For India to continue its growth on a sustainable path, investment in infrastructure is critical. Infrastructure bottlenecks are seen as one of the leading obstacles for India in realizing its economic growth potential. India’s information technology (IT) industry, which positioned India as a global player with competitive advantages, grew with access to good telecommunications infrastructure, sparked by a liberalized telecommunications market. But inadequate infrastructure—unreliable power supply, poor roads, and constrained airports—retards the ability of companies to scale up and limits foreign investment. According to Ahya and Sheth [2005], a three-fold increase to $100 billion (8% of GDP) by 2010 is needed for India to grow at a sustainable 8–9% rate; Prime Minister Manmohan Singh estimated that $320 billion was needed by 2012. Compared to China, which spent $150 billion in 2003 (10.6% of GDP), India spent $21 billion (3.5% of GDP) in the same period, one-seventh of China’s expenditure (see Ahya and Sheth [2005]).

The presence of infrastructure and foreign direct investment (FDI) are synergistically related. Foreign direct investment and other private capital flows are strongly influenced by a country’s investment climate. In China, manufacturing exports have been the foremost contributor to China’s economic growth and rapid development. In 2005, China attracted $72 billion in FDI, but India attracted one-tenth of this amount (see Exhibit 1). One of the reasons has been a government-imposed cap on FDI. Manufacturers have cited power shortages, taxes, and the “inspector raj” (bureaucracy), as key obstacles. Paradoxically, Stephen Roach of Morgan Stanley has stated, “India’s consumption-led approach to growth may be better balanced than the resource-mobilization model of China.”

India needs to attract private capital to finance a significant program of infrastructure development, required to grow domestically and position itself globally. Prime Minister Manmohan Singh has appealed to foreign investors for $150 billion in infrastructure investment over the next 10 years—$75 billion for power and electricity over the next five years; $55 billion for airports and railways over the next decade; and $25 billion for telecommunications over the next five years. Five mega-power projects of 4,000 megawatts were to be awarded by year-end 2006 as well (see Kochar and Kearney [2006]). India, with its infrastructure challenges, could benefit from a new approach that attracts needed financial resources through the invisible hand of the global capital markets.

The proposed global capital market approach, coupled with financial innovations, could help smooth the frictions that lie at the root of India’s infrastructure development problems. India holds great interest among capital-rich, developed-country financial markets seeking investment opportunities. Developing...
countries that are positioning themselves in the global economy also find India full of opportunities. Infrastructure spending in India is particularly politicized, and could gain efficiencies through the benefits of the global capital markets rather than at the hands of domestic politicians.

BACKGROUND

India, the largest democracy in the world, unleashed its chained economy more than two-and-a-half decades ago. Its first reforms began in the early 1980s, with pro-business domestic policies. India then reaped the rewards when pro-market liberalizing policies were set in motion. India transformed itself from an over-regulated, closed economy to a more attractive trading partner, proving savvy in providing talent and innovation in the global economy. Software exports and call centers were preceded by manufacturing gains from less burdensome regulation and policies that were in place a full decade prior to the market liberalizations of 1991.

The information technology industry contributed 5% to GDP in 2005, and is expected to contribute 17% to the growth of GDP between 2004 and 2010. While India has received acclaim in IT and business processing

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**EXHIBIT 1**

Foreign Direct Investment Inflows, 1995–2005: China and India (in millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td>37,521</td>
<td>2,151</td>
</tr>
<tr>
<td>1996</td>
<td>41,726</td>
<td>2,525</td>
</tr>
<tr>
<td>1997</td>
<td>45,257</td>
<td>3,619</td>
</tr>
<tr>
<td>1998</td>
<td>45,436</td>
<td>2,633</td>
</tr>
<tr>
<td>1999</td>
<td>40,319</td>
<td>2,163</td>
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<tr>
<td>2000</td>
<td>40,715</td>
<td>3,585</td>
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<tr>
<td>2001</td>
<td>46,878</td>
<td>5,472</td>
</tr>
<tr>
<td>2002</td>
<td>52,743</td>
<td>5,627</td>
</tr>
<tr>
<td>2003</td>
<td>53,505</td>
<td>4,585</td>
</tr>
<tr>
<td>2004</td>
<td>60,630</td>
<td>5,474</td>
</tr>
<tr>
<td>2005</td>
<td>72,406</td>
<td>6,598</td>
</tr>
</tbody>
</table>

Source: United Nations Centre for Trade and Development, Beyond 20/20 Database; http://stats.unctad.org/FDI/
exports, its infrastructure troubles are slowing the potential for economic growth, raising standards of living, and attracting private capital.

To bring another base of the economy up to speed, a cross-section of manufacturing capabilities are needed to offer greater employment opportunities for Indians. Importantly, a revival in manufacturing is occurring. India boasts numerous industrial jewels—Tata Group, Reliance Group, Bharat Forge, Infosys Technologies, Wipro Technologies, Bharti (a mobile telephony company), and world-class pharmaceutical companies. Agriculture offers a wide variety of opportunities as well. India’s developed financial markets offer a natural segue towards a global capital market approach. While labor is abundant, infrastructure constraints limit expansion, growth, and opportunity.

India’s regional disparities in terms of growth and specialization tell a tale of a two-speed, divergent country, with implications for infrastructure development as a key piece of the puzzle. At one extreme, the fast-growth states have skipped “directly to skill- and capital-intensive industries (within manufacturing) or to services where they appear to have a comparative advantage,” according to an International Monetary Fund working paper on India’s growth by Kochhar et al. [2006]. Under typical patterns of economic development, countries or areas tend to go through labor-intensive manufacturing cycles before they specialize. That is, leading regions like Delhi, Karnataka (Bangalore), and Maharashtra (Mumbai), all of which embraced the IT wave with their first-tier cities, have seen faster growth and rising incomes, alongside better infrastructure offerings (see Appendix I). These high-growth regions behave like industrial countries in their ways of diversification. Kochhar et al. [2006] also suggest that the economic convergence witnessed in post-war industrial countries, and East Asia, could repeat itself within Indian regions and states.

Kochhar et al. [2006] have identified Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh as slow-growth or lagging regions in India. These areas suffer from growing, less-educated, populations, and will likely follow more traditional economic growth and development patterns, moving toward labor-intensive manufacturing. These areas will also be a political force for redistributing resources, unless they are given incentives to reform governance, business climate, and infrastructure. Wilkinson [2006] argues that “high levels of electoral volatility (the proportion of seats that turns over in each state election) combine to cause highly inefficient patterns of state spending on infrastructure.” Politicians in electorally competitive states announce large numbers of infrastructure projects ahead of elections. Once elected, many projects promised by the newly elected are never completed or maintained, or, if constructed, are of very poor quality. Some states, particularly in lagging regions, have proved wasteful and corrupt in infrastructure spending.

What are India’s prospects in attracting more direct investment in infrastructure and economic development? Prime Minister Manmohan Singh has appealed to the private sector for a leading role in complementing public efforts in India’s infrastructure development. The partial antidote for both fast-growth states and lagging states is private investment in infrastructure. At the same time, the nature and characteristics of infrastructure projects are inherently risky. Large-scale projects require massive capital investment with long completion times, and many carry political and regulatory risk. In a study of large transport projects, numerous projects were poor performers with significant cost overruns and revenue shortfalls. While many other projects have been successfully completed, a number of spectacular failures have occurred which, in turn, sours the investment climate.

The following cases underscore some of the challenges faced in India, and will be addressed later with market-based solutions from the global capital market approach.

Case Studies of Infrastructure Projects

**Maharashtra State: Enron Dabhol Power Plant with Large-Scale Problems**

In April 1992, former Houston-based company Enron was invited by the Indian government to bid on the $2.9 billion Dabhol power plant project, 180 kilometers south of Mumbai. A memorandum of understanding was drawn up swiftly after a senior Indian delegation met with Enron officials May and June 1992. In 1993, the World Bank declined to finance the Enron project, calling it “unviable.” The Maharashtra State Electricity Board, the sole customer, was to pay Dabhol Power Co. (DPC) $220 million in usage fees whether or not it used that amount of power over the life of the 20-year contract. It fell into arrears due to unusually high power tariffs relative to other power projects in India. A high rate of return on capital investment was assured to DPC.

Bad contracts, politics, and economic circumstances ultimately doomed the initiative. The project’s costs were
never fully disclosed as required by Indian law, and there were no other bidders on the project. The contract was to be paid in dollars regardless of exchange rate changes, favorable or unfavorable; the rupee declined significantly over the course of the agreement. Construction halted on the final phase in 2001 and the plant closed. It had been producing electricity and was to be tied to liquefied natural gas supplies at the end of Phase II, which was four-fifths completed. The Dabhol power plant was to be the largest independent LNG power plant in the world. Allegations of corruption abound; contracts are under severe question in spite of cases being closed. The reincarnation of Dabhol, now called the Ratnagiri Power and Gas, Ltd., has yet to be realized, and the plant has not been restored to its full potential.

**Uttar Pradesh State: Corruption and Inefficiencies in Ambedkar Villages Program**

In the 1990s, the Ambedkar villages program was introduced to supply electrification, roads, irrigation, and other public goods to accelerate economic development in rural areas. According to the Indian government’s audit report, only 44% of the electrification targets were met during the time period between 1997 and 2001. Massive amounts of money simply disappeared; about $50 million or one-third of the total was “excess” expenditure, presumably directed toward kickbacks and corruption payoffs. In some cases, electricity was provided where there were no consumers. Many of the beneficiary villages were selected directly by the energy minister and the chief minister of the state of Uttar Pradesh, rather than on the needs-based criteria set for the program.

**Karnataka State: Political Risk in Mangalore Power Project**

An American firm, Cogentrix Energy Inc., was invited by the Indian government to join with Hong Kong’s China Light and Power Ltd. to partner in the much-needed 1,000 megawatt coal-fired project. In 1992, the two companies were to invest in, and develop, a $1.3 billion Mangalore power project. The project was designated as a “fast-track” project, which entitled it to federal financial guarantees. Mangalore Power Co. (MPC), the company set up by Cogentrix and China Light to develop the project, waited for over seven years to get clearance for executing the project. In 1995, China Light pulled out due to a dispute with the state. During those years, MPC spent more than $20 million and fought several public interest litigations for two years, eventually prevailing in the legal cases. However, there was a pending two-year-old suit alleging the payment of $13.8 million in bribes to Indian officials. After a lower court ordered an investigation into the allegations of corruption, MPC appealed to the Supreme Court in April 1998, and the Justices reserved the case for judgment in January 1999. MPC waited for almost a year without a verdict; as a result, Cogentrix quit the project on December 9, 1999, citing delays in approvals (red tape) and in public interest litigation. On December 13, 1999, four days after Cogentrix announced its withdrawal from the power project, the Supreme Court of India gave a judgment in favor of MPC.

The lessons of Dabhol and other infrastructure projects are many, and they need not be repeated. But unless new approaches are found that will ensure economic efficiency, transparency, better governance against corruption and bureaucracy measures, and proper enforceable contracts, many more billions of dollars may be wasted. With India ready to embark further in public-private partnerships for infrastructure projects, getting the formula right is imperative. This can make the difference between further regional divergences and politicization, which deters reforms and development, and the opportunity for more balanced growth for those who will need it most.

**SHORTCOMINGS OF EXISTING FINANCING APPROACHES**

Over the past two decades, the primary approaches of Build-Operate-Transfer (BOT) and Private-Public Partnerships (PPP) have been widely applied for hundreds of large-scale infrastructure projects worldwide. Of the $786 billion invested globally in PPP infrastructure projects between 1990 and 2004, India attracted only $33 billion—or 4%. These two existing approaches reveal detrimental flaws and have led to substantial amounts of wasted resources. Infrastructure projects with private participation that were cancelled or distressed amounted to $79 billion between 1990 and 2004, with larger projects more prone to distress or cancellation. In India, cancelled or distressed private participation projects comprised 7% of the $51.4 billion spent on projects in the World Bank's database.

Under the existing approaches of BOT and PPP, infrastructure project financing is structured in a way that creates the problem of “plums”, in contrast to the illustrious “lemons” problem by Akerlof [1970]. The plums problem, coined by Chen [2006], arises when the buyer (bidder or firm providing capital) knows more about the
quality and economic value of the project than the seller (government agency); while in the case of the lemons problem, buyers are disadvantaged because they have less information than the sellers about a project’s value, risks, and costs. Under the existing approaches of BOT and PPP, a small number of project companies that provide capital often have better knowledge than the various government parties about the project’s costs and value. Project companies have incentives to play political games, which gives rise to corruption and waste. Consequently, project sponsors and investors may then be deterred from future projects in the host country or even in the region, as happened in India post-Enron.

When initiating an infrastructure project, a project company is formed under the BOT and PPP approaches. The project company constructs and operates the project for 25 to 35 years before transferring it back to the government. Under the PPP model, the government buys services from the project company. Even the State-Build-Own-Operate (SBOO) approach has led many countries down the path of privatization—Mexico, the UK, China, Nigeria, and many more. The private sector’s ability to attain efficiency in operations, management, and profitability, has been needed for numerous financial and economic reasons in the privatizing country.

There are several major shortcomings of the BOT and PPP approaches, creating severe agency costs and failures for large-scale projects. A few major ones are discussed below.

First, the bidding process is inefficient. The influence of domestic politicians, and possible bribery and corruption, may weigh heavily in the bidding process. In India, corruption in infrastructure projects often has political roots (see Wilkinson [2006]). The National Highway Authority of India (NHAI) has a history of sabotaging the competitive bidding process by politics and special interests. To secure projects, major construction companies fund entire projects, instead of letting them be funded partly by the government, and they are also willing to partially fund the NHAI through negative grants. For two BOT concession agreements for roadways in Gujarat at a total cost of Rs. 7,100 crore—the NHAI will receive a negative grant of Rs. 450 crore each from the two concessionaires. The lack of competitive bidding in the Enron case set the project on an unstable foundation from the onset.

Inefficiencies in contract finance show up in negotiations and bidding processes that require vast amounts of time and effort for completion. The Mangalore Power Company set up by Cogentrix and China Light and Power was held up seven years before it received clearance for project execution. Direct investment by firms is subject to the bureaucratic red tape and political risk of host countries’ politicians. India has a reputation for bureaucratic red tape; this is particularly true in more economically-lagging regions which tend to have more entrenched local political and business interests. There are better ways to conduct large-scale infrastructure projects in the future. Onerous red tape and overly political project approval processes will create obstructions for India in attracting foreign firms and capital for infrastructure projects.

While governments have tried to increase efficiency and lower project costs through “limited” public tenders, other problems have surfaced. Specifically, the bidding process suffers the plums problem, wherein a small number of sponsoring companies with sufficient equity capital and know-how of infrastructure projects can offer and receive low bids for projects. The many cases of cost overruns observed around the world are likely the result of low bids by sponsors to secure projects. Indonesia and the Philippines incurred some $10 billion and $6 billion in bad debt, respectively, from BOT investments. The World Bank pointed to bad negotiations in BOT investment projects as the source of billions of dollars lost during the Southeast Asian financial crisis.

The Enron-Dabhol project serves as an example of plums problems par excellence—a lack of competitive bidding, unfair contracts, and limited knowledge by the seller (the government) in terms of project scale, technologies, and complexity. Unfair competition for contracts will not yield the longer-term goals of sustainable growth and development and better governance records. The Indian government should re-think the BOT roadways projects in the light of how infrastructure’s role interacts with other areas such as bureaucracy, corruption, and macroeconomic stability—all of which impact the decision of private firms to invest. These areas beg the question of how to reconcile existing infrastructure financing approaches with a country’s desire for better governance and a more attractive business climate for private investment.

Second, these approaches are subject to unenforceable project contracts that can be nullified, posing significant political risks to private firms. Such policy risk—the risk that a government will discriminatorily change the law, regulations, or contracts governing an investment—is a problem for investors, consumers, in both developed
and developing countries (Henisz [2006]). In India, water and power projects from Orissa to Thiruvananthapuram, Kerala, are meeting with public contention. Problems range from high tariffs without increased quality, poor service, and a lack of transparent public information about processes and goals. These reversals are not unique to India, however. In 2000, Turkey adopted the BOT approach in its electricity sector and, three years later, a new Turkish government moved to cancel 30 BOT projects. The Enron project suffered from contractual reversals when a more left-leaning government came into power.

Post-contract opportunism can cut both ways, however. Project companies can engage in managerial misdeeds and self-serving behaviors (agency costs) before they turn the project back to a government. Over the life of a contract, managers may have an incentive to transfer resources to themselves before the handover occurs. With many existing large-scale BOT and PPP infrastructure projects launched less than two decades ago, it is too early to assess any managerial incentive problems. While the Dabhol power plant was left unfinished, the ingredients of self-serving behaviors played a significant role in placing the affected population literally and figuratively “in the dark.”

Third, the two approaches suffer from a lack of diversification and liquidity in the project’s finances. Project sponsors with concentrated equity bear almost all the risks—both financial and political—and also lack diversification in these risks. The number of participants in project finance is usually small, giving rise to illiquidity and concentration risk. The number of leading banks in a syndicated project-lending consortium is also usually quite small. Thus, sharing in project risk for equity holders and creditors is limited.

Given the severe shortcomings of the infrastructure project finance approaches of BOT and PPP, the time has come for a new approach that utilizes the best of the private sector alongside its financial innovation. Given the vast infrastructure needs in India, a progressive approach is needed that levels the playing field, deters political and policy risk, and develops more efficient, transparent market mechanisms. If there is to be real progress toward development goals and reduced poverty, this evolution is vital. The forces are converging in India with reform-minded politicians and a growing, educated middle class desiring that the Indian economy be unshackled from its past.

**INNOVATIVE APPROACHES TO FINANCING INFRASTRUCTURE**

Infrastructure development is a way forward to attract the capital needed for developing economies to grow. It is too vital to be left in the hands of politicians and to the devices of current “contract finance” approaches. The experiences with privatizations and securitizations suggest that the “market finance” approach, which creates immediate private ownership of public investment projects among diverse groups of investors, may lead to more efficient and successful infrastructure development.

The financing of projects should be guided by the invisible hand of the global capital markets to determine the economic value of an infrastructure project and provide the necessary resources for construction, operations, and maintenance. Project securitizations (PS) or initial public offerings (IPOs) of project securities can be designed with financial innovations for any new large-scale infrastructure project. This would create diversification and liquidity, and eliminate the plums problems that accompany the existing BOT and PPP approaches in financing infrastructure projects. It would also begin to unravel the perverse incentives pervading infrastructure spending in India. This approach can also be applied to privatizations and securitizations for existing infrastructure assets undergoing modifications.

The tools available in today’s global economy allow developing countries to benefit, as have the advanced economies, from raising capital and promoting projects. This approach would bring true private-sector participation for economic development and legitimize further business activity. It would ensure ample funding, strong interest, and awareness of projects on a global scale. India’s domestic capital markets could participate as well, thus ensuring greater community interest and avoiding the “mood swings” of local public opinion. The market’s oversight would foster efficiency and liquidity for future claims on the project’s cash flow. Managerial incentives would be more aligned with productivity, thus reducing the widespread problems of cost overruns and inefficiency. Governments—central, state, and local—could be allocated project securities to achieve true public-private ownership.

The process of infrastructure project globalization begins with a sufficient number of project securities, such as project stocks and bonds, being issued to establish reasonable unit prices, and encourage broad foreign and
domestic participation. Making large PS or IPO issues in different equity and bond markets around the world would increase liquidity for project securities. Transparent economic information on an infrastructure project, and due diligence analysis of the project’s future cash flows, would establish the market values of project securities with varying claims on future cash flows.

Well-capitalized project companies would show great interest in investment opportunities brought by new project securities. There has been mounting evidence in the news media, over the past year, that infrastructure investing is generating greater interest and attracting large sums of capital. This applies to both new infrastructure projects and existing infrastructure assets requiring upgrades, new management, or aid to cash-strapped governments at local, state and national levels. Greater participation in PS or IPOs would result in fair market values of project securities. Other investors worldwide might naturally be concerned about having adequate knowledge or information associated with investing in project securities of specific infrastructure projects. They might demonstrate less interest in investing in project securities due to the lemons problem discussed earlier. Therefore, unlike traditional stock and bond offerings, new innovations in security design would be utilized to reduce investment risk and allow for unanticipated gains. Conceptually, this is similar to the familiar protection of “lemon laws” or the warranty on a pre-owned car.

The lack of information or the lemons problem faced by investors can be redressed by using available financial innovations. One such innovation involves issuing a puttable stock, a common stock that can be “put” back to the issuer. It is essentially a money-back guarantee that mitigates downside risk. This would also resolve the problem of underpricing the IPO and providing incomplete information to investors. Advances in pricing infrastructure assets and IPOs are already being made by financial market players experienced in infrastructure funds.

Conversely, investors can participate in upside potential by way of security design innovations. For example, combining project stock with contingent value rights (CVRs) would attract investors seeking to reap rewards on the upside. CVRs permit investors to reap the benefits of upside appreciation, while maintaining downside protection. Risk-averse foreign investors in an environment of information asymmetries might find this more attractive than simply puttable stocks. Additionally, offering redeemable and convertible project preferred stocks would attract certain types of preferred stock investors in domestic and global capital markets.

In addition to project stocks, a large number of project bonds and preferred stocks should be issued through IPOs. Project bonds should include tax-free status to attract private domestic and foreign bond investors. Like corporate bonds, project bonds should contain event-risk provisions or covenants for unforeseen adversities such as tsunamis, earthquakes, terrorist attacks, exchange rate volatility, oil price shocks, or other risks specific to a particular country environment. Project bonds with bearish event-risk provisions can be viewed as puttable bonds that protect bondholders from losses if certain designated events occur; some of the fallout from a decline in the project’s value or a steep downgrade in the rating of project bonds can be attenuated in this manner. Alternatively, bonds may be issued with bullish event-risk provisions. A bullish event that increases the economic value of an infrastructure project could trigger conversion of bonds into project stock shares.

The variety of ways in which securities are designed can attract different classes of investors at the initial stage of a PS and an IPO, as well as in subsequent secondary markets. Projects having the characteristics of a natural monopoly may set up a public service commission to determine the prices of services that allow a fair return for stockholders. To improve incentives and productivity, construction workers and project operation employees could be granted stock options. Wilkinson [2006, p. 28] finds that inefficiencies in public-sector units in India have led to massive annual losses—about 1.4% of GDP. Power sector losses and subsidies total 1.3% of GDP with unpaid electricity liabilities a further 1.1% of GDP.

Financial innovations in an IPO can serve as both deterrent and incentive. For example, including event-risk provisions in project bonds can deter politicians’ attempts to make undesirable policy changes. This can ultimately foster a more investment-friendly environment, which India greatly needs. Domestic and foreign bond investors will find the package of bonds and put/call options attractive. Managers and stockholders would be less likely to make decisions that enhance equity value at the expense of bondholders. Sound decisions and proper management will bring its own reward through enhanced project value, and the value it brings to the community and economy at large, which must be communicated to stakeholders. In the end, the explicit costs of debt financing for infrastructure would be lower. Of great consequence,
COMPLEMENTING ECONOMIC ADVANCES IN INDIA: A NEW APPROACH TO FINANCING INFRASTRUCTURE PROJECTS

The invisible hand may prove more capable in setting infrastructure project agendas that span varied administrations and political agendas.

Newly developed financial instruments can be used to enable infrastructure financing in a way that reduces agency costs arising from bureaucratic regulations, information gaps, and improper incentives. Globalizing the infrastructure project's finances can help create an environment that will enable further private-sector development, and reduce the costs of doing business. Since independence, the evolving political landscape has hamstrung India's economic potential, which can now be redressed through the financial discipline of more transparent capital markets.

FUTURE DIRECTIONS AND CONCLUSION

This approach to financing infrastructure is a way forward to realize economic and development goals. If infrastructure can be financed through global capital markets, the foundation will be laid for incremental business activity and greater access to the global economy. The appearance of many diverse stakeholders—foreign investors, governments, and domestic investors and consumers—can further catalyze the reforms needed to infuse additional private sector activity. Prior methods of infrastructure project finance have worked, but at costs hidden to society.

Private-sector financial innovation and methods can be utilized to contribute needed financial resources and expertise. Infrastructure funds have been developed by a number of international investment banks. One Australian investment bank's infrastructure fund owns stakes in a major Chinese port, a Japanese turnpike, a major English toll road, plus other U.S. and European infrastructure assets. Thus, the private sector is developing an enhanced capability in managing infrastructure assets and operations on behalf of governments that are privatizing or leasing public infrastructure (see Appendix II on the state of private market developments). This knowledge is transferrable and complementary to the global capital market approach for new large-scale infrastructure projects; it can also be applied to groups or consortia of new smaller-scale projects related by sector or geography.

India's capital markets have demonstrated that strength and resilience—even weathering terrorist incidents—that other more developed markets have displayed during similar upheavals. Recently, large multinationals have been staking positions in India's financial sector; one investment bank intends to invest $1 billion in infrastructure and real estate in India. The largest Indian IPO was completed in May 2006 to fund the largest oil refinery complex in the world; $600 million was raised for the energy conglomerate Reliance in the Special Economic Zone in Jamnagar in the state of Gujarat. In the summer of 2006, Finance Minister P. Chidambaram announced the appointment of a high-powered expert committee to lead Mumbai, already India’s financial center, into the role of a regional (and perhaps international) financial center. Developed financial markets are a prerequisite for the global capital market approach to function optimally.

The financial community must further gear itself to handle this type of arrangement by creating the financial architecture and processes to service projects’ financing needs. This approach can bring new choices in social investment to individual and institutional investors. Greater access to the global capital markets can further expand the mix and amount of resources available for development in India.

In addition to the physical infrastructure needed, India presents a solid foundation in “soft” infrastructure. A reliable banking system, functional capital markets, a well-developed legal system, and respected higher educational institutions, all underpin India's political and economic life. India's foundation in soft infrastructure assets will create an attractive business environment, once physical infrastructure catches up and political and policy obstacles are reduced. According to Wilkinson [2006], policy elites—“bankers and industrialists, academics, senior members of the Planning Commission, and even leaders of many of the national parties—believe that the current system's large budget deficits and inefficiencies are simply unsustainable and that fiscal crisis will eventually lead to some change in the present clientelist system.” The Bharat Nirman program to support rural infrastructure and development will utilize $3 billion of World Bank loans, hopefully with efficiencies in mind.

New incentives to attract capital and projects may emerge for economic and financial policymakers. Equally important in laying the groundwork for politically sensitive, important, or large-scale infrastructure projects is thorough communication among community stakeholders, project companies, and financial architects. A more positive outcome is possible under this global capital market approach in jump-starting projects, allowing the project’s introduction to stand on a more solid and transparent foundation from proper due diligence and
communication to civil society. Public affairs efforts must play a role in sufficiently communicating the benefits of a project to those who might be tempted to overturn it for political reasons. The benefits of partnership among all stakeholders of a community’s assets may help stabilize the polarization of lagging regions. A lack of proper communication among the most-affected constituents in new infrastructure projects has led to many cancelled projects, particularly in India.

Indian government officials and policymakers can create conditions for projects to “go to market” with accompanying good information that would attract this type of project investment. The market will impound information about value and risk and is already doing so through the development of infrastructure funds. A more virtuous cycle of growth will be enabled by exposing infrastructure projects in India to a global capital market approach. However, overly populist government agendas can undo the great strides forward made by India, with its growing legion of globally-minded firms. While momentum is on the side of entrepreneurialism, India’s progressive reformers must keep steadfast.

What would be the result for India regarding Dabhol, the largest LNG power plant, if the contracts were structured differently, stakeholders brought on board, and the project financed by global capital markets? The balance may tip in favor of India with its strong fabric of institutions that can support greater private-sector activity, both in infrastructure development and the incremental economic activity it creates. With India’s human and intellectual resources, surely this timely approach to infrastructure project finance can complement the significant advances already made.

### Appendix I

The following chart illustrates leading or lagging states in India (based on Table 11, *The State of India’s States*, in Kochhar et al. [2006; p. 39]).

<table>
<thead>
<tr>
<th>States</th>
<th>Investment Climate</th>
<th>Infrastructure Penetration</th>
<th>Financial Sector Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leading States</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Delhi</td>
<td>3.1</td>
<td>3.7</td>
<td>3.9</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>3.1</td>
<td>2.6</td>
<td>2.4</td>
</tr>
<tr>
<td>Kerala</td>
<td>2.8</td>
<td>2.5</td>
<td>2.1</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>2.3</td>
<td>2.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Gujarat</td>
<td>2.4</td>
<td>2.3</td>
<td>2.2</td>
</tr>
<tr>
<td>Punjab</td>
<td>2.9</td>
<td>2.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Karnataka</td>
<td>2.7</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Group Average</strong></td>
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<td>1.6</td>
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### Appendix II

Case Study: State of Global Capital Markets and Infrastructure

Note: The following information presents a snapshot of the activity in the capital markets as related to infrastructure.

Over the last several years, the infrastructure industry appears to be one of the fastest growing asset classes. Current market value is calculated at over $1,600 billion. The Macquarie Bank Group of Australia is a leader in creating infrastructure funds including an infrastructure index (Macquarie Global Infrastructure Index or MGII), which has seen a 200% increase in market capitalization from July, 2000, to the end of January, 2006. The MGII 100
Index comprises the top infrastructure stocks of developed-country companies (listed) and captures the growth of the market; its total return has been 9.9% per annum since 2000, according to a Macquarie press release (September 2006). An unlisted version exists as well. The global universe of listed infrastructure issuers numbers more than 350. Macquarie is capitalizing on the worldwide growth in both infrastructure (particularly arising from public private partnerships and privatizations of government assets) and utilities—electric, gas, and water.

Trends in decreasing public investment in public works projects and the increased role of the private investment are combining to create an asset class that investment managers are keen to explore. The chief investment officer of the largest U.S. public pension fund, the California Public Employees’ Retirement System (Calpers), is considering investing in infrastructure and emerging markets; it specifically named China as a country of interest.

A new closed-end fund, the Macquarie Global Infrastructure Total Return (NYSE: MGU), priced an IPO on August 29, 2005. The fund issued 17 million shares at an initial price of $25, for gross proceeds of $425 million. As of December 6, 2006, an annualized distribution rate of 5.85% (market pricing) has been achieved, alongside a recent quarterly dividend of $0.40 per share. Other investment firms are following suit in the creation of infrastructure funds, which also includes a managed fund geared toward retail investors by Macquarie. In Europe, listed infrastructure has provided a 14.3% return to investors, and unlisted infrastructure 12.5% (mature, as opposed to development stage infrastructure) (see Kilbinger [2006]).

ENDNOTES

The authors would like to thank Mark Chen and Amar Gande for their helpful comments.


2Foreign Affairs, September/October 2006.

3“Virtual Champions.” The Economist, June 1, 2006.

4Flyvbjerg et al. [2003] found that cost overruns of 50–100% and revenue shortfalls of 20–70% were not uncommon.


9The Hindu, June 4, 2006.


12Pope [2004] cites another example of the $3.6 billion financing of the Baku-Tbilisi-Ceyhan pipeline project, signed in February 2004, that took 10 years to negotiate; it required 208 finance documents and 17,000 signatures from 78 parties.

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