	222	0					0.29	764483	0
Guwahati-Assam	3200	3200	2880	320	0	30.67	29.67	1	12.36	8.19	39072	20
Imphal-Manipur	1873	1873	1686	187	0	3.381	3.183	0.198	8.95	2.5	74920	3.96
Itanagar-Arunachal Pradesh	1690	1690	1521	117	52					0.35	482857	
Shillong-Meghalaya	2544	2544	2290	231	23	4.38	4.73	0.35	0	2.68	76768	0
Shimla-Himachal Pradesh	3898	3898	3118	390	390	19.53	20.27	-0.74	0	1.45	175448	0
Panaji-Goa												
Puducherry	1558	1558	1402	0	156	10.03	11.71	-1.68	0	5.05	104238	0
Sub total Other States	21587	20563	18116	1825	621	73	78	-4		25	97076	24
Total D	26809	25785	22816	2347	621	100	97	4		32	80578	189
Total A2+B+C+D	223050	188463	108968	30681	48815	7646	5583	2063	293	705	26732	43056
Total A1+A2+B+C+D	292508	257921	133521	41204	83196	16598	12374	4225	367	1150	22428	86288

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