Global Economics
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India:
Everything to Play for

With the right reforms, India could grow at 10% for a decade

John Llewellyn, Robert Subbaraman, Alastair Newton and Sonal Varma

LEHMAN BROTHERS

FOREWORD

Lehman Brothers has had a long association with India – both through its own presence in the country, and through the many Indian nationals who work for us, including the 2000 staff we have in our knowledge center in Powai. But, as India's impressive economic expansion gained momentum, the question naturally arose whether our presence in India was of sufficient scale, or whether we should raise it by a quantum leap.

Such a decision is never to be taken lightly; and certainly we did not. First and foremost, we had to decide whether India's recent growth upsurge was likely to prove temporary, as some commentators at the time were suggesting, or whether it had a chance of becoming self-sustaining.

Accordingly, we embarked on a detailed and lengthy evaluation of the prospects for India's economy, Indian financial markets, and Indian governance. We were encouraged by what we found. India's rapid growth of the past several years, we concluded, bears all the hallmarks of the sort of economic take-off that, in earlier decades, had taken place elsewhere in Asia, and stunned a world that until then had thought that single-digit growth was the most that any economy could achieve.

In short, we concluded that India's growth could not, and should not, be dismissed as a flash in the pan. But our research also led us to conclude that a continuation of recent fast growth is not automatically guaranteed: just as this growth is the result of important structural policy reform, so will future growth be shaped, in respect both of its rate and its quality.

In this respect, India is no different from, and cannot escape the challenges faced by, other successful economies, whether developed or developing: in a world of rapid technological change, changing tastes, global competition, climate change, and myriad other challenges, economies need continually to adapt. And the structure of countries' governance has to lead this, if economies are to realise their full potential.

India has learned a great deal from its structural policy reforms of the past decade; and we suspect strongly – though it is not guaranteed – that these lessons will be carried forward, and built upon, in the coming years. And it is on that basis that we judge that India's economy has the potential to grow at 10% or so annually over the coming decade. Consistent with being one of the world's fastest growing economies, India is likely to attract substantial foreign investment, and its local capital markets have enormous growth potential.

Hence it is fitting that we are releasing this report, which contains a good part of our thinking as we approach the first anniversary of the opening of our new office in Mumbai, Ceejay House. In this short period of time, we have already created a full scale investment banking, securities trading and private equity business, a clear vote of confidence in the economic and social future of India – a future in which we at Lehman Brothers fully intend to play a large and growing part.

Tarun Jotwani

Chairman and CEO of Lehman Brothers, India

ACKNOWLEDGEMENTS

This study owes to many people.

It all started with the head of global research at Lehman Brothers, Ravi Mattu, saying "I think that something pretty interesting is going on in India. But why don't you go there and look for yourself. Talk to people, make up your own mind, and write what you conclude." So we did: one could not ask for a fairer mandate, nor a more interesting one.

That was getting on for two years ago. In the intervening period, many people have helped. Senior members of the Government of India, of the Reserve Bank of India, and of the regulatory authorities all made themselves readily available and spoke with impressive openness. The Confederation of Indian Industry arranged for us to meet a host of representatives of different industries and other experts, who likewise invariably spoke with candour.

Sir Michael Arthur, the then British High Commissioner and himself no mean scholar of India, together with his staff, generously arranged for us to talk usefully with a wider cross section of Indian society than we could ever have managed by ourselves; and UK Trade and Investment set up instructive meetings for us not only in Delhi and Mumbai but indeed throughout India.

We are also indebted to many Indian economists for their frank discussions and debates, including Priya Basu (World Bank), Subir Gokarn (CRISIL), Pulin Nayak (Delhi School of Economics), Ila Patnaik and Ajay Shah (National Institute for Public Finance and Policy), Ajit Ranade (Aditya Birla Group) and Shubhada Rao (Yes Bank). Dr Vikram Akula, CEO of SKS Microfinance, was kind enough to talk us through the world of microfinance. And we are grateful for illuminating discussions with Peter Wonacott (*Asian Wall Street Journal*), and Jo Johnson and Amy Yee (*Financial Times*).

The global world being what it is, we also received advice, encouragement, and information from outside India's borders, particularly from The Indian High Commission in London, and staff at Chatham House and the International Institute for Strategic Studies. And we had two particularly useful discussions with Richard Herd of the Organisation for Economic Cooperation and Development

Sanjeev Kaushik and Chimon Fernandes of the Lehman Brothers' Mumbai office arranged many meetings with interesting organisations, and helped with an array of logistical issues. Julia Giese did a significant amount of the early research work before she left the Lehman Brothers London office to start on her DPhil at Oxford.

Authors of particular parts are in general acknowledged in their respective sections: but specific mention should be made of Camille Chaix for her contribution on climate change, and Evdokia Karra and Melissa Kidd for their contributions on carbon trading and the clean development mechanism.

Lehman Brothers' Global Chief Economist, Paul Sheard, encouraged us throughout and, near the end, read the study through in its near entirety. And Valerie Monchi and her team looked after the full range of technical issues, from editing to layout to production.

We have sought to document everything that we say in the report, to the greatest extent possible; and we have endeavoured to make judgements explicit, so that the reader can decide. But, as always, there are the inevitable errors. The responsibility here rests with us, and us alone.

The cut off date for information in this report is 5 October 2007.ℐ

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BOXES AND APPENDICES

EXECUTIVE SUMMARY

- Impressive though its economic transition has been, we judge that India could grow sustainably even faster than at present, and faster than most other studies have suggested, i.e. at 10% or so per annum over the coming decade. This judgement is contingent on India continuing to actively pursue structural economic reforms.
- Naturally, a sharp global economic downturn is a risk to India's near-term economic growth. While India is one of the least vulnerable economies, it is not immune. Conversely, a period of demand running ahead of supply cannot be ruled out, raising risks of short-term overheating.
- But more important than the ups and downs of the economic cycle are the structural changes behind India's growth acceleration, contributing to capital deepening and rising productivity. They include the development of the financial system, trade and capital account liberalisation, and more prudent macro management.
- Conventional static "growth accounting" analysis gauges the contributions of labour, capital and multi-factor productivity to GDP growth. We believe that this approach fails to take adequate account of dynamic interactions in an economy, especially a developing one which has reached "take-off". That is the basic reason why our estimate of India's potential rate of growth is higher than that of other studies.
- We find clear evidence that India's rapid economic development, high growth and reforms have started to interact positively with each other – the economy appears to be taking on many of the characteristics exhibited by other large Asian economies during the early stages of economic take-off.
- While business continues to prove impressively adept at working round systemic and structural challenges, sustaining higher growth in the medium term will require continuing structural reform. For example, we estimate that further financial sector reforms could add 1 to 1½ percentage points to India's long-term GDP growth.
- Even larger economic gains could flow from removing constraints such as weak (soft and hard) infrastructure, bureaucracy, and labour market rigidities. Breaking down these barriers is key to enabling business to achieve increasing returns to scale by capitalising on its global comparative advantages in labour-intensive manufactured and agricultural exports. We estimate that India's trade-to-GDP ratio could double over the coming decade, also adding 1½ points to GDP growth.
- However, pushing through structural reform will remain a political challenge in the face of headwinds from vested interest and coalition politics. That said, there should be a new window for reform after the next general election due in 2009.
- Given the powerful trends of demography and urbanisation, India needs "a faster and a more inclusive" growth strategy to correct its inter- and intra-regional imbalances and avoid social unrest. The social and economic costs of not pursuing inclusive growth are potentially enormous.
- Inclusive growth can be facilitated by further easing the shackles on business, by making education and health available to all of society and by developing the rural sector, which employs nearly 60% of the total workforce. Labour market reforms to spur the necessary job creation over the next decade will be a key challenge.
- India's growing economic clout is encouraging a more proactive regional policy and greater engagement on the global stage, for example in trade liberalisation and the climate change debate, which also stand to boost economic growth.
- In short, given that there is still much growth potential to be unlocked, India has "everything to play for".

CHAPTER 1: INTRODUCTION

John Llewellyn
44-20-710-22272
jllewell@lehman.com

Rob Subbaraman
85-2-2252-6249
rsuba@lehman.com

Alastair Newton
44-20-710-23940
anewton@lehman.com

Sonal Varma
91-22-4037-4087
sonal.varma@lehman.com

With attention focused principally on China, for the first half of this decade India's progressive upturn in economic growth went largely unremarked. This was especially so following China's accession to the World Trade Organisation (WTO) in December 2001, with all its attendant potential implications for the global economy.

Recently, however, India has been attracting the attention its economic performance merits. In turn, this growth performance has raised questions about the future. Opinion has been spread over a wide spectrum.

At one end are commentators who argue that India's recent growth performance will prove unsustainable, that "overheating" threatens its sustainability. And, certainly, India has never grown so rapidly as it has in the past few years.

At the other end of the spectrum, we ourselves consider that history – or at least India's history – need not prove to be a perfect guide. Our judgement, based on a dynamic analysis of the growth process and examination of the performance of other Asian "miracle" economies, is that India could grow even faster over the coming decade than it has to date – at 10% or so over the coming decade. But that would depend upon India's continuing to make progress with structural economic reforms.

As is only to be expected with a culture and economy as richly diverse as India's, coming to a firm and convincing forecast of the economy's growth prospects for the next decade or so is far from straightforward. That is why, in preparing this report, we have undertaken an in-depth, holistic examination of the drivers behind the surge in India's rate of GDP growth over the past two decades or so – particularly since the start of the 21st century – as well as the factors which will determine whether that can be sustained or even improved upon. In particular:

- We have used the growth accounting framework and statistical techniques which extract the trend component from growth. However, while these methods are useful to quantify *what* has happened to an economy, they do not explain *why* it happened. So, on their own, they are not very useful at forecasting the future.
- We have therefore coupled growth accounting with an examination of the policies and reforms which have driven India's growth acceleration hitherto, before assessing whether the current momentum is likely to be maintained if not increased.

Our starting point has been the premise that the question of how fast the Indian economy may be able to grow sustainably over a multi-year period can be addressed only on the basis of presumptions about influences which may prove important in the future.

Some inferences may be obtained from influences judged to have been important in India's past or in growth accelerations in other countries. However, even if these have been identified correctly – and perhaps even quantified – the rate at which they will carry forward will depend on many factors, especially structural reforms, which will, in turn, be influenced by India's politics.

It is therefore useful to approach the matter from two directions: by considering the factors which have enabled India's economic growth to accelerate; and by examining how this evidence compares and contrasts with influences which have been important in other economies, particularly in Asia.

The first question is important because, in the words of Professor Bakul Dholakia in his Presidential address in 2001 to the Gujarat Economic Association:

> "In a developing country like India where rapid economic growth has become a national goal, analysis of the sources of growth assumes special significance not only because it helps to find out what has and what has not been important in the growth which has already occurred, but also because of the obvious

> implications it has for the macroeconomic strategy and policies that affect the future growth – its rate as well as pattern." [1]

The second question is equally significant because, in considering the extent to which India's future growth may be different – faster – than in the past, it is useful to draw inferences from the performance of a number of other highly successful economies in the region. In 1993, the World Bank explained the so-called "East Asian Miracle" as follows:

> "The high performing Asian economies (HPAEs)…differ from other developing economies in three factors that economists have traditionally associated with economic growth. High rates of investment, exceeding 20% of GDP on average between 1960-1990, including in particular unusually high rates of private investment, combined with high and rising endowments of human capital due to universal primary and secondary education, tell a large part of the story. These factors account for roughly two-thirds of the growth in the HPAEs. The remainder is attributable to improved productivity. Such high levels of productivity are quite unusual…This superior productivity performance comes from the combination of unusual success at allocating capital to high-yielding investments and at catching up technologically to the industrial countries".[2]

The World Bank also observed that this Asian economic performance did not happen by chance: were economic growth randomly distributed, there would have been only about a one in ten thousand chance that East Asia's success would have been so regionally concentrated. Fundamentally sound development policies and sound macro management in East Asia were, in the judgement of the Bank, major factors in achieving rapid growth. But the World Bank also noted that there was, nevertheless, significant government intervention which, judging from experiences in other parts of the world, did not always reconcile easily with promoting growth.

This was a prophetic warning. Four years later there came the Asian crisis, caused in part by governments not having allowed markets to develop as completely and as efficiently as they might have. Ten years on and, following major structural reforms, the East Asian economies are booming again. Thus, history – both India's own and that of its Asian peers – provides cogent lessons in how fast India could grow over the coming decade.

But lessons from history are useful only up to a point. It is just as important to assess the potential – both economic and political – for further structural reforms which are essential to sustain and improve upon India's recent impressive growth performance.

The next chapter of this report examines India's recent economic growth acceleration and presents evidence of structural changes, led by the business sector, which are similar to the experiences of other large Asian economies during the early stages of economic take-off. The third chapter discusses the growth accounting framework, which is a key tool in accounting for why an economy grew as it did. However, growth accounting has limitations when forecasting the future – in particular, it fails to take adequate account of dynamic interactions in an economy, especially a developing one which has reached "take-off". To forecast the future, growth accounting as applied to India needs to be coupled with an in-depth consideration of the country's policies, reforms and political challenges, which are the focus of the fourth chapter. The fifth chapter pulls together the various strands of the preceding three and concludes that, with the right reforms, India could grow sustainably by about 10% over the next decade. Finally, we look at the implications of our projections for India's economic growth for equity, fixed income and foreign exchange strategy as well as the prospects for stocks in specific sectors.

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[1] *Dhokalia, B. (2001). Since 2002, Professor Dholakia has been Director of the Indian Institute of Management, Ahmedabad.*

[2] *The World Bank (1993), "The East Asian Miracle",* World Bank Policy Research Report*, Oxford University Press, p.8.*

CHAPTER 2: INDIA RISING

India's growth has accelerated progressively since the 1960s. From the "Hindu rate of growth" of 3.5% up to 1980, growth accelerated to 6.0% following the reforms of the 1980s and early 1990s.[3] Over the past four years, the growth performance has been even more impressive, averaging 8.5% per year; and, over the past fiscal year it was 9.4%, the fastest rate in 18 years (Figure 1). Faster growth has resulted in India becoming the world's 12th largest economy in 2006, with GDP of some US$900bn at current exchange rates; or the third largest (after the US and China) in purchasing power parity terms.

This progressive acceleration of India's growth, and particularly its performance over the past few years, could be a flash in the pan. But we doubt it. Our judgement is that India's low-cost economy is now reaping the rewards of market liberalisation, and that Indian companies are seizing the opportunities presented by new technologies and a more open economy. Significantly, a middle class is fast emerging, which is spurring demand as consumption and investment interact in a benign and dynamic way.

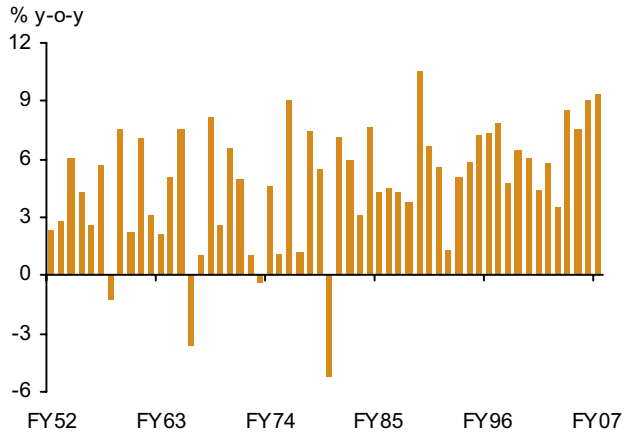
India is increasingly exhibiting many of the characteristics which were evident in the early "take-off" phases of other large Asian economies. For example, over the past four years not only has the growth of India's GDP accelerated, but so too has the growth of GDP per capita; and it appears to be taking on a trajectory similar to that of China and South Korea during their early growth accelerations. If this is indeed so, it suggests a huge, and as yet untapped, potential for India (Figure 2).

This chapter examines the nature of – and inferences which can be drawn from – the most recent phase of India's growth acceleration. But first it is important to make clear the distinction between cyclical ups and downs in the economy, and structural medium-to-long-term trends, for it is the latter that this report is about.

India's exposure to a global economic downturn

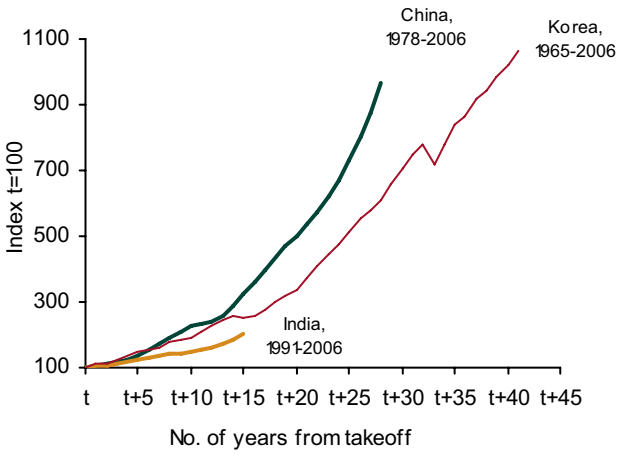
The current global economic outlook is highly uncertain. Our baseline view is that a modest US-led global slowdown is in train, with the risks tilted to the downside. Macroeconometric model simulations show that India is among the least exposed economies in Asia. The IMF estimates that a one percentage point (pp) fall in US GDP growth would reduce India's growth by 0.1-0.2pp (IMF, 2007a), while the Asian Development Bank (2007) estimates that it would reduce Asia ex-Japan's aggregate growth by 0.8pp.

Figure 1. India's real GDP growth



Source: CEIC and Lehman Brothers.

Figure 2. Real GDP per capita during takeoffs



Source: World Bank, CEIC and Lehman Brothers.

[3] *Ever since the reforms initiated in 1980s, India has not reported a single year of negative GDP growth.*

However, models may not capture all the channels, nor take into account all the feedback and multiplier effects. We judge that India would be much more affected by US GDP growth weakening from 1% to 0% than from 2% to 1%. India is exposed through four main channels:

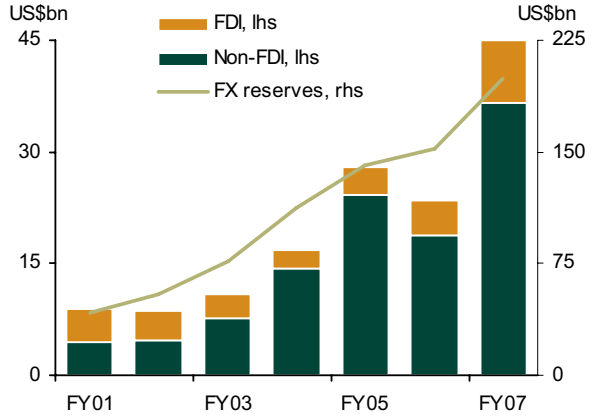
1. Exports: India's economy has rapidly become more open, with its exports having risen sharply to 23% of GDP from 11% a decade ago, although this is still less than half the ratio for Asia ex-Japan. The US is the destination for 15% of India's goods exports and about 70% of India's service exports. A sharp downturn in India's exports would likely have spillover effects on its domestic economy, as firms reduce capex and jobs.

2. Financial intermediation: India's credit risk remains low: the credit-to-GDP ratio is only about 45% and the Reserve Bank of India (RBI), India's central bank, has been proactive in tightening provisioning standards and increasing risk weights. Still, India's financial institutions are not immune to the rise in global risk aversion. Investors are demanding a higher premium for holding risk, and Indian firms have recently been sourcing a larger share of their funds through overseas borrowing, equity and commercial paper to offset the domestic bank credit slowdown. But, with most of these routes now either more expensive or less readily available (the government tightened rules on external commercial borrowings, or ECBs, on 7 August 2007), firms are likely to depend heavily on domestic funding via bank credit. There is a risk that Indian banks tighten their lending standards at a time when firms need to increase their borrowing.

3. Capital flows: India has received robust net capital inflows, particularly non-FDI. During FY04-FY07, of India's total net capital inflows, a cumulative US$94bn (or 83%), were non-FDI, especially ECBs and portfolio equity flows (Figure 3). At first glance, India appears vulnerable to short-term capital flight were global risk aversion to rise. However, the RBI has built up an enormous buffer of FX reserves: US$236bn-worth. To assess India's external vulnerability, we conducted stress tests under two scenarios: (1) exports of goods and services decline by 20%; and, (2) exports fall by 20% and non-FDI net capital inflows fall by 50%. Even under scenario (2), the number of months covered by India's FX reserves declines only from 13.6 to 10 – still more than adequate – while the ratio of short-term debt to FX reserves remains low, at under 10% (Figure 4).

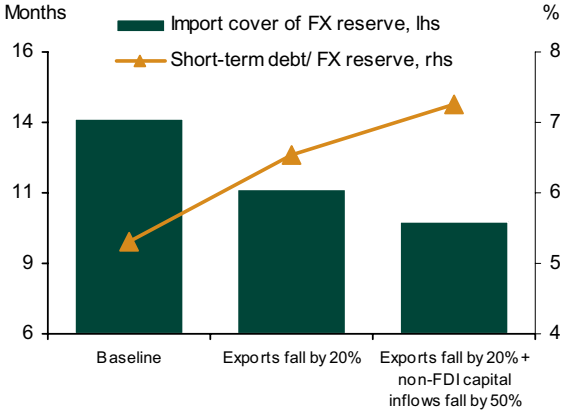
4. Wealth effect: Sharp portfolio outflows can exacerbate equity corrections resulting in negative effects on confidence, household wealth and business balance sheets. However, in India macroeconomic linkages with asset prices are still embryonic. A recent study by the IMF (2007c) found that direct holdings of shares account for only 2% of Indian household wealth, and that a 10% increase in the stock market index is associated with an increase in consumption of only 0.1%.

Figure 3. Net capital inflows and FX reserves



Source: Bloomberg, RBI and Lehman Brothers.

Figure 4. Stress test of India's FX reserves



Source: CEIC, RBI and Lehman Brothers.

As long as US GDP grows by about 1.5% or more in 2008 – our baseline view – the impact on Indian GDP growth should be relatively mild. However, if US GDP growth falls to below 1%, causing a severe global economic downturn, the impact is unlikely to be linear, as weakening economic growth, asset prices and confidence feed off each other within and across countries.

Structural shift versus cyclical challenge

Provided the global economy avoids a severe downturn, we expect India's GDP to grow by 8.8% in FY08, before picking up to 9.2% in FY09. Often an economy's growth can accelerate for a few years but then run into capacity constraints which trigger overheating and provoke a policy tightening, returning growth to a slower path. That this might be the case in India has been a concern frequently voiced, both domestically and more widely, notably early in 2007 when inflation was rising. And policymakers – rightly in our view – remain alert to this risk.

However, international experience shows that, under certain circumstances, economies can experience growth accelerations which are more structural than cyclical. And, while inflation may accelerate in the process, economies in this situation may nevertheless manage to remain sustainably on the higher growth path without overheating seriously. For this to happen, the growth acceleration must be capacity-enhancing, whether because factor inputs grow faster – i.e. more labour and/or capital is employed – or because the existing inputs are used more efficiently (i.e. higher productivity). We judge that such a structural acceleration in growth is happening in India today, lifting the economy's potential output growth rate.

Interpreting the cyclical situation. This is not to deny that India's transition to a higher growth trajectory is signalling some mild cyclical elements. Rakesh Mohan[4], Deputy Governor of the RBI, notes that "it is important to disentangle the structural and cyclical components underlying the growth process. It is necessary to note that a cyclical upswing is also underway in India since FY04 after a prolonged trough which began in 1996." But it is far from clear that the economy is overheating: additions to productive capacity usually result, albeit with a lag, in downward pressure on prices so that, at first, it is difficult to distinguish symptoms of overheating from those of rapid – and, significantly, more sustainable – economic development. Consider the three symptoms often presented as signs that India's economy may be overheating:

- **Inflation.** Wholesale price inflation (WPI) rose to 5.4% in FY07 from 4.4% during the previous year. However, this is a mild impulse given that the economy has accelerated to over 9% growth. Importantly, there is no evidence of a change in India's growth-inflation trade-off: in economists' parlance, India remains on its short-run Phillips curve (Figure 5).[5] Food prices were an important driver of the higher inflation rate, reflecting India's structurally weak agricultural sector and robust global demand; but another reason has been the boom in investment. This investment surge first affects demand – witness the sharp rise in the prices of metals and cement. But, with a lag, it also enhances supply, thereby easing price pressures.[6] To an extent, inflation also manifested itself through rising housing prices. Residential prices in cities such as Bangalore and Delhi more than doubled in the four years to 2005. The RBI responded by raising interest rates and increasing the risk weighting and provisioning requirements on banks for housing loans, which has helped to temper the housing bubble and ease inflation below the central bank's target of 5.0%. According to media reports, transactions have dropped to almost half of their previous levels, and a 5-10% drop in real estate prices is visible in suburbs

[4] *Mohan (2007).*
[5] *The periods 1991-99 and 2000-07 also witnessed a significant downward shift and a flattening of the Phillips curve. Not only has there been a structural fall in inflation for every level of growth, probably part of the global "wage moderation" process, but every increase in growth now apparently requires a smaller trade-off in terms of higher prices – i.e. there has been a flattening of the Phillips curve.*
[6] *China and Japan experienced comparable higher inflation during their growth transitions; but inflation later stabilised as induced investment – and strong productivity – added to capacity.*

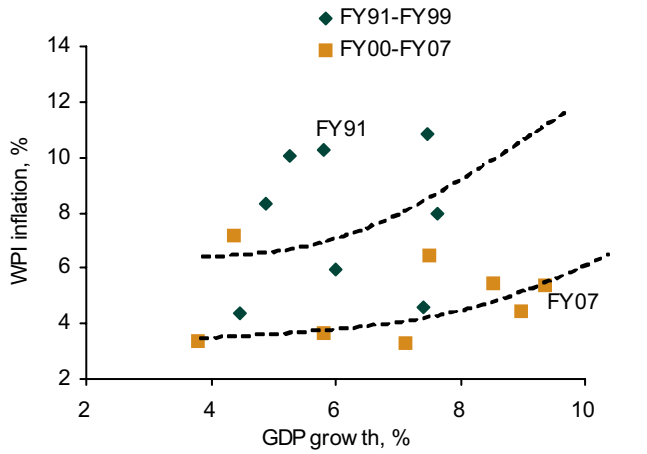
such as Kharghar in Navi Mumbai, Greater Noida near Delhi, and Bangalore's Hosur Road.[7]

- **Credit.** The combination of robust economic growth, financial liberalisation and a rising middle class has led to credit growth of more than 30% over the past two years, twice as fast as nominal GDP. Clearly, such a pace is not sustainable in the medium run. But it started from a low base: private non-food credit comprised only 45.6% of GDP in March 2007, a low share by international standards (Figure 6). Moreover, as a result of monetary policy tightening, credit growth has recently started to ease – to 23.4% y-o-y by the mid of September 2007.
- **Current account deficit.** India's current account registered a modest deficit of 1.0% of GDP in June 2007 on a 4-quarter rolling basis, which may well widen. But there is nothing intrinsically wrong with a developing economy running small current account deficits and it is not necessarily a sign of overheating. In theory, the "natural" direction for foreign capital to flow is from developed economies to developing ones. The developed economies would be net savers with current account surpluses, allowing them to benefit from higher returns and increased diversification of their investments; the emerging economies would be net borrowers and, with (small) current account deficits, would have sufficient funds to make investments to develop and grow.

We are therefore not particularly troubled by India's recent inflation performance and consider neither that, nor the pace of credit growth, nor the balance of payments situation indicative of serious overheating.

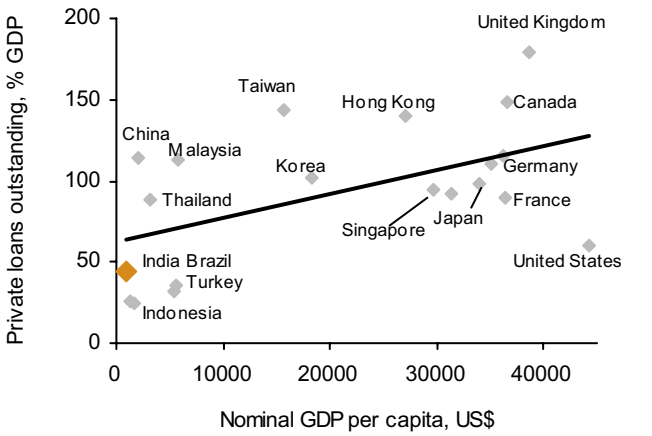
Evidence of structural acceleration. On the other side of the issue, there is growing evidence that India's growth acceleration is more structural than cyclical, with an investment boom and high productivity enhancing the economy's capacity. Gross domestic investment as a share of GDP has increased from 28.0% in FY04 to around 35% in FY07, while gross domestic savings have risen from 29.7% to around 34% (Figure 7).

Figure 5. Inflation and growth trade-off in India



Source: World Bank and Lehman Brothers.

Figure 6. Private credit/GDP vs GDP per capita 2006



Source: IMF, CEIC and Lehman Brothers.

[7] *"Real estate prices see a sharp decline"*, Hindustan Times, *18 May 2007*.

Robust government revenue meanwhile is providing room for much needed public infrastructure spending; and bigger structural changes still have been occurring in the corporate sector. Gross corporate savings have jumped from 4.7% of GDP in FY04 to 8.1% in FY06, while the average debt-equity ratio for the Bombay Stock Exchange (BSE) 500 companies (excluding banks) declined from 120% in the first half of the 1990s to 54% over FY04-FY07. Ample sources of funds and healthy balance sheets are underpinning a boom in corporate investment, which surged from 6.7% of GDP in FY04 to 12.2% in FY06.

Corporate profits have grown by over 20% y-o-y in recent years despite accelerating wage growth, higher raw material costs and a tightening of monetary policy (Figure 8). All this is consistent with productivity picking up, spurred by the diffusion of new technologies and rising competition – within India and, increasingly, overseas. One indicator of capital productivity is the incremental capital output ratio (ICOR) which measures the ratio of the investment rate (investment/GDP) to the GDP growth rate. The lower the ICOR, the bigger the growth "bang" for the investment "buck". India's ICOR has come down to under 4.0 in FY07, from more than 4.5 in early 2000 (Figure 9).

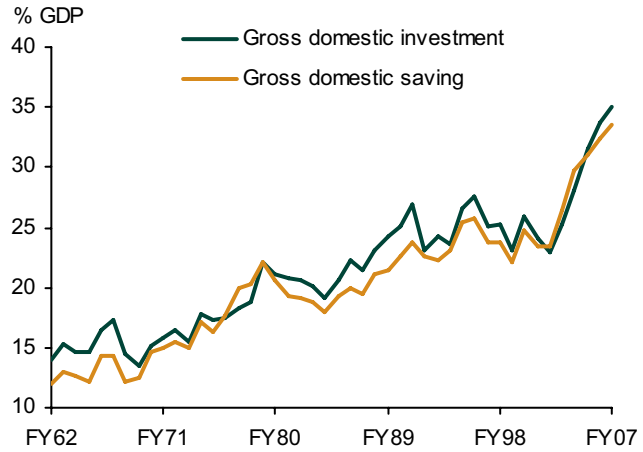
A recently documented example of how the diffusion of new technologies can boost productivity is the impact of mobile phone technology on the Kerala fishing industry.[8] It was found that the private-sector roll-out of mobile phone technology drove significant improvements in market efficiency leading the author of the study to conclude that "Information makes markets work, and markets improve welfare".

The nub of the issue is that, before they had access to mobile phone technology, fishermen would simply land their catch at the nearest port, which tended to create gluts (and, thereby, low sale prices) on some parts of the coast, and shortages on others. However, by adopting mobile phones the fishermen were to garner up-to-the-minute information on the market along the coast and to bring their catch ashore where demand – and therefore prices – was most favourable.

While this lesson is not necessarily easily transferable to agriculture in India's interior, it hints at the sort of welfare improvements which the spread of mobile phone technology can help to underpin, if other barriers to economic development, including transportation of goods, can be eased.

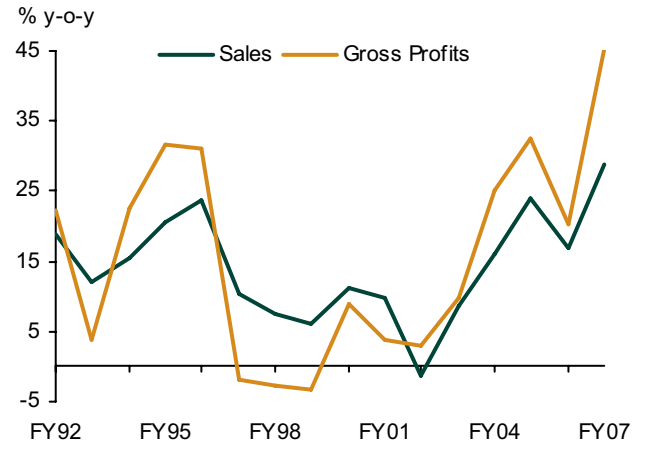
India is starting to look like other economies in take-off. Reinforcing our judgement that India's most recent growth acceleration since FY03 is not a flash in the pan are four

Figure 7. India's domestic saving and investment



Source: CEIC and Lehman Brothers.

Figure 8. Private corporate financial performance



Source: RBI and Lehman Brothers.

[8] *"The Digital Provide: Information (technology), market performance and welfare in South Indian fisheries sector" by Robert Jensen,* Quarterly Journal of Economics, *2007, vol. 122, issue 3, pages 879-924.*

major signs that India's economy is taking on key characteristics experienced by other large developing economies, such as China and Korea, during the early stages of their take-off (see *Box 1: Economic take-off – definitions and drivers*).

First, the spurt in India's GDP per capita, to about US$800, is resulting in a rapidly growing middle class. According to one recent study, India's middle class – defined as those with incomes between US$4,400 and US$22,000 – has increased to 13m households or about 50m people.[9] As a result, India is experiencing surging demand for consumer durable goods such as cellular mobile phones, ownership of which has increased exponentially to 148m in August 2007 from 49m two years earlier. Annual domestic sales of microwave ovens grew by a hefty 29% in FY07. And, according to *TV Veopar Journal*, an Indian home-appliances publication, usage of high-end "frost-free" refrigerators is growing faster than that of traditional "direct cool" ones – a good example of growing income and aspiration levels.

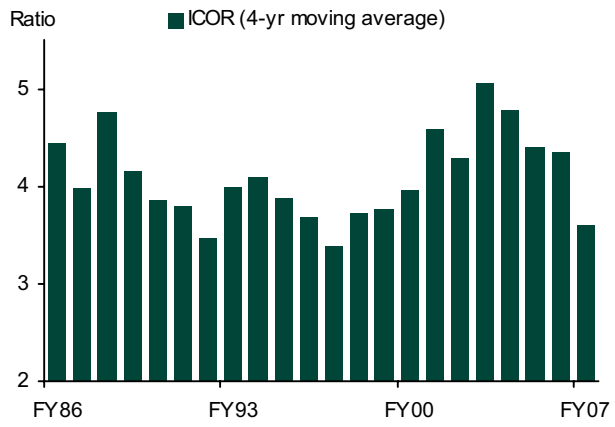
Second, as India's finance minister, P Chidambaram remarked in parliament, "There is an investment boom in the country. It appears that India is catching up with the high investment rates of East Asia and China." India's investment-to-GDP ratio, estimated at around 35% in FY07, is now in the 30-40% range which was regarded by many analysts as intrinsic to the Asian miracle (see Figures 11 to 16).

Third, there is the dramatic opening up of India's economy, as occurred in China and Korea. The ratio of trade (exports plus imports) to GDP surged to 49% in FY07 from 31% just three years earlier. The number of visitor arrivals to India has doubled in the past five years, to 4.7m in FY07. And foreign direct investment (FDI) inflows more than doubled to US$19.4bn in FY07 from US$7.7bn in FY06.

Fourth, Indian companies' sourcing of finance, from both local and international capital markets, has begun to take off. From less than US$6.5bn financed through the capital markets just five years ago, India Inc. raised about US$30.7bn in FY07, according to statistics from the Reserve Bank of India.

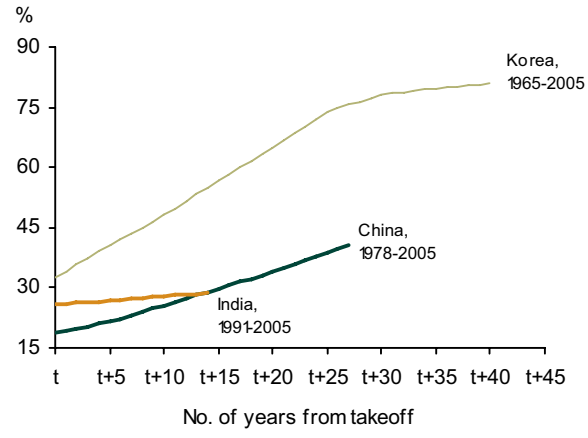
Encouraging though these developments are in their own right, they tell only part of the story. Compared with the take-off experiences of China and Korea, India appears to be at a relatively early stage which suggests that there remains substantial – perhaps enormous – potential to be tapped. A powerful indicator of this is the still low degree of urbanisation: 70% of the Indian population still lives in the countryside, which is a comparatively high figure given India's level of GDP per capita (Figure 10).

Figure 9. India's incremental capital output ratio



Source: CEIC and Lehman Brothers.

Figure 10. Take-off in urbanisation rate



Source: World Bank and Lehman Brothers.

[9] *McKinsey and Co. (2007),* The Bird of Gold: The Rise of India's Consumer Market*, McKinsey Global Institute.*

Box 1: Economic take-off – definitions and drivers

Over the past four years India has met most of the criteria used in studies to define and describe economic take-offs.

The definition

Economic "take-off" is a nebulous term. W.W. Rostow (1960) was the first to use it in the context of economic growth analysis. Rostow conjectured that economies evolve in stages and that "…take-off is the interval when the old blocks and resistances to steady growth are finally overcome. The forces making for economic progress, which yielded limited bursts and enclaves of modern activity, expand and come to dominate the society. Growth becomes its normal condition."

Recent studies have used more specific, and progressively more complicated, definitions of "take-off". Easterly (2005) defined take-off as real per capita GDP growth increasing from the -0.5% to 0.5% range to "permanent" stability above 1.5%. Aizenman and Spiegel (2007) define take-off as transition from stagnation to robust growth, where stagnations are defined as five-year periods with average real per capita GDP growth below 1% and robust growth is defined as a period of real per capita GDP growth exceeding 3%. The Aizenman and Spiegel definition is particularly stringent, requiring real per capita GDP growth to exceed 3% for five consecutive years and to occur within ten years of the stagnation period.

On the other hand, Hausmann *et al* (2004) define growth acceleration as an increase in real per capita income growth of 2.0% or more, sustained for at least eight years. Pritchett (2000) defined an accelerator, which is similar to a take-off, as the case where real per capita income growth was below 1.5% prior to a structural break and then above 1.5% after the break.

The drivers

In a study of 146 country experiences, Aizenman and Spiegel conclude that it is policy which does much to determine whether or not countries move from low-growth episodes to take-off. Other factors are important too, however, notably increased trade and capital account openness and higher average education levels. Changes in political regime, or the end of a war, may also be important predictors of acceleration episodes. Countries with a higher share of services – compared with commodities – in their total output are more likely to sustain a take-off because they are, in general, less susceptible to commodity price shocks.

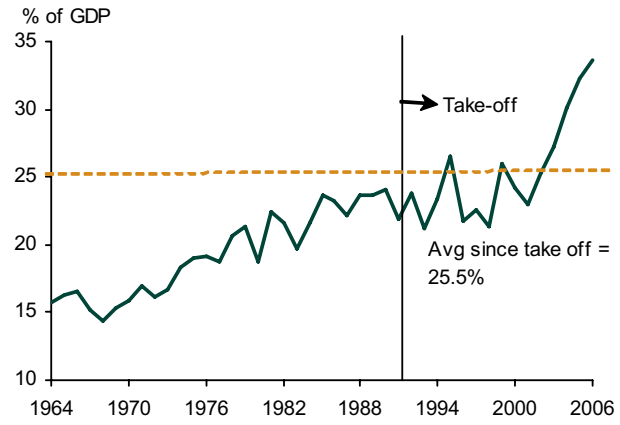
Hausmann *et al*'s study of growth acceleration for 110 countries between 1957 and 1992 shows that such accelerations are quite frequent. They find accelerations to be correlated with increases in investment and trade, political regime change, economic reforms and real exchange rate depreciations. Interestingly, they also conclude that most accelerations are highly unpredictable.

India's experience

With real growth in GDP per capita averaging 6.9% since FY03; with the trade-to-GDP ratio doubling over the past seven years to 50%; and with services comprising 55% of GDP, we conclude that India is exhibiting growing evidence of being in the early stages of economic take-off. y

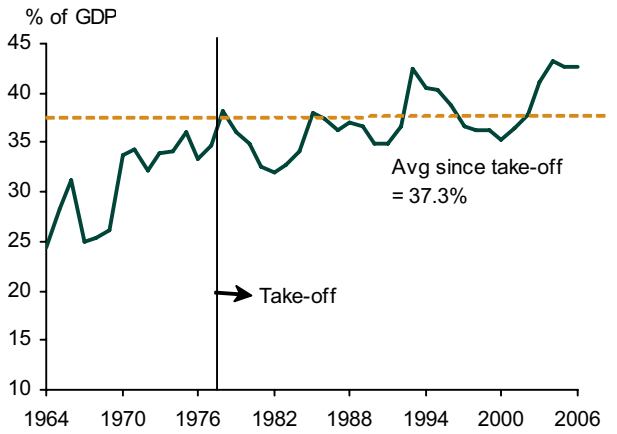
INVESTMENT-TO-GDP RATIOS ACROSS COUNTRIES AROUND TAKE-OFFS

Figure 11. India



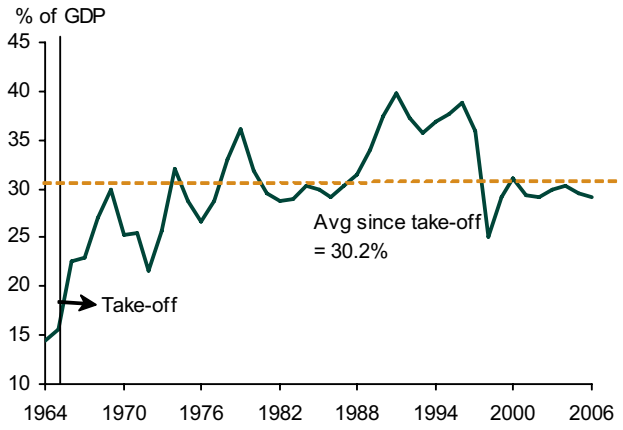
Source: World Bank, CEIC and Lehman Brothers.

Figure 12. China



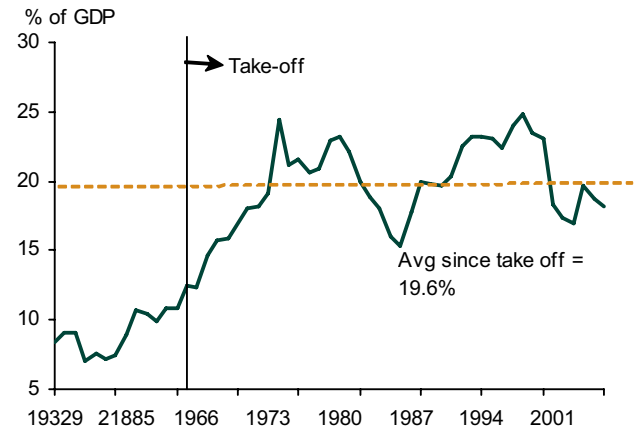
Source: World Bank, CEIC and Lehman Brothers.

Figure 13. South Korea



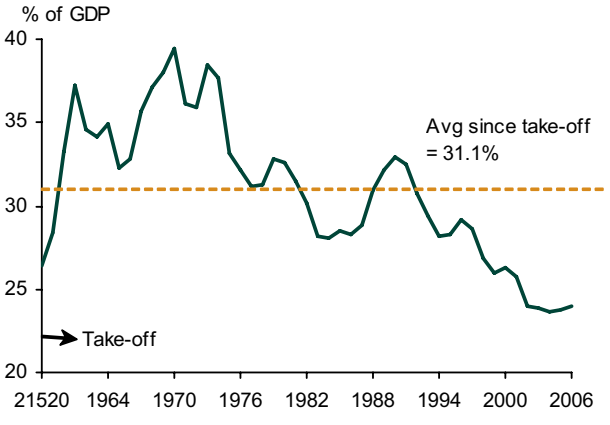
Source: World Bank, CEIC and Lehman Brothers.

Figure 14. Taiwan



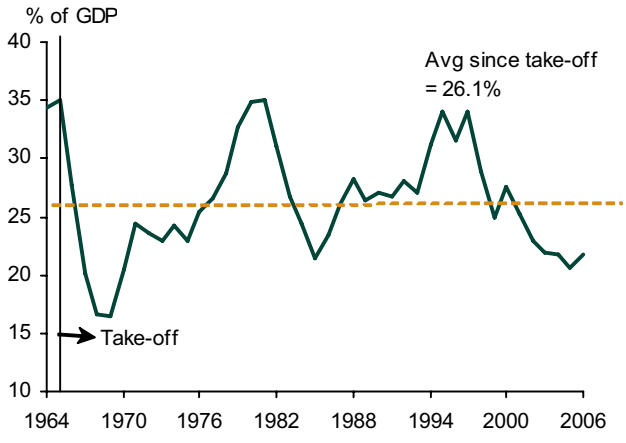
Source: World Bank, CEIC and Lehman Brothers.

Figure 15. Japan



Source: World Bank, CEIC and Lehman Brothers.

Figure 16. Hong Kong



Source: World Bank, CEIC and Lehman Brothers.

Business is carrying the baton

None of this is to suggest that business does not face significant challenges in its role as the primary engine of take-off (see Chapter 4: Economies of scale and competition). Perhaps the most impressive aspect of India's recent economic performance has been the ability of the private sector to work around the structural and systemic challenges it faces.[10] Business's responses to these challenges range from "hard" infrastructure, for example installing private electricity generation capacity, to "soft", for example training programmes for employees, whether in-house or working with higher education establishments.

While such a response clearly involves costs, both to business and the overall efficiency of the economy, the private sector has tended to see such steps as an opportunity to form partnerships and work successfully within the existing system. Common types of partnership include:

- private-public partnerships for infrastructure projects (see *Box 16: Financing India's infrastructure deficit*);
- private companies partnering with universities to work around the skilled labour constraint;
- private companies partnering with each other to build efficient supply chains; and,
- private companies partnering with foreign investors.

Underpinning this is what the socio-economic commentator and former senior diplomat, Pavan K Varma, describes as the Indian "instinct for jugaad" i.e.

> "…[a] creative improvisation, a tool to somehow find a solution, ingenuity, a refusal to accept defeat, initiative, quick thinking, cunning, resolve, and all of the above".[11]

Putting this in a business context, Mr Varma elaborates:

> "…as Silicon Valley has shown, given the right environment [Indians] can be remarkably inventive. They have the ability to bridge two opposing worlds by just being themselves, part tradition, part modern. Most importantly, they have a burning desire to succeed, to partake of the good life. The aspiration to upward mobility makes them exceptionally focused and hard-working. Instinct and conditioning have taught them how to get around a problem… Circumstances have taught him (sic) how to take the failure of the system in his (sic) stride and find a solution anyhow".[12]

Given this "instinct for jugaad", there appears to be a serious possibility of business being able to continue to carry the baton of economic growth through to 2012 at least, i.e. the final year of India's latest Five-Year Plan. A relatively low-key but important series of policy decisions which the government has been taking to open up new areas of business to large private enterprise is also set to help.

The Indian Government Planning Commission has just released a consultation paper projecting that investment of about US$492bn will be needed by FY12 to upgrade the country's infrastructure[13], and expects about 30% to be financed by the private sector – a share which is looking increasingly feasible. K.V. Kamath, CEO of ICICI Bank, India's biggest private lender, projected in April 2007 that Indian private companies will invest US$500bn over the coming three years, with about US$300bn of this earmarked for infrastructure and infrastructure-related projects.

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[10] *An oft-cited example of India's entrepreneurial zeal is Mumbai's Dabbawalas, an association of 5,000 lunch deliverymen who make lunch box deliveries to the city's workers with almost faultless efficiency despite the infrastructure problems.*

[11] Being Indian *by Pavan K Varma (Arrow Books, 2004), page 67.*

[12] *Ibid, page 132.*

[13] *'Projections of Investment in Infrastructure during the Eleventh Plan' a consultation paper by the Planning Commission of the Government of India, 24 Sep. 2007.*

Areas where private enterprise is already having a major impact include:

- **Civil aviation.** This led initially to a boom in budget airlines and is now stimulating the privatisation of airports and significant investment in air transport infrastructure.
- **Oil and Gas**. The sector is deepening and broadening, with major exploration and exploitation of new gas fields and related development of infrastructure. This is seen by many commentators as an object lesson for the still-closed mining sector, as well as providing a powerful argument in favour of the government implementing the stalled 2003 electricity law.
- **Telecom**. India is currently making more than 5.5m new mobile phone connections per month, most notably in rural areas where telecom has previously been largely absent. Perhaps the most significant immediate benefit is to give farmers better access to market information.
- **Banking**. A consumer credit culture is taking hold and India's large private banks, such as ICICI, are in the vanguard with initiatives such as micro credit and micro insurance.
- **Retail**. Until recently there was almost no organised retailing in India, but the partial opening up of the retail sector at the end of 2006 has already stimulated a surge in setting up medium-sized grocery stores (albeit in the face of political resistance in some parts of the country). The Indian conglomerate Reliance alone is planning to invest INR250bn (US$6.3bn) in 5,000 shops, including hypermarkets, aiming at annual sales of US$25bn by 2010 (although a recent political backlash in some parts of the country may lead to the company to reduce this target).
- **Real Estate Development**. From the outset real estate development has been driven by the private sector and it has recently received a major boost from private equity and an influx of foreign funds taking stakes in Indian companies. This has allowed developers of commercial, residential, hotel and hospital projects in particular to scale them up to a size at which it is financially viable to install basic utilities.
- **Containerised Rail Transport.** In January 2007, the government signed public-private partnership agreements with 14 companies, which stands to break the state monopoly in cargo business and is expected to increase the Indian Railways' container traffic to 100m tonnes (mt) by 2012 from 21 mt presently.

In addition to these sectors, the private sector has also made inroads into both domestic and export markets in such diverse sectors as pharmaceuticals, automobiles, metals, cement, textiles and hotels (see *Box 2: Manufacturing: India's new powerhouse*). The dynamism of the corporate sector is also evident in the number of new companies in India's 50-largest list, compared with 15 years ago (see Box 3: Dynamics within India's top 50 companies).

While specific measures are providing significant private enterprise opportunities within individual sectors, even more important should be their cumulative impact. As T.N. Ninan wrote at the time of the rail containerisation announcement:

> "…the development of these businesses will bring about system-wide efficiency improvements, and also create export possibilities – agri-exports could finally take off as people work out cold chains and efficient supply links".[14]

*14 "Growth Drivers" by T.N. Ninan (*Financial Times *website, 9 January 2007).*

Box 2: Manufacturing: India's new powerhouse

Growth has been driven by aggressive inroads made in the export and domestic market by different sectors.

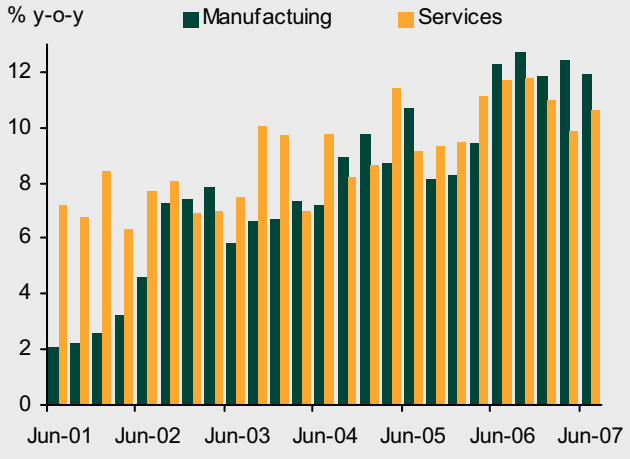
The information technology (IT) and IT-enabled services sector has long been the standard bearer of India's international fame. Low costs, the availability of skilled and English-speaking labour and fast turnaround times have worked to India's advantage, leading to the popular perception that its growth has been services-led. However, in the past three years there have also been significant developments in manufacturing where growth has averaged 9.9% and, at 12.3% in FY07, is now even faster than that of the services sector (at 11.0%) (Figure 17).

The manufacturing success story extends to many sectors, particularly capital-intensive ones, including pharmaceuticals, automobiles, metals, cement, telecoms and textiles (Figure 18). The drivers at the macro level are usually similar: firms have focused on increasing their sales, productivity and profits through more efficient use of technology, capital and labour. They have passed lower costs onto consumers in order to gain market share. Firms have funded organic and inorganic growth through strong retained earnings, thereby avoiding excessive leverage.

At the micro level, however, sector strategies have differed. The auto, pharmaceutical and textile sectors, for example, have concentrated primarily on capturing export markets for growth. For auto companies, India has emerged as the global hub for small car manufacturing through increasing indigenisation, process improvement, economies of scale and lower costs: the industry has registered robust 21% y-o-y growth in sales volume over the past three years. In the pharmaceuticals sector, where output volumes have grown at 21% y-o-y, exports have been the main market; low costs and aggressive inorganic growth have helped firms in formulation and bulk drug manufacturing, as well as increasing their presence in R&D such as drug discovery and clinical trial services. Textile firms meanwhile have posted a 17% y-o-y growth in sales and 26% in net profit, following the removal of the quota regime, which has enabled them to capture a greater share of export markets, notably in the United States and Europe.

Other sectors, such as cement, iron and steel and telecom, have depended largely on the domestic market to expand. For example, the growth in cement and iron and steel has primarily been buoyed by rising demand from indigenous infrastructure, housing and industrial construction. Even in services such as transport and communication, the ability to reduce costs and prices has been the key to the volume-led growth most notable in the telecom and aviation sectors. Banking has gained from the rapid growth in retail and corporate credit. y

Figure 17. Growth in the manufacturing & service sectors



Source: CEIC and Lehman Brothers.

Figure 18. Sector growth rates

	Net sales growth		Net profit growth	
% y-o-y	FY02-FY04	FY05-FY07	FY02-FY04	FY05-FY07
Auto & auto parts	20.3	21.4	55.9	17.3
Banking & services	4.9	21.9	37.5	21.6
Cement	16.7	32.9	58.9	119.4
Engineering	10.7	33.4	31.3	59.0
Hotels	15.6	29.6	27.4	78.7
IT	21.9	36.3	13.7	41.7
Infrastructure	41.6	47.2	99.0	136.0
Oil & gas	12.8	23.8	39.6	13.7
Pharmaceuticals	18.0	21.1	28.5	34.0
Steel & non-ferrous	33.6	22.7	*	23.9
Telecom	-12.7	52.7	-35.7	95.4
Textiles & machinery	8.1	17.2	*	26.4
Transportation	12.3	20.5	43.8	-9.2
Utility & Power	5.5	15.2	16.5	8.1
Grand Total	12.6	24.1	41.7	26.4

Note: Results represent a sample of 1825 companies.

**Either numerator or denominator is negative.*

Source: Capitaline and Lehman Brothers.

Box 3: Dynamics within India's top 50 companies

Changing growth dynamics have altered the entire landscape of Indian firms over past 15 years.

The Indian economy has gone through a dynamic change over the past 15 years with robust growth, rising per capita income, increased consumer demand and changing consumer preferences. Not surprisingly, a similar change has swept through some of the largest Indian companies which have led this growth acceleration. Figure 19 shows the top 50 Indian listed companies by market capitalisation in 1992 and more recently in 2007. The key observations are:

- A number of new companies make it to the top 50 list, with only 14 companies from the earlier period still present. Top companies such as Reliance, Tata Motors, State Bank, ITC, Hindalco and Hindustan Lever have consistently maintained their top market cap position. Market capitalisation of the 14 companies which still make it to the top 50 list has increased enormously with Reliance, the largest company, currently at a market capitalisation of US$80.3bn.
- In 1992, the equity market was dominated by manufacturing industries, with only six service-sector firms in the top 50. The subsequent rapid growth in the services sector has resulted in an increase in the total number of services firms to 18. Sectors which dominated in 1992 included fertilisers, chemicals, engineering, textiles, shipping and automotive companies. The boom in services has led to the dominance of IT, telecoms and financial services in 2007.
- Commodity sectors, both energy and metals, have also joined the top 50 list in 2007 with companies such as Oil and Natural Gas Corporation, Indian Oil and Steel Authority of India among the top 50.
- As of end-September, about 26 companies have a market cap of more than 1% of GDP in 2007 compared with only three in 1992. This reflects the greater economies of scale achieved by Indian firms. Given that Indian firms will likely continue to seek further scale globally, we expect this trend to become more pronounced.

Figure 19. India's top 50 companies by market capitalisation

Rank	Company	US$bn	Rank	Company	US$bn	Rank	Company	US$bn	Rank	Company	US$bn
		As on March 31, 1992						As on September 28, 2007			
1	State Bank of India	7.32	26	Bombay Dyeing	0.54	1	Reliance Industries	80.32	26	Suzlon Energy	10.46
2	Tata Steel	4.41	27	Essar Gujarat	0.54	2	O N G C	51.43	27	Reliance Capital	9.77
3	ITC	2.92	28	Great Eastern Shipping	0.53	3	Bharti Airtel	44.83	28	Hind.Zinc	8.62
4	Reliance Industries	2.13	29	Tata Timkem	0.49	4	NTPC	40.04	29	Idea Cellular	8.28
5	Hindustan Lever	2.03	30	Nestle India	0.48	5	DLF Ltd	32.65	30	Grasim Industries	8.09
6	Tata Motors	1.69	31	Castrol (India)	0.47	6	Reliance Comm.	30.06	31	Cairn India	8.08
7	Associated Cement Co.	1.57	32	Century Enka	0.47	7	ICICI Bank	29.67	32	GAIL (India)	8.04
8	Century Textiles	1.28	33	Indian Aluminium Co.	0.46	8	Infosys Tech.	27.19	33	Kotak Mah. Bank	7.56
9	Grasim Industries	1.17	34	Motor Industries Co.	0.46	9	TCS	25.96	34	Tata Motors	7.53
10	Tata tea	1.12	35	Britannia Industries	0.44	10	State Bank of India	25.77	35	Satyam Computer	7.44
11	Tata Chemicals	0.95	36	Apollo Tyres	0.42	11	B H E L	24.98	36	Maruti Suzuki	7.25
12	Larsen & Toubro	0.94	37	Madura Coats	0.42	12	S A I L	21.47	37	GMR Infra.	7.23
13	Gujarat State Fertilizers	0.92	38	Gujarat Ambuja Cement	0.37	13	Larsen & Toubro	20.23	38	Reliance Energy	6.91
14	Colgate Palmolive	0.88	39	Indian Rayon	0.37	14	ITC	17.92	39	A B B	6.88
15	Master Shares (UTI)	0.86	40	National Organic Chem.	0.36	15	Natl. Mineral Devt. Corp.	17.42	40	Axis Bank	6.84
16	Cochin Refineries	0.84	41	Raymond Woollen Mills	0.36	16	Reliance Petro	17.34	41	Bajaj Auto	6.45
17	ICICI	0.79	42	Birla Jute Industries	0.36	17	H D F C	17.20	42	Jaiprakash Assoc	6.02
18	Chemicals & Plastics India	0.68	43	Oswal Agro Mills	0.36	18	Wipro	16.84	43	Power Fin. Corp.	5.80
19	Hindalco	0.67	44	Ingersoll Rand India	0.35	19	Mineral & Metal Trading	16.53	44	Siemens	5.72
20	Bajaj Auto	0.66	45	Mazda Industries	0.35	20	Indian Oil	14.08	45	ACC	5.62
21	Brooke Bond India	0.66	46	Seimens	0.33	21	Sterlite Inds.	13.31	46	Ambuja Cem.	5.49
22	Indo Gulf Fert. & Chem. Co.	0.58	47	Ashok Leyland	0.33	22	Tata Steel	13.00	47	Hindalco	5.30
23	Gujarat Narmada Fert. Co.	0.57	48	VST Industries	0.33	23	HDFC Bank	12.77	48	HCL Technologies	5.00
24	Jaiprakesh Industries	0.57	49	ITC Bhadrachalam	0.32	24	Unitech	12.53	49	Natl. Aluminium	4.88
25	Shipping Credit Co.	0.56	50	SKF Bearing (India)	0.3	25	Hindustan Lever	12.16	50	Sun Pharma.	4.83

Source: BSE, DataStream and Lehman Brothers.

One sector in which opportunities abound is agriculture. Currently, an estimated 30% of food products rots en route to market. Hence, when put alongside the government's push towards raising the growth rate in the farm sector, the private sector's potential impact on the agricultural supply chain – "from farm to fork" – could be one of the most significant developments of the decade, not only for the economy as a whole but also for its direct impact on poverty alleviation (see Chapter 4: Foreign trade and investment). To quote Dr Raghuram Rajan, former Director of Research at the IMF:

> "Because poor infrastructure increases costs … low-margin labour-intensive industries may continue to be uncompetitive in India unless infrastructure improves. Similarly, value-added agricultural production will also remain a pipe dream. Improved infrastructure will allow greater access to markets and, thus, to jobs, and is an essential ingredient for job growth."[15]

Bottom line

Based on the evidence above, we judge that India's growth acceleration is not a flash in the pan. Rather, we conclude that important structural shifts underpin India's growth acceleration, suggestive of a dynamic growth process which has a reasonable chance of proving sustainable.

However, in any judgment of medium-term prospects it would be unwise to rely on an interpretation of just these most recent few years. To explore this issue further, it is necessary to consider the growth process in greater historical depth and detail. This is undertaken in the next chapter.

*15 See "From Paternalistic To Enabling" by Dr Raghuram G Rajan (*Finance & Development*, Sept 2006, Vol 43, No 3). Dr Rajan is currently the Eric J Gleacher Distinguished Service Professor of Finance at the University of Chicago Graduate School of Business.*

CHAPTER 3: ACCOUNTING FOR INDIA'S GROWTH

Introduction

In the previous chapter we interpreted the evidence of the past several years as at least suggestive of India's economy having entered a potentially self-sustaining, or take-off, process. If that diagnosis is correct, the conditions for take-off will not have built up overnight: they will have been consolidating for a number of years. Hence, an understanding of the progressive, longer-term rise in India's trend growth since the 1980s should illuminate the extent to which, or the conditions under which, India's most recent growth may prove sustainable.

Long-term growth performance has traditionally been analysed through the so-called "growth accounting" framework – a method which seeks to relate, or "account for", economic growth in terms of the growth of factor inputs, both capital and labour.

"Growth accounting" studies first became fashionable in the 1970s and 1980s. But problems with the data available for the most advanced economies, let alone for emerging ones, were considerable; and theoretical problems, ranging from measurement to the fundamental assumption that output can be represented by an input-constrained production function, have caused this approach to be seen as difficult.

Moreover, quantifying *ex post* the contributions which inputs have made to output, even if that can be done reasonably satisfactorily, tells only part of the story: while growth accounting quantifies *what* has happened on the input side of the story, it does not explain *why* inputs grew as they did and were able to produce the output that they did.

In other words, "growth accounting" is akin to taking a snapshot through the rear-view mirror when what is really needed is a movie taken through the windscreen.

What particularly needs to be understood are the dynamic processes whereby, when matters are going well, growth begets growth in a dynamic interaction between rising investment and consumption expenditures, and between public and private investment.

Examples of how the dynamic process can come into play include:

- when GDP per capita reaches a threshold, boosting demand for durable goods such as cars, as witnessed in China;
- when the economy opens up to foreign trade and investment, thereby promoting economies of scale in production and boosting productivity; and
- when improvement in economic fundamentals instils greater investor confidence, boosting investments still further.

As Kaldor, for example, emphasised repeatedly, growth in an economy is the product of:

> "…an interplay of static and dynamic factors [in] causing returns to increase with an increase in the scale of industrial activities."
>
> "This … is the basic reason for the [positive] empirical relationship between the growth of productivity and the growth of production which has recently come to be known as the 'Verdoorn Law'." [16]

It is instructive that the fast-growing Asian economies have exhibited the full interplay of these (dynamic) sources of growth revealing a strong relationship, across countries, between the rate of growth of output per worker and the rate of growth of output. In this context, India's labour productivity growth – of 3.8% per year on average over the 1980-2005 period – while impressive by India's own historical standards, represents only an average performance by Asian comparison: and India's labour productivity has evolved broadly as a cross-country Verdoorn-type relationship would suggest (Figure 20).

[16] *Kaldor, N. (1966).*

However, most serious is the failure of "growth accounting" to capture the role of economic reforms and prudent policies in assisting (or hindering) the growth of inputs. This problem is particularly acute in the case of India where the policy reforms initiated in the mid-1980s, and taken further after the balance of payments crisis in 1991, have been fundamental to India's accelerated growth performance. (A chronology of the broadly "pro-business" 1980 reforms and the broadly "pro-market" reforms of the 1990s is presented in Box 4.) [17]

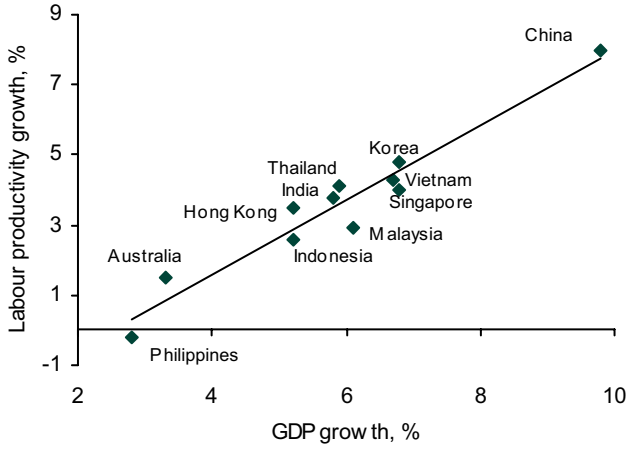
Accordingly, after first examining the (limited) information which can be conveyed by the basic macroeconomic data for output, employment and capital formation in conventional "growth accounting" analysis, this chapter proceeds to examine the role of economic reforms, particularly since the 1980s, and how they have fostered a dynamic interaction between rising consumption and rising (private) investment.

The growth of output

Calculations undertaken on a "peak-to-peak basis", so as to minimise distortions caused by short periods of unusually rapid (or slow) within-cycle growth, show that India's GDP growth has accelerated continually, from 3.9% per year on average over the period FY65 to FY71 to 6.8% over the period FY00 to FY07 (Figure 21). Similarly, time-varying estimates of trend growth calculated using a Hodrick-Prescott filter show GDP growth as having accelerated from 3.4% to 7.1% over the same period. Most recently, over the four years from FY04 to FY07, GDP growth has averaged 8.6% per year, India's fastest-ever growth over a four-year period. Over the past two years, GDP growth averaged even higher at 9.2%.

Notwithstanding this accelerating growth performance, however, India's growth has not been particularly spectacular in cross-country comparison. In large part, this reflects how slowly India was growing before the acceleration began. This suggests not only that India still has some way to go to catch up with other economies, but also that it is still in only the early stages of growth acceleration. In order to catch up, India's growth rate would have to increase above that of other Asian economies. We judge that this is achievable in the next stages of growth acceleration as India's growth increases and the other economies mature.

Figure 20. The "Verdoorn" relationship in Asia: average growth in GDP and labour productivity over 1980-2005



Source: World Bank and Lehman Brothers.

Figure 21. Historical review of India's average annual real GDP growth rate

Period	Interval	Peak-to-peak	Hodrick Prescott
1	FY51-FY57	4.0	4.1
2	FY57-FY65	4.4	3.7
3	FY65-FY71	3.9	3.4
4	FY71-FY79	3.8	3.5
5	FY79-FY91	4.9	4.8
6	FY91-FY00	5.8	6.0
7	FY00-FY07	6.8	7.1
Whole period	FY51-FY07	4.7	4.8
Recent period	FY04-FY07	8.6	7.4

Source: CEIC and Lehman Brothers.

[17] *Such a characterisation has been suggested by, for example, Rodrik and Subramanian (2004).*

Box 4: Summary chronology of India's reforms

Despite the common belief that India's reforms were initiated after the balance of payments crisis of 1991, the initial phase of reforms can be traced back to the 1980s. Panagariya (2004) judges that, while the 1980 reforms were substantial, they were half hearted, whereas the reforms initiated after 1990 were both systemic and deep.

Reforms during the 1980s: The real thrust to the reforms of the 1980s picked up in 1985 in the following key areas:

- **Import de-licensing**. (1) Imports of capital goods and intermediate inputs were liberalised by expanding the list of items under the open general license (OGL). (2) The share of canalised imports (monopoly rights of the government for the import of certain items) was reduced significantly, thereby providing more room for other imports.
- **Export incentives**. (3) Replenishment (REP) licenses were extended to exporters in 1985 to relax export constraints, and to provide a source of imports for goods sold in the domestic market. (4) Interest rates on export credit were reduced. (5) Foreign exchange for exporters was liberalised. (6) Profits from exports were made tax deductible.
- **Industrial controls relaxed.** (7) 25 industries were de-licensed in 1985. (8) The asset limit for firms which came under the Monopolies and Restrictive Trade Practices Act (MRTPA) was raised from INR200m to INR1bn in 1986, thereby enhancing product market competition. (9) Broad banding permitted firms in some industries to switch production between similar product lines. (10) A modified value-added (MODVAT) tax was introduced to replace multi-point excise duties. (11) Incentives that encouraged small-scale industries (SSI) to remain small, such as excise tax concessions, were gradually removed.
- **Administered prices de-controlled.** (12) Price and distribution controls on cement and aluminium were abolished.
- **Exchange rate.** (13) Rupee depreciation corrected the overvaluation of the currency, aiding external liberalisation.

Reforms since the 1990s: The government changed its approach to quantitative restrictions in the 1990s, from having a "positive list" to a "negative list". Key areas during this period were:

- **Deregulation of industry:** (1) With the New Industrial Policy 1991, the need for industrial licences was trimmed to only five industries. (2) Public sector monopoly was restricted to just eight sectors and the remainder were opened to the private sector. (3) A policy of automatic approval for FDI up to 51% was initiated for 34 industries.
- **External sector liberalisation:** (4) Import licensing on intermediate and capital goods was removed in July 1991, except for consumer goods which were exempted in 2001. (5) The rupee was devalued by 22% in 1991. (6) Peak import tariffs were lowered from 355% in 1991 to 10% in the FY08 budget. (7) The rupee was made convertible on the current account in 1994. (8) Capital account convertibility was introduced gradually, based on the recommendations of the Tarapore Committee, with greater liberalisation for companies and financial institutions.
- **Liberalisation of trade in services:** (9) The Insurance Regulatory and Development Authority (IRDA) bill was passed in 1999 and the insurance sector was opened up to the private sector, with 26% foreign investment allowed. (10) Private banks were allowed and 74% FDI was permitted under an automatic route in private banks; foreign banks were permitted to open several branches each year. (11) 100% FDI under automatic approval in infrastructure was allowed for construction and maintenance of roads, airports, highways, ports etc. (12) The Electricity Act 2003 was passed, to de-license generation and freely permit captive generation.
- **Financial liberalisation:** (13) Income recognition and asset classification under Basel norms were introduced in 1992. Banks are currently required to comply with the Basel II norms by 31 March 2009. (14) The National Stock Exchange was established in 1994, and lending rates of commercial banks were deregulated. (15) Foreign Institutional Investors (FIIs) were permitted to invest in government securities. (16) Fixed rate repos in government securities were introduced for liquidity management along with the Liquidity Adjustment Facility, Interest Rate Swaps (IRS), and Forward Rate Agreements (FRAs) as over-the-counter (OTC) derivatives. (17) Stock Index Futures were introduced in FY01 and the Clearing Corporation of India established to provide an integrated clearing and settlement system. (18) The statutory liquidity ratio (SLR) was cut from a peak of 38.5% to 25% in 1998, and interest rates on government securities were made more market-determined.
- **Fiscal consolidation:** (19) The RBI and the government agreed in 1997 to end automatic monetisation of fiscal deficits. (20) Under the Fiscal Responsibility and Budget Management Act (FRBM) Act 2003, the government is required to reduce the fiscal deficit by 0.3% of GDP, and the revenue deficit by 0.5%, every year, to eliminate the revenue deficit by FY09, and to bring the fiscal deficit down to 3% by FY09.

The growth of employment

Employment in India is measured only very imperfectly: the most serious problems are summarised in Appendix 2. One important study by Bosworth, Collins, and Virmani (2006) summarises the situation thus:

> "… reliable estimates of the total workforce are limited to the years covered by six quinquennial household surveys that were conducted over the period of FY73 to FY00. Annual estimates for the aggregate economy can only be obtained by interpolations of the results from those surveys"[18].

This seriously limits the usefulness for present purposes of India's employment data. Our best judgement is that total employment in India grew at 2.1% per year on average over the period FY73 to FY06. It grew slightly faster than this (2.3%) between FY73 and FY85, and slightly slower (2.0%) in the second sub-period, between FY85 and FY06. This largely reflects the stagnating employment growth in agriculture and the slack pace of employment growth in the manufacturing sector.[19]

We estimate that, encouragingly, total employment over the most recent period for which data are available grew faster, reflecting rising employment in services and, to a lesser extent, in manufacturing. For example, total non-agriculture employment grew 4.7% annually between FY00 and FY05, compared with an average rate of 2.8% during the preceding six years.

The growth of output per worker

Taking the employment estimates together with estimates for GDP growth suggests that output per worker in India accelerated progressively, from 3.3% per year on average between FY81 and FY92 to 4.2% between FY92 and FY06. We estimate that over the most recent period, FY03 to FY06, labour productivity grew by 5.4% (Figure 22).

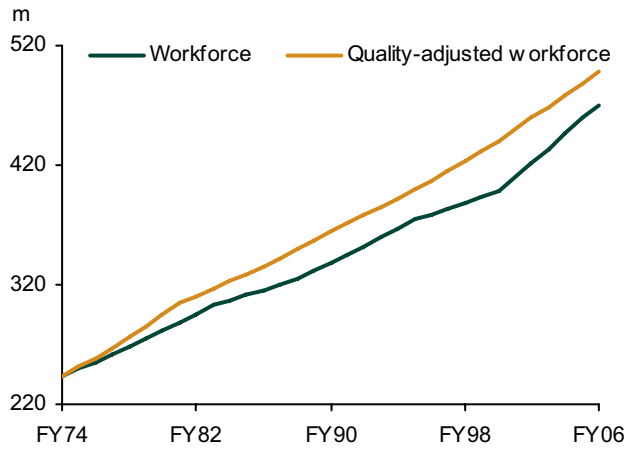
Meanwhile, the quality of India's organised labour has increased modestly, thanks to improved schooling and increasing returns to higher education. Adjusting the data to produce a "quality-adjusted" labour force (Figure 23), we estimate that "quality adjusted" labour input grew around 0.2pp faster each year than the unadjusted labour force growth of 2.1% (See *Box 5: Adjusting the labour force data for quality*).

Figure 22. Output per worker in India

	Period	Output	Labour	Output per worker
		Annual percentage rate of change		
Whole period	FY81 - FY06	5.9	2.0	3.8
Sub period I	FY81 - FY92	5.2	1.8	3.3
Sub period II	FY92 - FY06	6.4	2.1	4.2
Recent period	FY03 - FY06	8.3	2.7	5.4

Source: CEIC, NSSO and Lehman Brothers.

Figure 23. India's workforce – adjusted for quality



Source: CEIC, NSSO, World Bank and Lehman Brothers.

[18] *Bosworth, B., Collins, S.M. and Virmani, A. (2006), pp 13-14. They also go on to note that "A recent evaluation of the potential usefulness of the smaller NSO surveys, which were undertaken in other years, is provided by Sundaram, K. and Tendulkar, S.D. (2005). They concluded that the WPRs [worker-population ratios] are not sufficiently comparable with those of the quinquennial surveys. Bhalla and Das (2006) [no reference cited by Bosworth* et al.*] reach a contrary conclusion."*

[19] *Our figures are close to, though not in all cases identical to, those calculated by Bosworth, Collins, and Virmani (2006)*

Box 5: Adjusting the labour force data for "quality"

The quality-adjusted labour force grew 0.2% faster than the unadjusted labour force did.

It has been recognised at least since Adam Smith in the 18th century that two principal factors – the division of labour and education – do much to produce higher productivity and, thereby, earnings.[20] Smith argued that labour productivity is augmented by specialisation, including through the division of production into many different processes, as exemplified by his famous example of pin-making. The same phenomenon, writ large, can be seen in the specialisation of tasks in modern production processes where each individual worker concentrates on, and becomes highly efficient in, a strictly limited set of tasks which are performed repeatedly.

Regarding the productivity-increasing effects of education, a stream of post-1960s research analysing expenditure on education as investment across a wide range of countries and educational institutions has found rates of return similar to those from investment in physical assets.[21]

To the extent to which an individual's earnings in turn equate broadly to that individual's productivity – a possibly heroic assumption but an unavoidable one as few data are available on personal productivity – it may be reasonable to infer the extent to which expenditure on education may have raised the productivity of the labour force[22].

For India, Kingdom (1998) estimates the private return to a year's schooling to be around 10.6%. A similar study by level of education by Duraisamy (2002) has found the private returns per year of schooling in India in FY94 for the primary, middle, secondary, higher secondary and college levels of education to be 7.9%, 7.4%, 17.3%, 9.3% and 11.7% respectively (Figure 24). Interestingly, the returns to an additional year of women's education are apparently appreciably higher than those of men's at the middle, secondary and higher secondary levels.

Private rates of return to education at the secondary and tertiary levels are markedly higher in India than in most other countries at a similar development stage. This may reflect the fact that, although the standard of the best of India's education is high relative to the best in other countries, the average level of education is low by comparison. For example, the adult literacy rate in India is just 61%, compared with 91% in China. Worse still, India's female literacy rate is just 54.2%. Similarly, India's "average years of schooling" statistic is among the lowest in the group of countries shown in Figure 25. As in other countries, payoffs to higher education in India appear to be rising over time relative to the payoffs to lower levels of schooling, although the overall returns to college education do not appear to be as high as to lower secondary school education. (See Appendix 3 for details.)

On the basis of the data for average years of schooling and returns to education, we have adjusted India's employment data for estimated improvements in the "quality" of labour. These calculations suggest the "quality-adjusted" labour force grew about 0.2pp faster on average than the (2.1%) growth in the workforce over the period 1972-2004.[23]

Figure 24. Private rate of return to an extra year of education in India

%	Primary	Middle	Secondary	Higher secondary	College
Duraisamy (2002)	7.9	7.4	17.3	9.3	11.7
Tilak (1987)	7.8	8.5	negative	2.4	6.8
Pandit (1976)	17.3	18.8	5.0	5.2	9.2
Goel (1975)	10.4	10.1	6.0	-	6.4
Blaug et al (1969)	18.7	16.1	11.9	-	10.4
Nallagounden (1967)	23.0	13.0	10.0	-	8.1

Source: See references at the back of the report.

Figure 25. Cross-country comparison of education profile

	School life expectancy (years)	Adult literacy rate (% of people 15+)	Youth literacy rate (% aged 15-24)	Average years of schooling (over 15 yrs)
Year	**2004**	**2004**	**2004**	**2000**
Philippines	12	93	95	8
Thailand	13	93	98	7
China	11	91	99	6
India	**10**	**61**	**76**	**5**
Indonesia	12	90	99	5

Source: World Bank and Lehman Brothers.

[20] *Smith made these points in the first three chapters of* The Wealth of Nations*,*
[21] *The analysis of human capital was set on its modern course principally by Becker, G. (1964), and developed extensively by Mincer, J. (1974) and Kendrick, J.W. (1976).*
[22] *This line of empirical analysis was pioneered by Schultz, T. (1961) and Denison, E.F. (1962).*
[23] *Our calculation of the quality-adjusted labour force is based on the assumption of a 10% internal rate of return on education with average years of schooling taken from Barro and Lee (2000).Our results are a little lower than those obtained by Bosworth, Collins, and Virmani, (2006) – this is deduced from Bosworth* et al.*'s Table 3, which puts the contribution from quality at around ¼% per year. This figure had in turn been obtained by multiplying the quality adjustment by labour's share of GDP, which is around 0.6, and hence implies an "education adjustment" of (0.25/0.6 = 0.4).*

The growth of the capital stock

India's data on the resources devoted to capital formation are poor and subject to large revisions. According to Bosworth *et al* (2006):

> "The FY94 benchmark revisions increased total investment of all industries by a relatively modest 9 percent. Somewhat surprisingly, the changes associated with the shift to the FY00 base are much more substantial, despite the passage of just 5 years since the prior benchmark. Total industry fixed investment in FY00 has been increased by 33 percent, with revisions for agriculture, industry and services of 57, 17, and 46 percent respectively."

Taking the basic data at face value, gross investment has grown by an average of 6.9% per year since 1960 and at 8.9% per year since 1990. However, these investment figures are likely to under-represent the growth of the resulting productive capacity of the capital stock, probably considerably so. Perhaps the single most important reason for this is a failure to capture the phenomenon of economies of scale, whereby a given increase in all inputs taken together produces a proportionately greater rise in productive capacity.

From a qualitative perspective, economies of scale are particularly important in countries which are growing fast from a low base (by global standards). Opening up the economy allows firms to benefit from their comparative cost advantage and increase plant size. Furthermore, greater access to technology reduces the cost of capital, enhancing the productivity of investment – and, thereby, profits – encouraging capital accumulation.

Thus, a dynamic interaction develops between rising capital and labour productivity as higher capital productivity boosts the efficiency with which labour works with capital.

The results of growth-accounting studies on India

The "growth accounting" method fails to capture these vital dynamic features of "take-off": the typical finding is that much of the growth of output cannot be meaningfully accounted for by the weighted growth of inputs as measured. In the original application of this method, by Solow (1957) in his "Technical Change and the Aggregate Production Function", growth of the factors of production, labour and capital, accounted for just 12½% of US growth: the remainder of US output growth, some 87%, was attributed, rather emptily, to "technical change" – also dubbed "the 'residual", or "total factor productivity".

So it is with India. If the "growth accounting" method is taken at face value then, by our calculations, labour and capital, as measured, contributed just 23.7% and 27.1%, respectively, to total growth over the FY81 to FY06 period – i.e. the increase in factor inputs as measured accounted for only half of the growth in India's output (see Appendix 7 for details). Put the other way round, our calculations using this method suggest that the "residual" factor, or the growth of so-called "total factor productivity" (TFP) accounted for 2.9 percentage points per year, out of growth averaging 5.9%. These results are similar to those of other growth-accounting studies, which have found that TFP contributed a minimum of 34% (Bosworth *et al*) and a maximum of 48% (Dholakia) to total output growth (Figure 26).[24]

[24] *Bosworth, Collins, and Virmani (2006) find, for the period 1980-2004, that total factor contributed 2.0% points to the average GDP growth of 5.8%, a 34% share (2.0/5.8 = 0.34%).*

Figure 26. Sources of economic growth

	Period	Output growth	Contribution to growth, % points			Proportionate contribution to growth, %		
			Labour	Capital	TFP	Labour	Capital	TFP
Lehman Brothers								
Whole period	FY81 - FY06	5.9	1.4	1.6	2.9	23.5	26.6	49.9
Sub period I	FY81 - FY92	5.2	1.3	1.3	2.6	24.4	25.8	49.8
Sub period II	FY92 - FY06	6.4	1.5	1.7	3.2	22.9	27.1	50.0
Recent period	FY03 - FY06	8.3	1.9	2.2	4.2	23.1	26.7	50.3
Other studies								
Dholakia (2001)	FY86-FY01	6.0	1.8	1.3	2.9	29.7	21.7	47.9
Acharya *et al* (2003)	FY92-FY00	6.5	3.9		2.6	60.0		40.0
Bosworth & Collins (2003)	1980-1999	5.7	2.2	1.2	2.1	37.9	20.6	35.8
Virmani (2004)	FY81-FY04	5.8	-	-	2.4	-	-	41.4
Bosworth *et al* (2006)	FY81-FY05	5.8	1.9	1.4	2.0	32.8	24.1	34.5
Bosworth & Collins (2007)	1978-2004	5.4	2.0	1.3	1.6	37.0	24.1	29.6

Source: Lehman Brothers.

The limited usefulness of growth accounting

Despite the advantage of producing numbers which purport to apportion growth among main contributory factors, the growth accounting method is fraught with limitations. First, as discussed above, a large part of acceleration in output, over time and across countries, is attributed to essentially unexplained TFP. While this may highlight the quantitative importance of TFP, as defined, it does not *explain* what drives it. This is crucial when assessing growth in developing countries and, in India's case, in judging whether – or under what conditions – its recent rapid growth will be sustainable in the long term.

A second set of limitations relates to the assumption commonly made about the way inputs combine, i.e. about the production function (see Appendix 5). While the empirical evidence is overwhelming that economies of scale are widespread and large (see Appendix 4), growth accounting – largely for reasons of analytic convenience – typically assumes that economies are characterised by *constant* returns to scale. [25] (See Appendix 6 for more on this.)

Economies of scale

Economies of scale refer to the cost savings which a firm can achieve when rising production volume reduces its average unit cost, i.e. doubling inputs more than doubles output as factor inputs are used more efficiently. Economies of scope, on the other hand, refers to the cost savings which a firm can achieve by widening its product range such that its existing infrastructure or distribution network can be shared among products, reducing average unit costs.

Perhaps the most intuitive form of economies of scale is the physical size of production. The basis of many physical economies of scale lies in the laws of geometry and of physics. A geometrical example, which applies to many items of capital equipment, involves the so-called "power rule": where a piece of equipment is volumetric, e.g., a sphere, and the relationship between the area (A) of material used to construct it and the volume (V) which it encloses is expressed as:

$$A = fV^{2/3}$$

To the extent that cost is (approximately) proportional to the area of material used, cost varies as volume to the 2/3 power: a 10% increase in capacity requires only a 6.5% increase in expenditure on the material used in its construction. A similar phenomenon,

[25] *In their exhaustive survey of theories of economic growth, Hahn, F.H. and Matthews, R.C.O. (1964) observed that "…the reason for the neglect is no doubt the difficulty of fitting increasing returns into the prevailing framework of perfect competition and marginal productivity factor pricing."*

albeit with different parameters, applies to many other volumetric shapes, such as tubes and cylinders. Economies of scale are also to be found in some areas of agriculture, such as fencing: the cost is a *linear* function of the length of the fence, whereas the area enclosed increases with the *square* of the length of the fence.

The geometric origins of physical economies of scale are frequently modified significantly by the laws of physics. For example, a container cannot be scaled up without limit: the laws of physics governing the structural strength of a hollow body, such as a sphere, imply that, if scaled up too far, it would collapse under its own weight unless its walls were thickened, which would raise the cost of its construction. Hence, economies of scale in this case would ultimately be limited to less than implied by the 2/3 "power rule", although in many cases the volume would nevertheless increase less than in proportion with the amount, and hence cost, of the material used in its construction.

Geometric economies of scale are to be found in a wide range of capital items important to India's economy – ranging from blast furnaces to engines to ships – and they stand to be quantitatively important not only in the manufacturing sector, but also in a much wider range of economic activities, from food processing to transport to brewing.

However, there are many other ways of achieving economies of scale, including purchasing (bulk buying of materials through long-term contracts); managerial (increasing the specialisation of managers); financial (access to greater financing at lower cost) and marketing (spreading the cost of advertising over a wider range of output).

In the 19th century United States, for example, the combination of the newly developed railway and the telegraph increased substantially the size of the market available to many industries, for which access had hitherto been circumscribed by technological limits, making it difficult to exploit small local markets efficiently. Thus, industries as diverse as cigarettes, light machinery, electrical equipment, metal manufacturing, oil refining, rubber, glass, aluminium and steel all grew fast in the latter half of the century, giving rise to considerable economies of scale in the process.[26]

An example in India is Tata Steel, a fully integrated steel firm with strong backward and forward linkages. With the acquisition of NatSteel, Millennium Steel and – most recently – Corus, it has catapulted itself to the world's fifth largest producer from a rank of 56 before these deals. In addition to increased physical returns to scale, Tata Steel also benefits from bigger economic returns to scale arising from greater access to low-cost raw material, a larger customer base, global distribution networks and a full array of end-to-end steel products. (See *Box 6: Economies of scale: a case study of the Tata group*).

Accordingly, while constant-price perpetual-inventory capital stock series of the sort widely compiled by statisticians (in India as in most other economies) may measure reasonably accurately the (constant price) value of resources devoted to capital formation, they cannot be taken as even reasonably indicative of the rate of growth of the capacity afforded by that capital stock.[27]

[26] *Based on Chandler, A.D. (1990), as cited by Lipsey, R.G. (2000).*
[27] *In addition, there are serious theoretical reasons why such a measure of the capital stock cannot be used in a production function – and hence "growth accounting" – analysis.*

Box 6: Economies of scale: A case study of the Tata group

Global inroads via strategic tie-ups and the creation of upstream and downstream linkages are key to scale and scope economies.

Economies of scale refer to the cost savings which a firm can achieve when rising volume of production reduces its average unit cost. Economies of scope, on the other hand, refers to the cost savings which a firm can achieve by widening its product range in such a way that its existing infrastructure or distribution network can be shared among products, reducing average unit costs. Achieving economies of scale is one of the key drivers of consolidation. In India, a powerful example of a group which has taken advantage of economies of scale and scope is the Tata group and, within it, Tata Motors and Tata Steel.

Tata Motors was founded in 1945. Today, it is India's largest fully integrated automaker, with revenues of US$5.5bn in FY06. The company operates in commercial (CV), utility (UV) and passenger vehicle segments. Tata Steel was established in 1907. Today, it is the largest private-sector steel player in India, making long and flat products. Both companies have achieved economies of scale through a combination of consolidation, strategic tie-ups and cost reduction techniques.

Increasing domestic volumes

Volume is critical to scale economies. Tata Motors has garnered volume through reduced manufacturing costs. The company has pitched itself at the low-cost, spacious and fuel efficient car market. This has helped it to establish itself in both the personal and commercial car segment. The firm has tied up with Andhra Bank to leverage its wider branch networks and to finance sales in the rural and semi-urban markets. Tata Steel, on the other hand, has increased volumes by expanding greenfield capacity in the mine-rich states of Chattisgarh, Jharkhand and Orissa.

Making global inroads through strategic tie-ups

Tata Motors has followed the joint venture and acquisition route to increase its scale globally. It tied up with Rover Plc of the UK to help it market Indica. Tata Motors also has a strategic tie-up with Fiat in a joint venture, which gives it greater access to export markets because it can utilise the South American Fiat plants to manufacture and sell cars. The company has also managed to negotiate for superior quality components at competitive prices, even for the export markets, giving it scale economies. Furthermore, Tata Motors has used its strategic tie-ups to complement business and build supply chain. For instance, its joint venture with Cummins USA supplies Tata with Cummins engines, while the joint venture with HV Axles and HV Transmissions manufactures axles and gearboxes for its medium and heavy commercial vehicles.

Tata Steel initially focused on the domestic market but then exported its brands to Nepal, Sri Lanka and the Middle East before following the acquisition route. The firm acquired Millennium Steel (Thailand) in 2005; and the acquisition of NatSteel Singapore gave it access to NatSteel's assets in seven countries, as well as low-cost inputs. With the acquisition of Corus, the company has become a one-stop steel shop with large economies of scale. Tata Steel has access to Corus's customers and distribution network across geographies, reducing marketing costs and giving it large economies of scope.

Bringing economies into play through upstream and downstream linkages

Tata Motors uses a common platform for manufacturing its car brands Indica and Indigo. This helps the firm to shift between product lines, thereby increasing scale economies and efficiency. It has also created a large dealer network of around 140 outlets. The company has high levels of indigenisation, at 95%; and in-house has developed engines, gearboxes, body panels, castings and forgings, which helps it to save on import duties.

According to World Steel Dynamics, Tata Steel is the least-cost producer of steel globally – as it has both upstream and downstream linkages. The company has integrated operations right from iron ore mines (upstream linkage) to finished high-value-added steel products (downstream linkage), which it distributes from its 115 distribution centres, giving it large economies of scope. Its upstream and downstream integration plans include the development of a deep-sea port in Orissa.

Virtuous dynamics

Probably the most critical of all the limitations of the static growth accounting framework is that it fails to capture key dynamic interactions that evolve during an economy's growth acceleration. This is particularly the case for India.

One virtuous spiral has involved a synchronous rise in supply and demand. This is very different from the situation in the mid-1990s, when firms made large investments to boost capacity, anticipating a post-liberalisation driven domestic demand which failed to materialise. Domestic demand did not accelerate significantly and export growth remained lacklustre, leaving firms saddled with excess capacity.

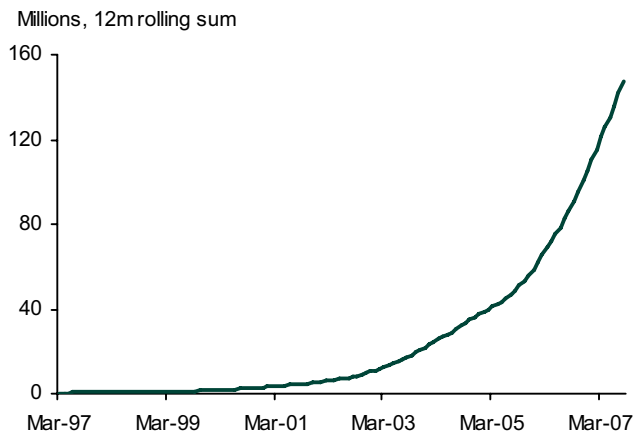
By contrast, during the recent acceleration, Indian demand growth – both domestic consumption and exports – has risen in line with that of supply. Demand has accelerated because personal annual income is reaching the critical threshold of around US$1,000 (or US$4,000 in purchasing power parity terms) at which demand for consumer durables and services – such as mobile phone – takes off (Figure 27). Supply, meanwhile, has been accelerating as a result of the opening of the economy. The rise in demand pushes capacity to its maximum and, crucially, imbues firms with the confidence to increase investment (Figure 28). Rising investment, in turn, raises the incomes of workers who can then buy the additional goods which the economy has the capacity to produce.

A second virtuous spiral relates to fiscal policy. Buoyant activity in India is boosting the government's coffers and lowering the general government fiscal deficit to a decade low (see Chapter 4: Macro management). This has two effects: first, it helps channel a greater share of government revenues into infrastructure spending, thereby boosting the productivity of private investments; and, second, it reduces the crowding-out of private investment that can come when higher deficits push up interest rates. Both factors have augmented the virtuous cycle of private investment growing with government expenditure.

A third dynamic interaction involves India's high growth, capital account liberalisation and relatively sound economic fundamentals, including high foreign exchange reserves, low external debt, small current account deficit and healthy financial and corporate sectors. This combination is attracting substantial capital inflows into the country, helping to finance investment and buoy asset markets. This is boosting consumption through wealth effects, and investment, giving rise to a virtuous spiral of growth leading to capital inflow and in turn to more growth.

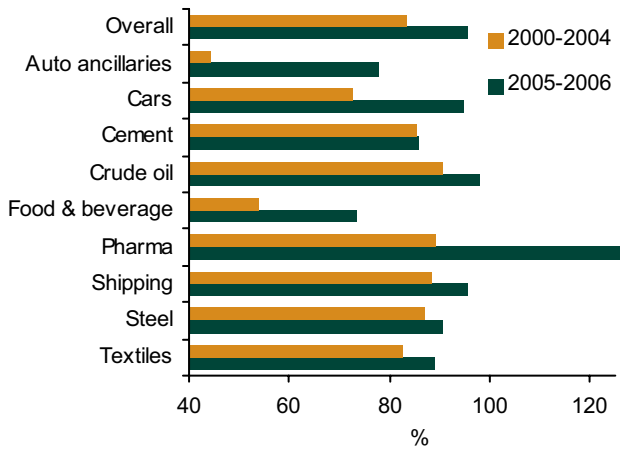
These virtuous dynamics are playing a fundamental role in India's take-off. And given that India's GDP per capita has risen to about US$1,000, that nearly 60% of its workforce is still in the countryside and that half of its population is under 25 years old, huge potential remains to be unlocked.

Figure 27. Rising mobile phone subscribers



Source: CEIC and Lehman Brothers.

Figure 28. Capacity utilisation rate across sectors



Source: CRIS INFAC, NCAER and Lehman Brothers.

Bottom line

Whether or not this "unlocking" occurs, however, will depend on further supply-side reform, a consideration of the contribution of which forms the subject of the next chapter. We also look at the unfinished reforms in the critical areas of financial sector development, macro management, foreign trade and investment liberalisation, hard and soft infrastructure building, and market competition. Success in implementing reforms requires that politics do not get in the way. Accordingly, the chapter also considers the political challenge which implementation of these policies may imply.

CHAPTER 4: INDIA'S RECENT GROWTH ACCELERATION – THE CRUCIAL ROLE OF REFORMS

Introduction

This chapter discusses India's policies, reforms and politics, highlighting the key areas which India must focus on to stay on its new, higher growth trajectory with the potential to raise it further.

We focus on five main areas:

- Developing the financial sector
- Macro management
- Foreign trade and investment
- Economies of scale and competition
- Growth and governance – the political challenge

DEVELOPING THE FINANCIAL SECTOR

On our estimates, development of the financial sector could add 1.0-1.5 percentage points to long-term GDP growth.

A solid and well-functioning financial sector is a powerful engine of economic growth, channelling savings to the most productive investments. A positive relationship between financial development and growth has long been recognised in the economic literature (Schumpeter, 1912). However, while early empirical work established that financial development and economic growth occurred in tandem, there was no strong evidence of a causal relationship (Robinson, 1952).

But in recent decades a consensus has been emerging from more sophisticated empirical studies at the cross-country, industry and firm levels that financial development is an important contributor to economic growth (Levine and Zervos, 1998; Rajan and Zingales, 1998; Levine, 1999; Khan and Senhadji, 2000; Tsuru, 2000; Bassanini, Scarpetta and Hemmings, 2001; and Favara, 2003). Such studies demonstrate that financial development can spur economic growth through various channels including by:

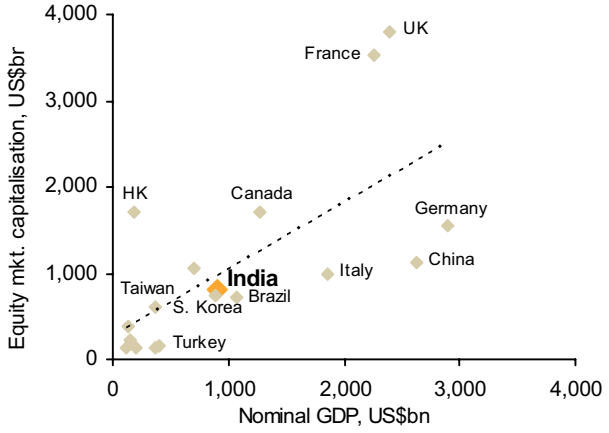
- Increasing the efficiency whereby savings are mobilised – through increased consumer access to finance – and allocated to the most productive investments, thereby increasing the productivity of capital;

Figure 29. The size of the financial sector in 2006

	India		Asia ex-Japan	
	US$bn	% GDP	US$bn	% GDP
Equity market capitalisation	802	88	5,976	118
Private loans outstanding	417	46	5,687	113
Domestic bonds outstanding	326	36	3,307	66
- Public	305	34	1,983	39
- Private	21	2	1,324	26
Total financial assets	1,545	170	14,970	297

Source: Bank for International Settlements, IMF, World Bank, ADB, World Federation of Exchanges members, CEIC, and Lehman Brothers.

Figure 30. Equity market capitalisation in 2006



Source: World Bank, World Federation of Exchanges members, CEIC, and Lehman Brothers.

- Reducing the cost of raising debt and equity capital;
- Encouraging new business start-ups and innovation, and helping consumers to smooth their consumption over their lifetime;
- Facilitating the trading, hedging, diversifying and pooling of financial risk, thereby reducing uncertainty;
- Reducing the risk of financial crises, especially important in the presence of large and potentially volatile capital flows; and
- Enhancing the efficiency of monetary policy by increasing the number of channels – and the speed – whereby changes in interest rates affect the economy.

The gaps

India has made substantial reforms to its financial sector since 1991 – including deregulating interest rates, liberalising capital inflows and strengthening the regulatory bodies – and the economy is reaping the benefits. We estimate that the total size of India's financial sector increased from US$0.3tr in 1994 to US$1.6tr in 2006 (Figure 29).

The biggest success by far has been its equity market, which in fact is one of the oldest in the world – the Bombay Stock exchange was founded in 1875. India's equity market capitalisation was 88% of GDP in 2006, which is high relative to other countries at a similar stage of economic development (Figure 30). India's main stock exchanges boast world-class electronic trading and settlement systems, with trades settled in just two working days. India's National Stock Exchange is now the world's third largest, after NASDAQ and NYSE, in terms of the number of transactions per year.

Nevertheless, strip out India's vibrant equity market and large government bond market and the financial sector looks much smaller. Large gaps remain, most notably perhaps the virtual absence of a corporate bond market.

Further broadening and deepening of the financial sector offers enormous potential for India to develop into a main financial hub in Asia. After all, India already has many of the preconditions: domestic savings are rising; the pension and insurance systems have yet to be developed; the capital account is now largely convertible; it is at the cutting edge of software technology and English is widely spoken in the major cities.

To build on this platform, we see the following three core reforms as top priorities:

Government crowding out banks. The banks have to finance the government's large budget deficits, which have thereby been "crowding out" the availability of funds lendable to the private sector. Banks are currently obliged to maintain a minimum Statutory Liquidity Ratio (SLR) of 25%, i.e., 25% of total bank deposits must be invested in government debt and other approved securities. Until recently, banks have held government securities well in excess of the SLR requirement, helping to explain why private loans outstanding comprise about 45% of GDP, which is a very low ratio by international standards (Figure 31).

Substantial segments of India's economy, notably SMEs and rural households, remain largely excluded from access to formal finance (see *Box 7: Microfinance – a serious business, not charity*).[28] Moreover, banks tend to have short-term liabilities – with the result that buying long-term government bonds exposes them to interest rate risk when, in most other countries, banks typically specialise in credit risk.

[28] *To compensate for the lack of finance in rural areas there have been some innovative microfinance approaches. However, the reach of microfinance institutions has been modest and is an unlikely substitute for an efficient formal financial sector (see Box 7: Microfinance – "A Serious Business, Not Charity").*

Box 7: Microfinance – "A Serious Business, Not Charity"

Microfinance in India is attracting the interest of major financial institutions but has yet to diversify beyond simple loans.

Microfinance is the practice of providing financial services, such as microcredit, microsavings or microinsurance to poor people. In the current decade India's microfinance industry has taken off, comparable to the economy's overall growth story, to the point where – according to Dr Vikram Akula, CEO of Hyderabad-based SKS Microfinance and winner of several awards for his work in this field – the total market for microfinance in India now stands at around US$2bn.

Dr Akula underlines that the rapid expansion of the microfinance sector is a reflection of the fact that: "People are dying for an opportunity; they don't want hand-outs – they don't mind paying interest; they just want to get on with running businesses". Above all, he believes, they are "hungry" for – and, if they have the means, are willing to pay for – two services in particular: private education for their children and healthcare.

According to Amy Yee in one of a series of articles on microfinance published in *The Financial Times* last year, SKS alone has disbursed more than US$92m since its launch in 1998 and has a 98% on-time repayment rate from a total client base which is now around 700,000, based in nearly half of India's states (see "Farmers' Small Loans Cultivate Knowledge", *The Financial Times*, 10 November 2006). Around 70% of India's population still lacks a bank account and returns on equity (ROE) in the microfinance industry are around 23% (despite interest rates which significantly undercut those charged by traditional money lenders). It is hardly surprising therefore that, to quote from Ms Yee's 15 November 2006 article (from which this box borrows its title): "Large banks are increasingly viewing microfinance as serious business rather than altruistic works and are providing loan capital to groups such as SKS. And now venture capital firms are taking equity stakes in microfinance groups to take them to the next level."

In a third article Ms Yee notes the two "core models" of microfinance to be found in India. In the "self-help group (SHG)" model which has grown almost tenfold in the past five years and which now applies to over 31m families, "…groups of about a dozen women in a village pool their savings. After several months of managing and disbursing their money, they are eligible for a bank loan of up to four times that amount." In the second model, "…banks loan money through multi-finance institutions, usually non-governmental organisations with a track record for rural development work." Ms Yee adds that there are now about 800 such institutions with an estimated loan portfolio of US$347m.

Despite the boost of the past decade or so, scope for further growth of the sector is huge. Reflecting the concentration of micro-financiers in the south of the country – in particular Andhra Pradesh, Karnataka and Tamil Nadu – independent experts estimate that microfinance services are still only available to around 20% of India's 75m households living around the poverty line. Furthermore, many loans still amount to "subsistence credit" (the average loan size is just US$90), rather than bigger "enterprise credit" to help lenders start income-generating businesses capable of lifting them out of poverty. The World Bank (see Basu and Srivastava, 2005) suggests that for the SHG bank linkage to be scaled-up further requires "promotion of high quality SHGs that are sustainable, clear targeting of clients and ensuring that banks linked to SHGs price loans at cost-covering levels."

Although the industry appears to have worked well to date, growth of the sector also begs questions over regulation (for which there is currently no responsible agency). A report commissioned last year by the Swiss Agency for Development and Cooperation (SDC), the international NGO CARE and the Ford Foundation called for greater transparency, more training for local partners and diversification of services (e.g., into pensions and insurance). It remains to be seen whether this will take the form of an industry-generated code of conduct or whether the government will bring in formal regulation.

One way or the other microfinance in India looks set to continue to grow and, increasingly, to attract business-based investment from major financial institutions. Nevertheless, although the author of last year's report, development consultant Dr Prabhu Ghate, pronounced himself "reasonably confident that [microfinance] will… make a dent on financial inclusion in the next 10 years", the extent to which it can provide the diverse range of services which Indians will increasingly seek as they emerge from poverty remains to be seen. y

In recent years, loan growth has been strong as banks have drawn down their excess holdings of government securities to the point where they are now close to the minimum SLR requirement. To promote bank lending the SLR should, in our judgement, be gradually phased out or at least reduced substantially, which will be easier if the government continues to make good progress in reducing its budget deficit.

Underdeveloped corporate bond market. By international standards Ь and also in relation to its stage of financial development Ь India's private bond market is immature, with debt outstanding equal to just 2-3% of GDP (Figure 32). A diverse domestic pool of institutional investors has yet to emerge, and there are tight controls on portfolio allocation. Public offerings are costly, time consuming, and involve many disclosure requirements. There is virtually no market for corporate bonds below investment grade.

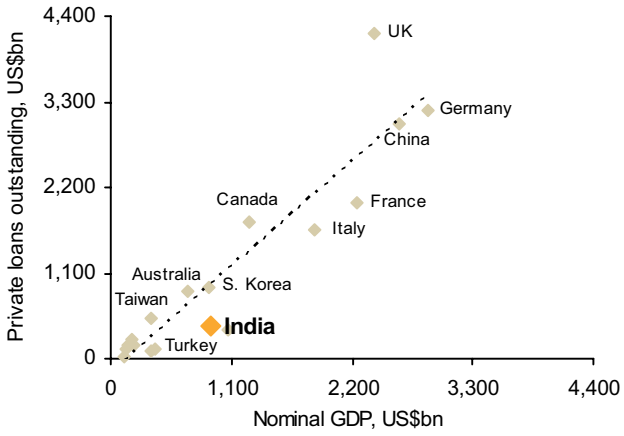
To sustain India's nascent boom in business investment, a deep and liquid corporate bond market is urgently needed to fill the gap left by the declining role of development financial institutions, long the traditional source of long-term finance for Indian companies. Banks are reluctant to fill this vacuum, however, because of the asset-liability mismatch which it creates on their balance sheets, it being the case that Indian companies issue debt securities of much longer maturities than the average bank deposit: instead Indian banks are turning their attention to retail lending.

Without a developed corporate bond market India's financial sector risks becoming unbalanced, given that equity and debt markets play different roles. India's corporate sector needs a healthy debt-equity mix. Firms issue debt more readily when investors demand a relatively safe instrument with a strong commitment to pay out. A firm issues equity when investors have an appetite for risk, expect high growth and want a share in the expected growth potential. The corporate bond market can provide a stable source of finance when investors perceive risk to be high and the equity markets are volatile. Without a well developed bond market, companies have to roll over short-term debt and increase their borrowings overseas, exposing themselves both to refinancing and to exchange rate risks.

Dominance of public sector banks. The public sector still dominates India's banking industry, accounting for 75% of the assets. Yet, there is strong international evidence that such dominance retards financial development and growth (Hauner, 2006; and Barth, Caprio and Levine, 2000).

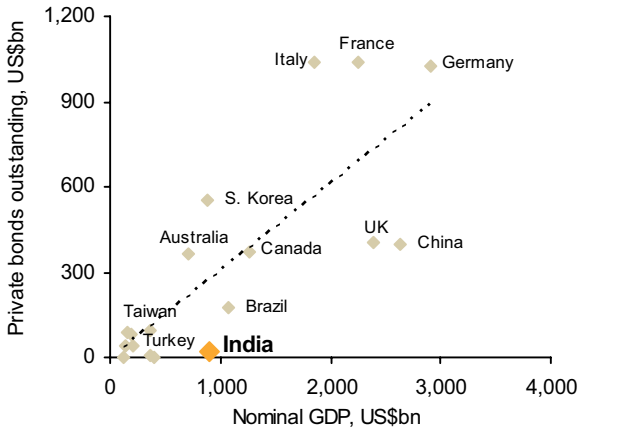
Public sector banks tend to be less motivated by profit maximisation than are their private counterparts, being prone to political influence and moral hazard problems. The margin between lending and deposit rates for India's state-owned banks is 6.3%, compared with an average of 3.1% in Korea, Malaysia, Singapore and the United States

Figure 31. Private loans outstanding in 2006



Source: IMF, World Bank, CEIC, and Lehman Brothers.

Figure 32. Private domestic bonds outstanding in 2006



Source: Bank for International Settlements, World Bank, ADB, CEIC, and Lehman Brothers.

(Farrell and others, 2006). Only ten of the 27 publicly owned banks were fully computerised by March 2006. The average age of employees in Indian public sector banks is 45 years plus compared to about 25 for the overall population (Mohan, 2007).

Capital is what Indian banks need to meet the stricter Basel II norms in FY09. In this context, reducing the government's stake to less than 51% in public sector banks will go a long way to reducing the capital deficiency and preparing for the competitive pressures likely to build from the entry of foreign banks in 2009.

The way forward

There is a broad agreement in India on what needs to be done to develop the financial sector further. The government-appointed Patil Committee has submitted clear recommendations on how to develop the corporate bond market, while the central bank-appointed Tarapore Committee has unveiled an equally clear road map for fuller capital account convertibility (see Boxes 8 and 9). The proposals aim at enhancing liquidity in the corporate bond market and encouraging greater two-way movement of capital, respectively. Implementation, however, is complicated because many of the reforms are interdependent and therefore require careful sequencing. For example:

- For banks to focus less on financing public debt and more on their lending to the private sector, the government must maintain a prudent fiscal policy;
- To increase competition and strengthen the banking sector, a large number of public sector banks need to be privatised; To develop the corporate bond market, priority must attach to attracting institutional investors which requires developing the insurance and pension systems, promoting mutual funds and further relaxing restrictions on foreign institutional investors; and
- To liberalise the capital account further, the economy needs an efficient financial sector, strong regulatory and supervisory bodies, fiscal discipline, sound monetary policy and a not-too-large current account deficit.

Huge potential

If India's financial sector is developed further, the momentum could become self-sustaining. International experience has been that, once financial sectors take off, they tend to grow much faster than nominal GDP. This is partly because, as financial sectors develop, they tend to attract greater investment, which spurs economies of scale and product innovation to manage risk. This leads to new markets, such as derivative products, commodity market exchanges, credit default swaps and debt securitisation, all of which help attract even greater investment.

We see little reason why the success of India's equity market cannot be replicated in its corporate bond market. India already has many of the necessary preconditions for developing a corporate bond market including: large private companies; experienced credit rating agencies; market-determined interest rates; a benchmark government yield curve; and a sound regulatory framework. Moreover, the macro preconditions seem ripe for a "big bang" in India's financial sector development, if the recommendations made by the Patil and Tarapore committees are implemented. India's capital account has already been significantly liberalised – more so than many other countries at a similar stage of economic development; and, with robust economic growth, India is attracting substantial foreign investment, judging from its foreign exchange reserves, which have more than quadrupled since 2001 to US$236bn in mid September 2007. Domestically, fiscal consolidation is making headway – the general government deficit-to-GDP ratio is at its lowest in a decade – which is increasing government savings.

Box 8: Recommendations on capital account convertibility

The second Tarapore Committee (TC) was formed in March 2006 (the first presented its recommendations in May 1997) to explore fuller capital account convertibility. Its recommendations were unveiled in July 2006 in the form of a roadmap over a five-year period, up until FY11. A summary follows:

Current status: The 2006 TC described the situation as follows: "…for foreign corporates and foreign institutions, there is a reasonable amount of convertibility; for non-resident Indians (NRIs) there is approximately an equal amount of convertibility, but one accompanied by severe procedural and regulatory impediments. For non-resident individuals, other than NRIs, there is near-zero convertibility…as regards residents, the capital restrictions are clearly more stringent than for non-residents. Furthermore resident corporates face a relatively more liberal regime than resident individuals. Until recently, resident individuals faced a virtual ban on capital outflow, but small relaxation has been undertaken in the recent period."

Preconditions and sequencing: The TC-recommended preconditions for capital account liberalisation include: a central fiscal deficit of 3% of GDP or less (currently 3.5%); inflation within 3-5% (currently 3.4%); a current account deficit no higher than 3% of GDP (currently -1.1%); a net non-performing asset ratio of 5% or less (currently 1.1%); FX reserves sufficient to cover six months of imports (currently 13 months); avoiding a prolonged overvalued exchange rate, by having a monitoring band of +/-5% around the neutral (not defined) real effective exchange rate; strengthening the banks and legal system; having well developed capital markets; and avoiding high levels of debt, especially of short-term maturity.

Recommendations

Residents (companies): The current limit of US$22bn for external commercial borrowings (ECB) should be gradually raised (ECBs of over seven year maturity should have no ceiling from FY08-FY09); (note: subsequent to this recommendation, the Finance Ministry on 7 August 2007, restricted that ECB of over US$20m will be permitted only for foreign currency expenditure, while ECBs under US$20m can be used for rupee expenditure, but only after the RBI's approval.) The limit per corporate for automatic approval (currently US$500m per year or US$750m, if average maturity is more than ten years) should be raised to US$1bn in FY10-FY11. If ECB is denominated in rupees (and payable in foreign currency) it should be excluded from the limits. Limits for investment abroad should be raised from the existing 300% of net worth to 400% in FY10-FY11 (note: the RBI raised this limit to 400% of net worth on 25 September 2007, well ahead of schedule).

Residents (financial institutions): The current limit for bank borrowing from overseas banks is 50% of unimpaired Tier 1 capital, or US$10m, but should be raised to 75% in FY08-FY09 and 100% in FY10-FY11. For mutual funds, the current overall limit for overseas investments is US$4bn, with individual ceilings decided by SEBI (usually 10% of net asset value, or US$50m). The limit should be raised to US$5bn in FY10-FY11, and individual limits should be removed. (note: the limit for mutual funds was raised to US$5bn in September 2007 and the individual limit set by the SEBI was raised to US$300m).

Residents (individuals): The current limit of US$100,000 per person per year for overseas financial transfers should be raised to US$200,000 in FY10-FY11. (note: limit was raised to US$200,000 on 25 September 2007, ahead of schedule.)

Non-residents (companies): FDI is permitted in most sectors but with limits in some such as finance, broadcasting, infrastructure and retail trade (for details, see Appendix 9). Regulations and procedures for FDI should be streamlined and liberalised. New participatory notes should be banned and existing P-notes should be phased out. Companies should be allowed to invest in the Indian equity market through mutual funds and portfolio management schemes. Raising funds in India by issuing rupee-denominated bonds should be broadened to corporates and financial institutions, subject to an overall ceiling which can gradually be raised.

Non-residents (financial institutions): Portfolio investment is permitted to entities registered as foreign institutional investors (FIIs), subject to a ceiling of 10% for each FII. For investment in debt instruments, FIIs are currently subject to a ceiling of US$3.2bn for government debt; this should be changed to a limit of 6% of total gross issuance per year in FY07, 8% in FY08-FY09 and 10% in FY10-FY11. FIIs are currently subject to a ceiling of US$1.5bn for corporate debt; this should be changed to a limit of 15% of fresh issuance per year in FY08-FY09 and 25% in FY10-FY11.

Non-residents (individuals): NRIs are currently permitted rupee and foreign currency special bank deposit facilities with tax benefits. Non-residents other than Indians should also have access to these deposit facilities but with no tax advantages. Currently, NRIs can invest in individual companies on the stock market up to 5% of the paid-up value of the company or the value of the convertible debenture, with an aggregate ceiling for NRI investments of 10%. Non-residents other than Indians should also be allowed to invest in the stock market through mutual funds and portfolio management schemes, with the funds channelled through bank accounts in India.

Box 9: Recommendations on developing the corporate bond market

In July 2005, the government set up a high level committee, under the chairmanship of Dr R.H. Patil, to make recommendations on how to develop the corporate bond market. The committee submitted its key recommendations to the government in December 2005:

Enhancing the investor base

- Restrictions should be relaxed on the scope of investments in rated corporate bonds by banks, foreign institutional investors, pension, provident and gratuity funds and insurance companies.
- The investment ceiling on foreign institutional investors should be raised.
- Retail investors should be encouraged to participate in the market through stock exchanges and mutual funds.

Enhancing the issuer base

- Stamp duty on partly secured and unsecured debentures should be made uniform across all states and should be linked to the tenure of the securities, with an overall cap (note: subsequent to this recommendation the state finance secretaries have agreed to a common stamp duty, currently proposed at 0.25%).
- The tax-deduction-at-source rules for corporate bonds should be similar to those applicable to government securities.
- The time and cost of public issuance and the disclosure and listing requirements for private placements should be reduced and simplified.
- Banks should be allowed to issue bonds of maturities of over five years for asset-liability management purposes Þ and not only for the infrastructure sector as at present.
- The government could underwrite some of the tranches to enhance the credit rating, particularly for infrastructure bonds.

Creating a more efficient primary market

- For listed companies, disclosure requirements should be substantially abridged so that incremental disclosures are needed only when they approach the market for a fresh issue, either to the public or through private placement.
- For unlisted companies issuing bonds to institutional investors, the disclosure requirements should be stringent, including credit ratings.
- The Securities and Exchange Board of India (SEBI) should encourage the growth and development of professional trustee companies.
- Debenture trustees should ensure that information on credit rating downgrades is made available to all investors. A press release should be made public whenever there is a default by a corporate.
- SEBI should issue guidelines providing wide dissemination of information to help create an efficient market. A centralised database needs to be created for all bonds issued by companies. All information, including compliance reports, should be made public and put on the websites of the companies, debenture trustees and stock exchanges.
- It should be made mandatory for the issuer to have the privately placed bonds listed within seven days of the date of allotment, similar to the norms applicable to public issues.

Creating a more efficient secondary market

- Efficient market-making needs to be encouraged, for example by allowing repos in corporate bonds.
- A trading reporting system needs to be developed to capture all information related to trading corporate bonds as accurately and as close to execution as possible; and to facilitate clearing and settlement and price discovery (note: subsequent to this recommendation, corporate debt transactions have started to be reported on the stock exchanges)
- Banks and other institutions should be given the freedom to set up inter-dealer electronic broking platforms to facilitate over-the-counter deals.
- Steps should be taken to introduce the revised and approved exchange-traded interest rate derivative products, which have long been pending (note: currently, the interest rate derivatives market is confined to the over-the-counter market, with only a handful of participants).
- The minimum market lot criteria of INR1m (about US$25,000) for trading in corporate bonds at the stock exchanges should be reduced to INR100,000 (about US$2,500) to enable better access for smaller investors.ý

The area which remains largely untapped – and hence offers the most potential, in our view – is private savings. Economic theory on the "demographic dividend" associated with the transition from high to low fertility and mortality rates highlights the large pool of potentially employable labour of working age and the potential for high saving rates by these workers, particularly as they move into their most productive years and as the need to support their young dependents lessens (Bloom and Canning, 2004).

Empirically, there is strong evidence of a demographic dividend effect on savings. In Japan, Korea and China the decline in dependency ratios – the sum of people aged 0-14 and over 65 divided by those aged 15-64 – has correlated strongly with a rise in the (gross) saving-to-GDP ratio (Figure 33).

A similar relationship obtains in India; and, with half its population still under 25 (and 40% under the age of 18), India's dependency ratio is projected to fall from 60 now to 48 by 2025. This could potentially lift India's gross domestic saving ratio from an estimated 34% in FY07 to over 40% by 2025, provided the young workforce is well trained and healthy (Figure 34).

Developing India's pension and insurance systems will be key to mobilising household savings. And here, too, there is enormous potential, given that 80% of India's 1.1bn population has no insurance coverage and that 88% of the workforce does not contribute to pension schemes.

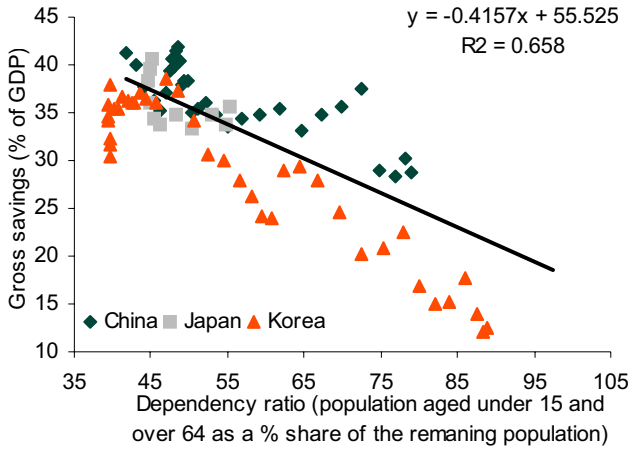
Lehman Brothers' projections

Combining India's private loans outstanding, equity market capitalisation and domestic bonds outstanding, we estimate that the total size of the financial sector has grown from US$0.3tr (83% of GDP) in 1994 to US$1.6tr (170% of GDP) in 2006. While that is undoubtedly impressive, by international standards India's financial sector remains under-developed relative to the size of its economy (Figure 35).

If India sustained its recent pace of economic growth, as we believe it could, the economy would approximately double in size by 2012 to about US$2tr. In turn – assuming (conservatively, in our view), a constant ratio of financial sector to GDP – India's financial sector could grow to US$3.4tr.

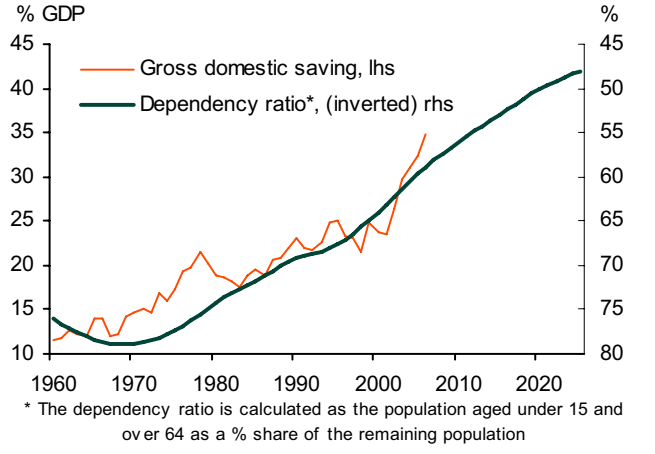
Moreover, we regard this as a lower-bound, conservative estimate. If India presses ahead with financial reforms – such as privatising the banks, developing the corporate bond market and further liberalising the capital account – its financial asset-to-GDP ratio

Figure 33. Domestic savings against falling dependency ratios in China, Korea and Japan during 1960-2006



Source: US Census Bureau, World Bank, CEIC, and Lehman Brothers.

Figure 34. India's domestic savings and dependency ratio



Source: United Nations, World Bank, CEIC, and Lehman Brothers.

should be able to rise to at least the "line of best fit" in Figure 35: and that would put the size of India's financial sector by 2012 at 343% of GDP, or US$6.9tr in today's prices.[29]

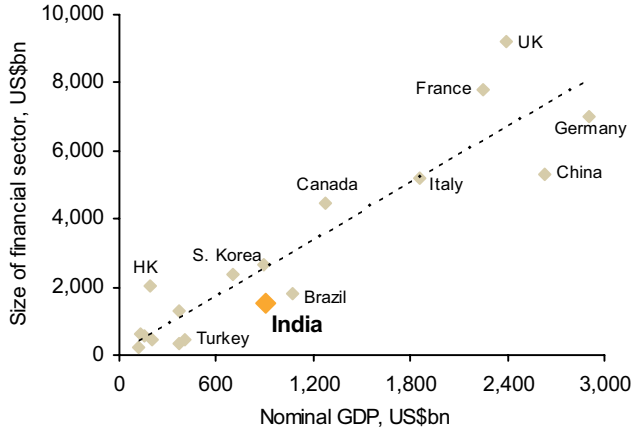
It is no easy task to estimate the economic benefits which flow from India's rapidly growing financial sector. The banking and insurance sectors have certainly been growing faster than the overall economy; but this is a very narrow measure of the financial sector and it gauges only the direct effects (Figure 36). An alternative approach is to estimate empirically the relationship between GDP growth and financial development. We have undertaken this using panel data for the period 1995-2006 for the twenty countries depicted in Figure 34 (see *Box 10: Estimating the impact of financial development on economic growth*).

Our results, while encouraging, should be treated cautiously. After all, GDP growth is the most endogenous of economic variables and there is also likely some reverse causality from GDP growth to financial sector development. That said, the coefficient on the financial asset-to-GDP variable is positively signed and statistically significant under the three different methods, with values ranging from 0.0058 to 0.0086. These results suggest, broadly, that each one-percentage-point (pp) increase in the financial asset-to-GDP stands to boosts long-run GDP growth by 0.006-0.009pp.

For India, this implies that, if it can raise its financial asset-to-GDP ratio by 173 percentage points (343-170) to the line of best fit, it could raise its long-run GDP growth by 1.0-1.5pp.

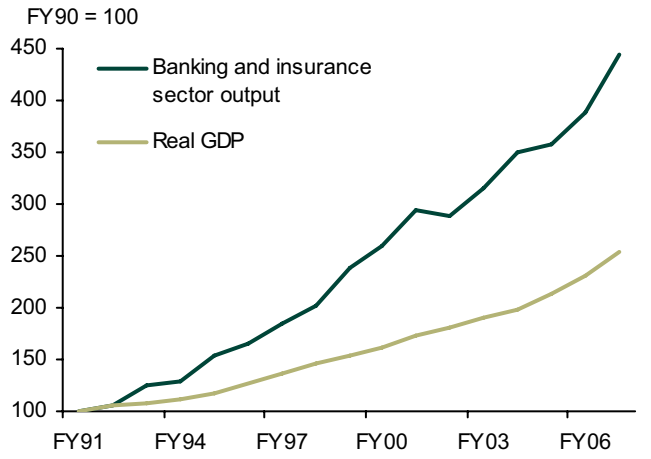
However, we believe India has enormous potential to lift its financial asset-to-GDP ratio above the line of best fit and get an even bigger GDP growth bang out of the financial development buck. To achieve this, Mumbai needs to be developed into one of the world's financial hubs. This will require India taking further steps to leverage its considerable comparative advantages, including: the scope to attract considerable talent from and/or deepen interaction with its diaspora in financial institutions worldwide; English-language skills; and "hard" infrastructure development and the ability to draw on India's world-class ICT-industry on which the finance industry depends heavily to disseminate information speedily.

Figure 35. The size of financial sectors in 2006



Source: Bank for International Settlements, IMF, World Bank, ADB, World Federation of Exchanges members, CEIC, and Lehman Brothers.

Figure 36. India's GDP: total and financial sector output



Source: CEIC and Lehman Brothers.

[29] *Note: for this calculation we included the data points for Japan and the US, which are not included in Figure 35, simply because the size of their financial sectors, at US$20.1tr and US$49.5tr, are off the chart.*

Box 10: Estimating the impact of financial development on economic growth

A substantial body of empirical work has tested the relationship between financial development and economic growth (a good survey of the literature is provided in Khan and Senhadji, 2000). The studies are generally based on regression analysis for a large cross-section of countries.

The basic equation we have investigated has the following form:

$$Y_i = \alpha + \beta FD_i + \delta X_i + e_i$$

Where:

Y_i is the rate of real GDP growth of country I;
FD is an indicator of financial depth;
X is a set of control variables;
e is the error term.

We ran a simple regression of real GDP growth against total financial assets (measured as the sum of loans outstanding, government and corporate bonds and equity market capitalisation) as a share of GDP, using panel data for the 20 countries highlighted in Figure 34. The regression was estimated for 1995-2006 (making for 240 annual observations). We expanded on this in three ways. First, we added GDP per capita as an explanatory variable to "control" for the different stages of economic development of each country. Second, we added dummy variables for each country to isolate country-specific shocks (e.g. political instability). Third, we added individual year dummies to isolate year-specific developments (e.g. the 11 September 2001 terrorist attack). In all three methods, the coefficient on the financial asset-to-GDP variable is "correctly" signed (i.e. positive), with a t-value which is statistically significant at the 5% probability level. The ordinary least squares regressions were run using White-consistent standard errors and covariance to correct for heteroskedasticity, a common problem associated with panel data.

Our results in Figure 37 are consistent with most of the empirical evidence, which finds a strong and statistically significant relationship between financial development and economic growth. That said, it can be argued that the relationship reflects reverse causality – i.e. that faster economic growth leads to financial development. While this argument carries some weight, the large body of empirical evidence – including some studies which have taken a more microeconomic approach (e.g., Rajan and Zingales, 1996) – cannot be dismissed on the basis of this premise alone. Indeed, it would amount to assuming not only that growth affects financial development, which is realistic, but also that financial development has no effect on growth, which is counterintuitive. y

Figure 37. Estimating the relationship between the ratio of financial assets to GDP and GDP growth

	Regression 1		Regression 2: country dummies		Regression 3: country and year dummies	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	4.34	8.6	5.69	9.8	6.77	8.0
Financial assets/GDP	0.0058	3.2	0.0086	2.5	0.0075	2.4
GDP per capita	-0.0002	-6.0	0.00002	0.4	-0.0001	-2.7
R-squared	0.12		0.31		0.55	
SE of regression	3.29		3.02		2.52	
Durbin-Watson statistic	1.53		1.50		2.25	

Source: Lehman Brothers.

MACRO MANAGEMENT

Macro-economic policies have improved; but a new challenge is the management of huge capital inflows.

Prudent macro policies and sound institutions are key ingredients to sustaining strong economic growth. The literature has tended to focus on the following relationships:

Lax monetary policy leads to high inflation, which is negative for growth. It can increase distortions created by non-indexed features of the tax system (Feldstein, 1996); and it is typically correlated with higher variability in inflation, which generates uncertainty, thereby hindering investment (Ball and Cecchetti, 1990). A study of OECD countries estimated that a reduction by 1 percentage point (pp) in the standard deviation in inflation could lead to an increase in long-run output per capita by 2pp, *ceteris paribus* (Bassanini and Scarpetta, 2001). High inflation also creates so-called "menu costs" whereby sellers have to spend more time and resources revising their prices; and it can reduce the credibility of monetary policy, raising long-run inflation expectations.

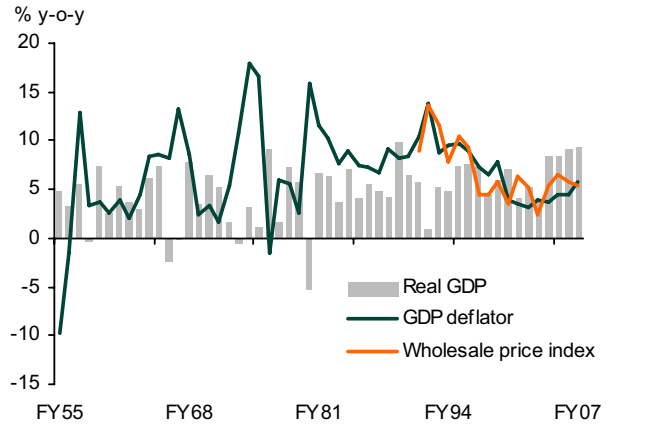
Lax fiscal policy crowds out private investment. The traditional argument is that large budget deficits and high public debt crowd out private investment, either by causing long-term interest rates to rise or by obliging banks to finance the high government spending at the expense of lending to private companies. Worsening fiscal finances can also raise the risk premium perceived by foreign investors and can lead to sovereign credit rating downgrades. Some argue that large governments are also negative for growth, as government departments tend to be less driven by competition and the profit motive and so can be less efficient in allocating resources (Folster and Henrekson, 1998).

Macroeconomic stabilisation. If firms expect economic crises to be frequent, they will hesitate to invest in order to expand capacity for fear of being saddled with unused capacity for frequent, significant periods. Similarly, households may tend to increase their precautionary saving rather than spend. Prudent macro policies and a sound regulatory and institutional framework can help minimise boom-bust cycles.

India's macro policies

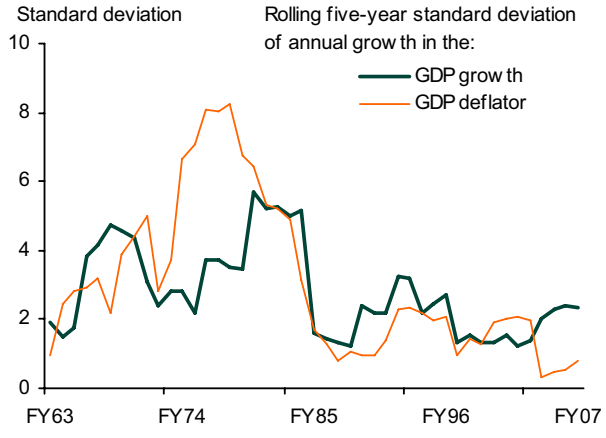
From a long-run perspective, India's macro policy performance has improved. Inflation bursts have been tamed, and inflation expectations have ebbed, obviating the need for monetary policy to tighten to the point of inducing recession and thereby damaging growth. There have been no GDP declines – which have been big in the past – since the late 1970s. Since the 1991 balance of payments crisis, GDP growth has risen and become more stable. Inflation, meanwhile, has been steadily brought down from above 10% (Figure 38). Moreover, the volatility of growth and inflation has fallen (Figure 39).

Figure 38. India's long-run GDP growth and inflation



Source: CEIC and Lehman Brothers.

Figure 39. The volatility of India's growth and inflation



Source: CEIC and Lehman Brothers.

More recently, wholesale price inflation rose from 3.9% y-o-y in April 2006 to a peak of 6.6% in March 2007; but it has since abated to 3.2% in mid-September thanks to a judicious monetary policy response from the RBI. The RBI raised the repurchase rate by a total of 175bp to 7.75% and also hiked the cash reserve ratio from 5.0% to 7.0% to help absorb excess liquidity.

The RBI deserves credit for successfully taming inflation without choking growth, for two reasons. First, it was unclear how much of the higher economic growth was cyclical rather than structural (although with hindsight it seems to have been predominantly the latter). Second, a significant part of the rise in inflation was due to surging food prices, a consequence of many years of weak agricultural output. Monetary policy is not well equipped to deal with inflation fuelled in this way, but such supply shocks, if long lasting, can raise consumers' inflation expectations (especially given that food makes up a hefty 27% of the consumption basket in India) thereby affecting wages and prices more generally.

Recognising this fact, the RBI coordinated its monetary policy with the government. The government – mindful of the impact of rising food prices on India's poor and, in particular, the related political significance of the price of the ubiquitous and emblematic onion – introduced several measures to tackle food shortages. These included such measures as reducing import duties on a range of items and banning exports of wheat and pulses.[30] The RBI is on track to meet its goal of containing inflation around 5.0% in FY08 and, in the medium term, aims to condition policy and perceptions for inflation in the range of 4.0-4.5%.

Historically, India has had a poor track record on fiscal policy. Since FY81 the consolidated (centre and state governments) budget deficit has averaged 8.0% of GDP, widening to as high at 9.9% in FY02. But more recently it has steadily improved, narrowing to an estimated 6.1% in FY07. India's fiscal consolidation over the past four years has been the most significant in the past quarter of a century (Figure 40).

In FY04, the Indian government enacted the Fiscal Responsibility and Budget Management (FRBM) Act, which created a medium-term fiscal planning framework for central government. The Act stipulates that the central government's revenue deficit should be reduced by 0.5% of GDP each year to eliminate it by FY09; and that its budget deficit should be reduced by 0.3% of GDP every year to no more than 3% of GDP by FY09. The central government's budget deficit narrowed to 3.5% of GDP in FY07, suggesting that the 3% goal for FY09 is within reach – at least in principle considering that the March 2009 target date coincides with the end of the current electoral cycle and the pressures that can bring to bear on even the most fiscally responsible administration. In addition, in April 2008 the Sixth Pay Commission will submit its recommended increase for the base salary of government workers (the Fifth Pay Commission recommended substantial pay increases to government workers, which were implemented in 1997, and was one of the key reasons for the increasing budget deficit).

That said, various fundamental federal tax reforms have been implemented, including: the rationalisation of excise duties; a move towards a median central value-added tax (VAT) rate; and the creation of a tax information network to prevent tax evasion. Consolidation has also been advanced at the state level. High-cost state debt has been reduced under the Debt Waiver and Relief Facility, coupled with the precondition that states enact their own FRBM. State finances have received a significant boost from the revenue buoyancy of the new state-level value-added tax. From 20 states which initially

[30] *The Indian government's banning of wheat exports was in part a reaction to domestic inflation as well as to shifts in the global wheat market triggered by the sudden upsurge in production of corn-based biofuels in the US and Europe in particular as a policy-driven response to global warming. As for the price of onions, as Amelia Gentleman wrote in the* International Herald Tribune *of 15 February 2007, "the onion plays an explosive role in Indian politics…. The most vital ingredient in Indian cooking, the basic element with which all dishes begin and, normally, the cheapest vegetable available, the pink onion is an essential item in the shopping basket of families of all classes." Ms Gentleman goes on to quote C.P. Chandrashekhar, professor of economics at Jawaharlal Nehru University in New Delhi, as follows: "The routine nature of consumption of onions means that a price rise quickly transmits onto the consumer's consciousness. It symbolises an overall feeling of inflation…. Once the vocal urban middle classes are affected, it becomes an issue politicians cannot ignore".*

adopted VAT in April 2005, today a further ten (including union territories) have followed suit, encouraged by the ability of the tax to generate funds to meet development needs. VAT has ceased to be a political issue and its economics have played an important role in improving the centre-state financial relation.

While there could be some fiscal slippage in the near term because of the political cycle, it is important to recognise that India's public debt dynamics have changed substantially in its favour since economic take-off, with the GDP growth-interest rate differential swinging sharply into positive territory. India's public debt declined from 82.4% of GDP in FY05 to 75.3% in FY07 and, on the assumption that the positive growth-interest rate differential and prudent fiscal policy both continue, the debt ratio could decline to about 60% or less by 2011-12 (see *Box 11: Estimating India's public debt dynamics*).

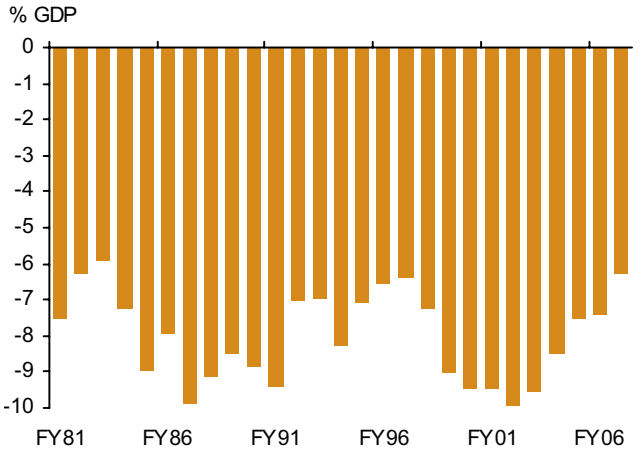
Continued medium-term progress on fiscal consolidation stands to have many positive effects on the economy. It should reduce the crowding out effect of private-sector investment, and it tends to put downward pressure on long-term interest rates, lowering the government's debt servicing costs and liberating fiscal space for more resources to flow towards productive expenditure. Lower government borrowing could also be expected to reduce the need to maintain such a high statutory liquidity ratio (SLR), thereby increasing the availability of funds lendable to the private sector. Indeed, this seems to be happening: total public infrastructure, both physical and "soft", rose from a low of 3.9% of GDP in FY05 to 5.0% of GDP in FY07.

India's economic fundamentals

Avoiding boom-bust cycles in developing economies is not easy. It requires not only prudent macro policies, but also a sound institutional and regulatory environment; healthy corporate and financial sectors; a sufficiently flexible exchange rate to avoid large external imbalances; and a deregulated and open marketplace to foster competition-induced efficiency gains.

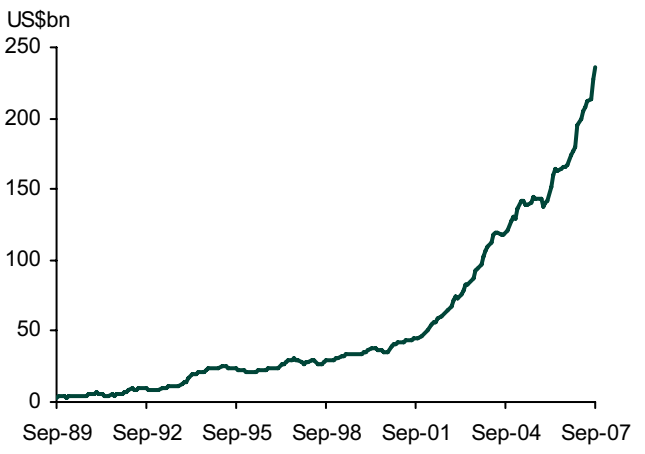
Inspection of key vulnerability indicators suggests that India's economic fundamentals have strengthened. On top of low inflation and improving fiscal finances, India's corporate sector has a light debt burden and its banking sector has a low net NPL ratio of 1.1% of net advances in FY07. Admittedly, India's current account has swung into deficit but, at close to 1.1% of GDP in FY07, it remains small; and there has been a major improvement in other external vulnerability indicators (see *Box 12: Lehman's Damocles model of external sector vulnerability*). For example, with FX reserves soaring to some US$236bn (Figure 41), India's ratio of FX reserves to short-term external debt

Figure 40. India's consolidated fiscal deficit



Source: Government of India, RBI and Lehman Brothers.

Figure 41. India's foreign exchange reserves



Source: CEIC and Lehman Brothers.

has risen from less than one in FY91 to about 16 in FY07. Against this background it is not surprising that Moody's raised its sovereign credit rating for India to investment grade in May 2006, while S&P lifted its rating to one notch above investment grade in January 2007.

Improving economic fundamentals and credit rating upgrades have further bolstered investor confidence in India's economy. However, they have also brought a new challenge to Indian policymakers: managing strong, persistent net capital inflows.

Strong capital inflows can be a mixed blessing: they facilitate economic growth and development; but they can also complicate the implementation of monetary policy. Like most other Asian countries, India faces the "impossible trinity". This holds that, at any given time, a country can have a combination of only two of three conditions: a fixed exchange rate, an open capital account and an independent monetary policy. With the rupee still a managed float and the capital account *de facto* open, the RBI's strategy of raising interest rates to tackle liquidity risks attracting even stronger capital inflows. This poses a policy dilemma for the RBI because letting the rupee appreciate risks crimping export competitiveness, while resisting rupee appreciation can compromise the autonomy of monetary policy and raise the risk of excess liquidity fuelling asset price bubbles.

Needless to say, India also faces other external risks which are outside its control such as a global growth slowdown, an oil price overshoot and geopolitical factors.

Box 11: Estimating India's public debt dynamics

India now has very favourable debt dynamics, creating a good opportunity to bring down its public debt-to-GDP ratio.

The change in the public debt-to-GDP ratio from one year to the next is given by the following identity:

$$\frac{D_t}{Y_t} - \frac{D_{t-1}}{Y_{t-1}} = \frac{P_t}{Y_t} + (R_t - G_t)\frac{D_{t-1}}{Y_{t-1}}$$

where:

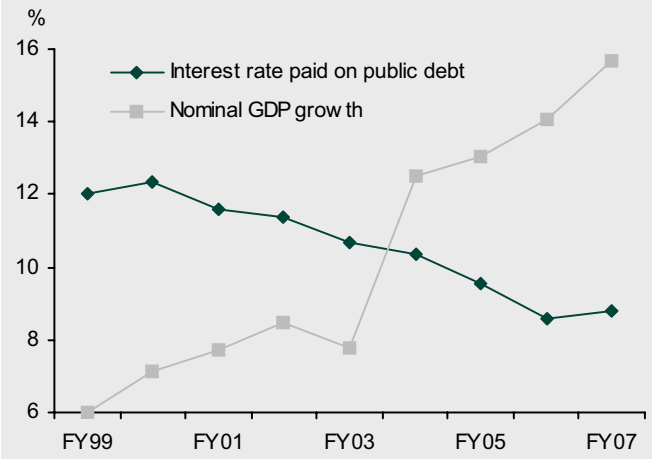
D is gross public debt of the general government (central plus state governments);
Y is nominal GDP;
P is the general government's primary balance, i.e., the fiscal balance excluding debt servicing costs;
R is the interest rate on public debt, calculated by dividing the government's interest payments by the debt stock in t-1;
G is the nominal GDP growth rate.

From the identity, the increase in the public debt-to-GDP ratio can be broken down into two parts: (1) the primary balance, which measures the fiscal balance excluding interest costs on the existing stock of debt; and (2) a debt-dynamic part, which is a function of the difference between the interest rate on the debt and nominal GDP growth. If the primary balance is zero, the public debt-to-GDP ratio will rise (fall) if the interest rate is higher (lower) than the GDP growth rate.

India's public debt dynamics have changed importantly in its favour since economic take-off, with the GDP growth-interest rate differential swinging sharply into positive territory (Figure 42). India's public debt-to-GDP ratio has declined from 82.4% in FY05 to 75.3% in FY07, largely because of the favourable public debt dynamics as the government is still running a primary budget deficit, albeit smaller than in the past. Moreover, as the name implies, debt dynamics tend to have self-fulfilling effects. For example, a lower public debt-to-GDP ratio reduces the government's cost of servicing debt, making it easier to reduce a primary deficit. Further, it can also lower the perceived risk premium which investors demand on holding debt and thereby lead to sovereign credit rating upgrades. Both help further support GDP growth and lower interest rates. How long India's favourable debt dynamics last will depend on progress on economic reforms (to sustain high growth) and prudent policies, especially monetary policy (to keep inflation in check).

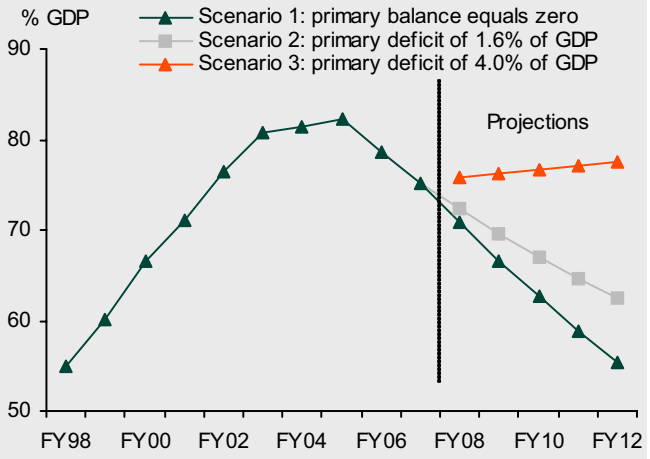
On the assumption that the existing GDP growth-interest rate differential remains constant, we have projected India's public debt through to FY12 under three different scenarios for the primary budget balance. The first makes the rather optimistic assumption given the election cycle that the primary budget balance (-0.4% of GDP in FY07) averages zero over the projection period, which would be the first time it has not been in deficit in over two decades. The second assumes that the primary deficit is 1.6% of GDP, the average over the past five years. The third assumes, pessimistically, that the primary deficit widens sharply to 5% of GDP, the highest since FY91. Our projections suggest that, under the first two scenarios India's public debt-to-GDP ratio in FY12 would decline to 55% and 62% respectively. Even under the pessimistic third scenario, the debt ratio would remain stable at 77% because of the favourable public debt dynamics (Figure 43).

Figure 42. India's nominal GDP growth and interest rate



Source: RBI, CEIC, and Lehman Brothers.

Figure 43. Projections of India's public debt-to-GDP ratio



Source: RBI, CEIC, and Lehman Brothers.

Box 12: Lehman Brothers' Damocles model of external sector vulnerability

High level of FX reserves, low external debt and large capital inflows mean that India has low vulnerability to a crisis.

Damocles is Lehman Brothers' proprietary early-warning system for assessing the risks of external financial crises in emerging market economies. It uses ten indicators which are widely recognised as possible predictors of external financial crises (see: *Damocles: Room for optimism*, 24 August 2007). These include: foreign reserves/imports; foreign reserves/short-term external debt; broad money/foreign reserves; external debt as % of GDP; short-term external debt as % of exports; current account as % of GDP; domestic private credit as % of GDP; the real short-term market interest rate; the stock market index; and the real trade-weighted exchange rate. Each indicator is allocated a signalling threshold and we use the noise-to-signal ratio method to weight each indicator to arrive at a composite index. A reading above 100 implies a 50-50 chance of an external financial crisis erupting over the next 12 months, whereas a reading above 65 implies a one-in-three chance.

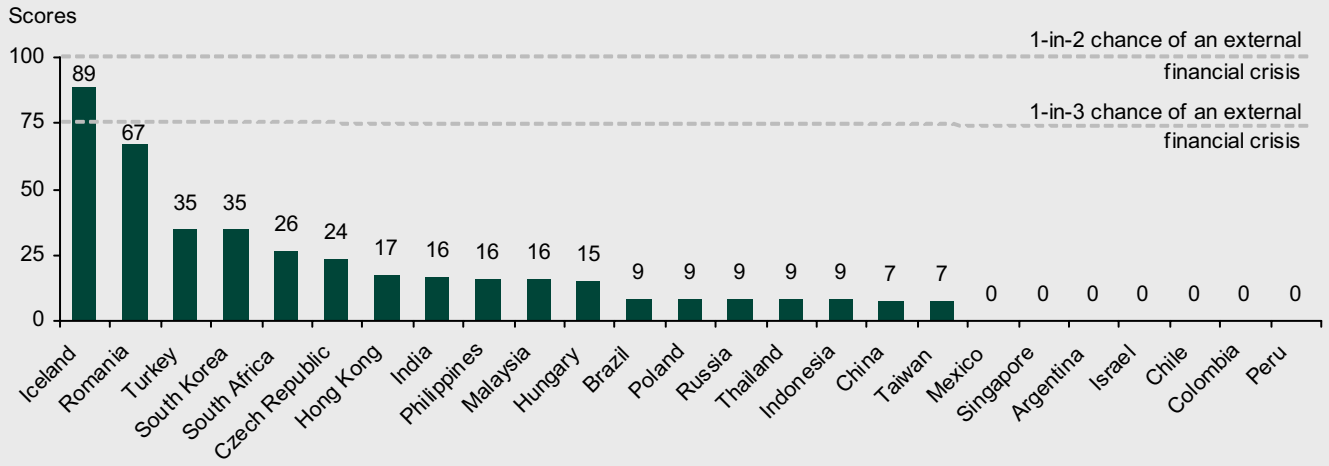
India's low Damocles score of 9 as of June 2007 reflects low external vulnerability because of a surge in FX reserves to a record high of US$236bn, little external debt and large capital inflows that are easily financing the country's small current account deficit (Figure 44). By contrast, our Damocles model indicates that Iceland and Romania have a one-in-three chance of experiencing financial difficulties (Figure 45). However, financial crises have a nasty habit of morphing into new forms; so Damocles should be supplemented with other information, including political risk. We judge that managing liquidity, while avoiding a too-rapid appreciation of the rupee in the face of very strong capital inflows, are key policy challenges for India.

Figure 44. Vulnerability indicators of India's economy

Indicators	"Safe" threshold	FY91	FY05	FY06	FY07
Foreign reserves/imports	Above 6	1.2	14.9	12.2	12.3
External debt as % of GDP	Below 50%	28.7	18.0	15.8	16.6
Foreign reserves / short term external debt	Above 1	0.3	24.2	16.7	16.0
Current account as % of GDP	Above -3%	-3.1	-0.4	-1.1	-1.1
Consolidated fiscal balance, % GDP	Above -3%	-9.4	-7.5	-7.5	-6.1
Consolidated public debt, % GDP	Below 50%	64.9	82.6	79.5	78.6
Private credit as % of GDP	Below 100%	30.2	33.9	41.1	46.3
WPI inflation, % y-o-y	Below 5%	10.3	6.5	4.4	5.4
Non-performing loan ratio, %	Below 5%	n.a.	4.9	3.3	n.a.

Source: CEIC, RBI and Lehman Brothers. The "safe" thresholds are our own subjective estimates.

Figure 45. Individual Damocles scores for June 2007



Source: Lehman Brothers.

FOREIGN TRADE AND INVESTMENT

India has doubled its trade-to-GDP ratio over the past seven years to almost 50%. We judge that it could double again in the next decade if the business climate improves, which could add 1.5 percentage points to GDP growth.

Theory

The economic literature, barring some exceptions, suggests that increased openness to trade and foreign direct investment (FDI) has a positive and pronounced impact on a country's economic growth, especially in developing economies.[31] Furthermore, recent studies have found that the link between economic openness and growth has become stronger over time, and that economic openness helps stimulate labour shifts out of agriculture, thereby boosting productivity growth.[32] In particular, a recent study of countries that have experienced economic take-off found that *de jure* trade openness policies play a prominent role in determining whether or not a take-off occurs.[33]

The economic gains can accrue through several channels:

- Trade increases the efficiency with which resources are deployed across countries through exploitation of comparative advantages.
- Access to foreign markets allows the exploitation of economies of scale as firms are able to expand production, distribution and marketing.
- Imports provide access to resource endowments not readily available domestically.
- FDI diffuses new skills, technologies and international best practice.
- Foreign competition enhances efficiency and productivity.

Practice - Trade and FDI liberalisation in India

India has a good story to tell on trade and inward investment liberalisation, which are among its most advanced areas of economic reform. Trade liberalisation in India began in the early 1980s and gained momentum following the 1991 balance of payments crisis. Most of the licensing restrictions on imports of raw materials, intermediate and capital goods have now been eliminated. The peak import tariff rate on non-agricultural goods has fallen from 300% in FY92 to 10% in FY08 and the government has pledged to reduce the tariff to ASEAN levels (currently around 8.5%) by 2009. Also, while the Doha round of global trade negotiations (in which India is a major player) has stalled, India has pressed ahead with a plethora of regional and bilateral free trade negotiations. For details see *Box 26: The economy and international relations*, and Appendix 8: Status of India's bilateral and multilateral trade policies.[34]

Similarly, India's regulatory regime for foreign direct investment (FDI) has been substantially liberalised since 1991 and today is no longer particularly restrictive by international standards. In 1991, FDI policy was amended to allow automatic approval of up to 51% ownership in 34 sectors. That list was expanded to 111 sectors in 1997.

Today, 100% FDI is permitted in most sectors; but some are still capped – notably, air transport, finance and telecommunications – while FDI is not permitted at all in a small number of sectors: retail trading bar single-brand products, betting and gambling, nuclear power and agriculture (see Appendix 9: India's Foreign Direct Investment Policy).

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[32] *Notable papers supporting this view include Barro and Sala-i-Martin (1995), Sachs and Wanrer (1995), Frankel and Romer (1999), and Bassanini, Scarpetta and Hemmings (2001). A contrary view can be found in Rodriquez and Rodrick (2000).*

[32] *See, for example, Vamvakidis (2002), Williamson and Clemens (2002) and IMF (2006).*

[33] *See Aizenman and Spiegel (2007). Using probit estimation, the authors find that a one standard deviation increase in* de jure *trade openness is associated with a 55% increase in the probability of take-off.*

[34] *The Indian government has stressed that, for the Doha round of trade talks to make progress, a key issue is the reduction of farm support in developed countries which, India argues, would aid its vulnerable and under-developed agricultural sector.*

No longer a closed economy

As a result of trade and inward investment liberalisation, measures of Indian economic openness are taking off. India's total trade (exports plus imports) as a share of GDP has doubled over the past seven years to almost 50% in FY07, while FDI inflows have more than doubled from US$7.7bn in FY06 to a record US$19.4bn in FY07. Furthermore, judging by the global integration experiences of other Asian economies, India's take-off is still in its early stages (Figures 46 and 47).

Box 13: India goes global

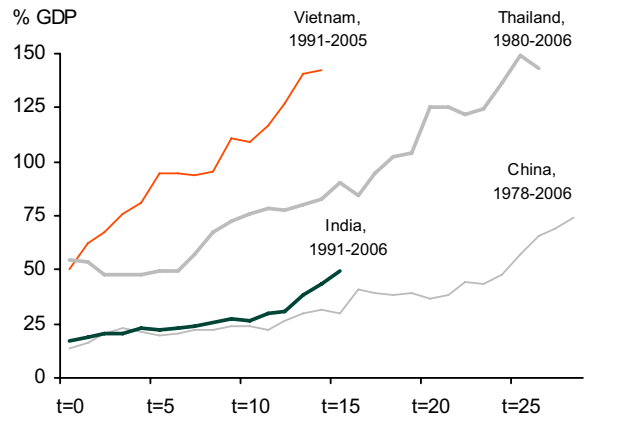
Access to foreign markets and technology, easy funding and fewer restrictions have propelled outward FDI from India.

A rising ambition to be globally competitive has unleashed a boom in overseas acquisitions by Indian companies, which is unusual for an economy still at an early stage of development. Outward FDI from India has grown strongly, from US$2.5bn in 2005 to almost US$10bn in 2006.

The boom. The initial boom in outward FDI started with software companies, which took the acquisition route both to enlarge and diversify their customer base and to move up the value chain. Now, a similar rise is being seen in manufacturing. Access to production facilities, technology, foreign markets and international brand names were key factors behind Tata Motors' acquisition of Daewoo Motors (see Box 6: Economies of scale and scope: a case study of the Tata group). Pharmaceutical firms such as Ranbaxy are investing abroad to access technology and knowledge by setting up their own R&D facilities in countries such as China and the United States. Access to natural resources is spurring overseas acquisitions in sectors such as steel, oil and gas, and aluminium: for example, Hindalco acquired two copper mines in Australia in 2003 and recently purchased Novelis for US$6bn, making it a low-cost aluminium producer with a global footprint. Oil and Natural Gas Corporation (ONGC) has invested in Sudan and Russia to secure supplies of gas; and, last year, Tata Steel took over Corus for US$13.6bn. Meanwhile, Tata Power's acquisition of PT Kaltim Prima Coal and PT Arutmin Indonesia in 2007 for US$1.1bn has given it the access to the largest exporting therma coal mines in the world. Much of India's outward investment is in the US and Europe (for market access and technology), followed by Russia (natural resources), Mauritius and the British Virgin Islands (for tax advantages).

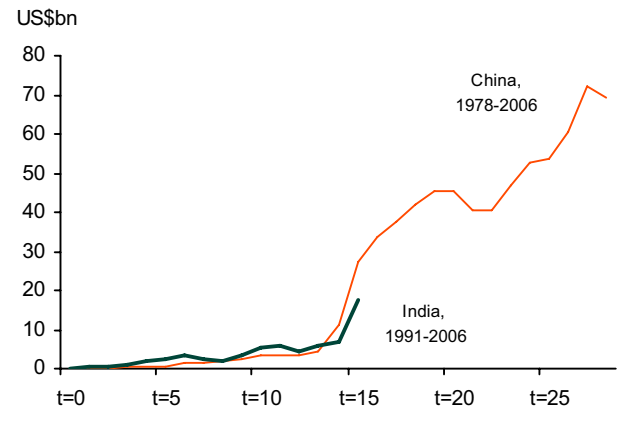
The drivers. As highlighted by the IMF in its February 2007 Article IV consultation on India, relative to companies in most other developing economies, Indian corporates have found it easier to "go global" because their business models are very similar to western ones in terms of both framework and governance, and they have managers who have been trained overseas and/or who speak English. Surging capital inflows have given the Indian government greater confidence in easing restrictions on outward FDI. From an earlier cap of US$100m, Indian companies are now allowed to invest up to 400% of their net worth. In 2006, the RBI also allowed proprietary or unregistered partnership firms to set up joint ventures or wholly owned subsidiaries abroad. Furthermore, India has signed a number of bilateral investment treaties and double taxation agreements which have facilitated investment in partner countries.

Figure 46. The take-off in trade (exports plus imports) for some low-income Asian countries



Source: World Bank, CEIC and Lehman Brothers.

Figure 47. Foreign direct investment in India and China



Source: CEIC and Lehman Brothers.

India has many comparative advantages in international trade and FDI, including: a large domestic market; a potentially massive pool of relatively low-cost, young, English-speaking labour; impressive information-communication technology capabilities; strong enforcement of intellectual property rights; and a vibrant equity market. Already, India is a world-class exporter of information and communication technology services – such as software development, call centres and business process outsourcing – and has made inroads into some capital-intensive industries, notably auto parts and petrochemicals (Figure 48).

With strengthening FDI inflows, India has the potential to become a critical part of Asia's elaborate production network (Figure 49). More unusual for an economy still in the early stages of development, there has also been a surge in outward investment by Indian corporates to gain access to foreign technologies and markets (see *Box 13: India goes global*).

The favourable environment is not just for FDI, but also for other forms of investment. According to Dealogic, private equity (PE) investment in India rose to US$3.8bn in the first eight months of 2007 compared with a total of US$2.6bn in 2006 and US$2.2bn in 2005. The strength and liquidity of India's stock market helps as it facilitates an eventual stake sale. Today, most large US-based firms like The Carlyle Group, The Blackstone Group and General Atlantic have done PE deals in India. Venture capital investment has also been large in the technology and real estate sector. For instance, Microsoft launched a US$1.7bn commitment to R&D and venture-capital investments, while Cisco launched a US$100m commitment.

Given that India's economy is still in the early stages of economic take-off and that its capital account has already been liberalised substantially, we judge that capital inflows will remain strong, and most likely intensify. India's *net* FDI inflows, which nearly doubled to US$7.8bn in 2006, could surge to US$50bn in 10 years. India's other net capital inflows, including portfolio and external commercial borrowings totalled US$30bn in 2006, and our projection is that they could swell to US$170bn in ten years' time. So despite a small current account deficit, we expect India's large capital account surplus to place significant pressure on the rupee to appreciate. We expect the RBI to manage the pace of currency appreciation through FX intervention, causing India's FX reserves – which totalled US$236bn in mid-September 2007 – to quadruple to about US$900bn by 2017.

Untapped comparative advantages

While India has had success in exporting software services, business process outsourcing and some capital-intensive manufacturing, it has failed to capitalise fully on its global comparative advantages in labour-intensive sectors of manufacturing, agribusiness and tourism. Tapping these areas could transform India into a global manufacturing hub and tourist destination and help employ the tens of millions of young people who will enter the workforce in the coming decade. In an effort to seize this opportunity, the current government has accelerated the programme of setting up special economic zones (see *Box 14: Sizing up India's SEZs*).

Box 14: Sizing up India's SEZs

While not a first-best solution, the success of SEZs could be a catalyst for removing the barriers to business nationwide.

A largely unknown fact is that Asia's first special economic zone (SEZ) was set up in India in 1965. However, the expansion of SEZs was very slow; only eight existed by 2004. This pedestrian development led the current government to introduce a new, more favourable SEZ policy which was inscribed into law in February 2006.

India's new SEZ policy offers several incentives to zone developers and potential business occupiers alike, notably:

- 100% income tax exemption on export income for SEZ units for the first five years, 50% exemption for the following five years and for the five years thereafter a 50% exemption on re-invested profits.
- Duty-free imports/domestic procurement of goods for development, operation and maintenance of SEZ units.
- Exemption from the minimum alternate tax, the central sales tax and the service tax.
- Single window clearance for central and state-level approvals for development in the SEZ.
- In some states, partial relaxation of labour laws.

As of 19 September 2007, formal approvals – given to those projects that have already secured land – had been granted to 386 SEZs, while a further 176 had been approved in principle as meeting the criteria but had still to secure land. The final stage in the process is notification, which is when physical development can begin on site. As of August 2007, 149 SEZs had been notified.

The benefits. Proponents of SEZs argue that they will promote exports and foreign direct investment, encourage private infrastructure development, draw surplus labour off the land into more productive employment, boost research and development, help develop new niche industries, and create clusters where economies of scale provide positive externalities.

The costs and risks. There has been considerable opposition to the developments of SEZs in India for three main reasons.

First, most of the projects on SEZs are Indian business initiatives which, it is argued, would probably have occurred anyway, with the unwanted consequence that their designation as "SEZs" – and the associated very generous tax breaks – constitutes an unnecessary loss of revenue for the government. Second, most of the formally approved SEZs are small – the average land size is 1.3sq km – suggesting that the projected economic benefits from clustering and infrastructure development may prove optimistic. And third, in part because India is a democracy, acquiring land for SEZs has been challenging, primarily because of concern – including among India's political classes – that poor rural households could be displaced without fair compensation for their loss of livelihood and property rights. This has been coupled with worries that, rather than productive investments of the type that the government is hoping to stimulate, SEZs could fuel real estate speculation where land is acquired cheaply, fitted with basic infrastructure and sold on to build hotels and shopping centres.

For these reasons, and particularly the concern over "land grabbing", INC President Sonia Gandhi has publicly spoken out against the use of agricultural land for SEZs in order to prevent the large-scale uprooting of farmers. They also underpinned a wave of social protests which turned violent in January 2007 in West Bengal. As a result, new approvals were frozen in January 2007, giving time for the government to review its policy. As a result of this review, the government unveiled a raft of new criteria for setting up SEZs before lifting its self-imposed freeze on new approvals in April 2007. The new rules limit the maximum size of the SEZs to 50sq km, designate that at least 50% of the land acquired for SEZs be used for manufacturing, require developers to give a job to at least one member of every family displaced by an SEZ, and forbid state governments from using their powers of eminent domain to acquire land compulsorily for private developers.

It remains an open debate in India whether the economic and social benefits of SEZs outweigh the costs. There are positive stories: Nokia and Flextronics electronics hardware SEZ in Sriperumbudur are already employing 3,800 and 2,069 workers, the majority of which are woman. Apache SEZ being set up in Andhra Pradesh plans to employ 20,000 workers. The first private sector IT-ITeS SEZ at Coimbatore is likely to create 30,000 jobs in three years, while Brandix Apparels, a Sri Lankan FDI project, is setting up an SEZ to provide employment to 60,000 over the same period. Overall, the government's projection is that the SEZs formally approved thus far will, once operational, provide investment of INR3tr (US$75bn) and will create 4m new jobs.

While not a substitute for economy-wide reform, we are optimistic that the development of SEZs could build pockets of excellence in infrastructure and industry – perhaps especially in Indian states which remain relatively underdeveloped economically at present – to help India capitalise on its global comparative advantages in labour-intensive industries. In this way, the success of SEZs could be a catalyst for breaking down the barriers to business nationwide.

Consider three examples where India appears to have large comparative advantages which have yet to be utilised fully.

First, textiles. India is resource rich in cotton and its textile industry spans the entire supply chain; yet its clothing and textile exports comprise only 5% of the world total, compared with 59% for China. This is largely because in India the sector is dominated by small-scale producers who use obsolete technologies, and who are handicapped relative to competitors in other countries by infrastructure and regulatory hurdles (see also *Box 24: A legacy of anti-materialism*). As a result, China enjoys an estimated 13% cost advantage over India in shipping garments to the United States (Ananthakrishnan, 2005). Modernisation and associated up-scaling of the industry, coupled with improvements to the support infrastructure has the potential both to help India become a global manufacturing hub and create jobs for less skilled workers who are at present excluded from the formal sector. Also, starting to work in India's favour are the rising costs in China's textile industry because of appreciation of the renminbi and the reduction in value-added tax rebates on textile exports.

Second, food. India is the world's largest producer of milk and the second largest producer of food, yet its food and live animal exports make up just 1.6% of the world total. Underpinning this is the fragmented nature of the agricultural sector, with over 100m small farms, coupled with widespread dependence on outdated technologies, both in production and in the rural-to-retail supply chain which is subject to streams of red tape and *ad hoc* fees, and which lacks the requisite infrastructure to handle the transport and storage of perishables. The infrastructure is so deficient that, of India's total output of fruit and vegetables, only 2% are processed and some 30% rot before reaching market.

Downstream, India's retail sector, long protected against foreign ownership, is dominated by over 12m "mom and pop" outlets with an average size of less than 50 square meters. This has further impeded the development of an efficient agribusiness. Only 3% of India's total retail sales is based in "organised retail" and less than 10% of the total food market is branded.

Recognising that almost half of India's land mass is arable (versus 13% worldwide), that it has over 7,517km of coastline and that it is home to 17% of the world's population, it is clear that India's food industry offers enormous potential. Last year, the partial opening up of the retail sector led to India's Reliance Industries announcing a goal "to bring the world to Indian farmers", with plans to build a nationwide retail network of 1,000 hypermarkets and 2,000 supermarkets within four years, plus a distribution system to ensure an "integrated farm-to-fork supply chain". Some foreign retailers, including Wal-Mart of the US, have entered the Indian market but for cash-and-carry, or wholesale, services only; they are still prohibited from operating front-end stores. Indeed, FDI in India's retail sector is not allowed except for single-brand products.

Figure 48. India's major exports

	FY02 US$bn	FY03 US$bn	FY04 US$bn	FY05 US$bn	FY06 US$bn	FY07 US$bn	FY07 % total
Primary products	7.2	8.7	9.9	13.6	16.4	19.5	15.5
- Agriculture products	5.9	6.7	7.5	8.5	10.2	12.5	9.9
- Ores & minerals	1.3	2.0	2.4	5.1	6.2	7.0	5.6
Manufactured goods	33.4	40.2	48.5	60.7	71.8	82.8	65.6
- Leather & leather goods	1.9	1.8	2.2	2.4	2.6	2.9	2.3
- Chemicals & allied products	4.1	7.5	9.4	12.4	14.5	16.7	13.2
- Iron and steel	0.9	1.9	2.5	3.9	3.5	5.2	4.1
- Manufacture of metals	1.6	1.8	2.4	3.4	4.2	5.0	4.0
- Machinery & instruments	1.7	2.0	2.8	3.7	4.8	6.5	5.1
- Transport equipment	1.0	1.3	2.0	2.8	4.6	4.9	3.9
- Electronic goods	1.2	1.3	1.7	1.8	2.2	2.7	2.2
- Other engineering goods	0.5	0.7	1.0	1.6	2.3	4.7	3.7
- Textile & textile products	10.2	11.6	12.8	13.6	16.0	17.0	13.5
- Gems & jewellery	7.3	9.0	10.6	13.8	15.5	15.6	12.3
- Others	1.0	1.4	1.2	0.4	0.4	0.4	0.3
Petroleum products	2.1	2.6	3.6	7.0	11.5	18.6	14.7
Others	1.2	1.2	1.9	2.3	3.0	5.4	4.3
Total goods exports	43.8	52.7	63.8	83.5	103.1	126.3	100.0

Source: CEIC. Ministry of Commerce and Lehman Brothers.

Figure 49. India's major export destinations

	FY02 US$bn	FY03 US$bn	FY04 US$bn	FY05 US$bn	FY06 US$bn	FY07 US$bn	FY07 % total
EU	10.1	11.8	14.4	18.1	23.1	25.8	20.4
- France	0.9	1.1	1.3	1.7	2.1	2.1	1.7
- Germany	1.8	2.1	2.5	2.8	3.6	4.0	3.2
- Italy	1.2	1.4	1.7	2.3	2.5	3.7	2.9
- UK	2.2	2.5	3.0	3.7	5.1	5.5	4.4
Africa	1.7	1.8	2.3	3.0	3.5	5.6	4.4
US	8.5	10.9	11.5	13.8	17.4	18.9	14.9
Canada	0.6	0.7	0.8	0.9	1.0	1.2	0.9
Latin America	1.0	1.3	1.1	2.2	3.0	4.3	3.4
West Asia & North Africa	5.8	7.5	10.2	14.2	16.7	23.0	18.2
- UAE	2.5	3.3	5.1	7.3	8.6	12.0	9.5
East Asia	9.8	13.1	15.9	22.5	27.6	33.4	26.4
- China	1.0	2.0	3.0	5.6	6.8	8.3	6.6
- Japan	1.5	1.9	1.7	2.1	2.5	2.8	2.2
South Asia	2.1	2.8	4.3	4.6	5.5	6.5	5.1
- Bangladesh	1.0	1.2	1.7	1.6	1.7	1.6	1.3
Other	4.3	2.8	3.3	4.3	5.2	7.7	6.1
Total goods exports	43.8	52.7	63.8	83.5	103.1	126.3	100.0

Source: CEIC, Ministry of Commerce and Lehman Brothers.

CRISIL Research (2007), the Indian affiliate of Standard and Poor's, estimates that liberalising organised food retailing could boost India's GDP growth by 1.5 percentage points.

The modernisation of the retail sector may pose some threat to the livelihoods of small shopkeepers, and it has triggered a political backlash in some states, such as Uttar Pradesh, where Reliance Retail was forced in August 2007 to shut ten of its new fresh supermarket stores and lay off 1,000 staff. However, modernising the retail sector has the potential to be a major catalyst for reform of the agricultural sector and, therefore, more inclusive growth nationwide. This could be a significant stepping-stone towards India becoming a food factory for Asia, a region which accounts for more than half of the world's population – and one where incomes are rising rapidly, leading to increased caloric intake and expanding dietary preferences. Organised retail can help set up supply chains, give better prices to farmers for their produce and facilitate development of the agro-processing industries, while the presence of foreign retailers is likely to help generate the much-needed export-market linkage for Indian suppliers.

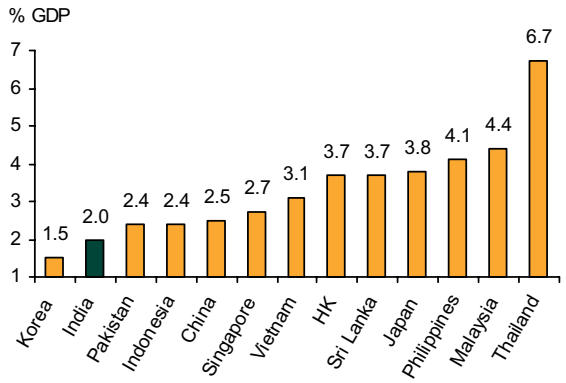
Third, tourism. Business travel and foreign tourist interest in India is growing strongly, but from a low base. As a share of GDP, the size of India's tourist and travel industry is estimated at only 2%, the second lowest among a selection of Asian countries and well below the world average of 3.6% (Figure 50). And yet, India has 27 properties on the World Heritage List, the second highest in Asia after China (34); and, with so many great tourist attractions, the World Travel and Tourism Council has identified India as one of the world's foremost tourist growth centres in the coming decade. Furthermore, the potential of this rich history and cultural heritage can only be enhanced by the availability of low-cost labour to help take advantage of new niches such as medical and adventure tourism and by the benefit to India's broad reputation in leisure and entertainment which the success of Bollywood has brought.

All that being said, to substantially increase the number of visitors to India, tourism infrastructure needs to be upgraded including international airport facilities, intra-India transport to tourist destinations and tourist hotels consistent with international standards and competitive in cost terms. For example, a hotel room in Bangalore now costs about US$299 a night, as much as anywhere in the world.

As these three examples illustrate, having substantially liberalised its trade and FDI regimes, India has yet to capitalise fully on its global comparative advantages in labour-intensive exports, and therefore has yet to reap the economies of scale from exporting textiles, agribusiness and tourism to the rest of the world.

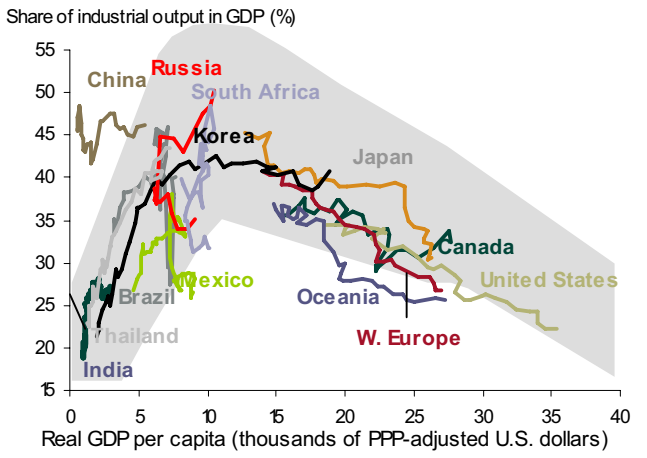
The so-called Three-sector Hypothesis developed by Clark and Fourastié in the 1930s

Figure 50. Size of travel and tourism industries 2006



Source: World Travel and Tourism Council and Lehman Brothers.

Figure 51. The share of industrial output in GDP at various stages of economic development, 1965-2004



Source: IMF's World Economic Outlook, Sept 2006 and Lehman Brothers.

shows that economic development typically follows a pattern where production first shifts from primary to secondary industries and then, as economies mature, to tertiary industries. The resource shift out of low-productivity agriculture to higher-productivity manufacturing and services should boost the overall productivity of the economy. From this vantage point, India's experience is quite unusual for a developing economy: its services sector has been developing faster than its manufacturing sector such that tertiary output makes up 55% of GDP versus 27% for secondary and 18% for primary. India's manufacturing share is low for such a large, low-cost economy in an era of rapid globalisation, and it is particularly low in comparison to its Asian peers (Figure 51).

India's low share of labour-intensive manufacturing output and failure to scale up its labour-intensive industries are largely because of the constraints to business, including weak infrastructure, bureaucracy and labour market rigidities. Breaking down these barriers would pave the way for many more Indian companies to grow into world leaders. For example, Hsieh and Klenow (2007) find that improving resource misallocation across plants within an industry could give productivity gains of 40-50% in India's manufacturing sector.

The window is more open than ever for India to seize this opportunity, and the economic payoff should be substantial. Based on panel data across 35 countries, we have found a statistically significant positive relationship between GDP growth and the trade-to-GDP ratio. Moreover, the impact of the trade-to-GDP ratio becomes more powerful for a sub-set of countries with fast developing economies, with the rule of thumb that a 10 percentage point rise in trade/GDP can lift GDP growth by 0.3 percentage points (*Box 15: Estimating the impact on GDP growth from rising economic openness*).

India's trade-to-GDP ratio doubled over the past seven years to almost 50%. Furthermore, we judge that it has the potential to double again in the next decade if the business climate continues to improve in ways we discuss in the next section.

India has much to gain in attracting FDI and lifting its trade-to-GDP ratio to 100%. Our empirical results suggest that this could raise the country's GDP growth rate by 1.5 percentage points.[35] This may seem ambitious; but we see no reason why India's trade-to-GDP ratio cannot follow the trajectory of China's which surged from 48% in 2002 to 73% in 2006, especially considering the following three factors: (1) this is an era of rapid globalisation; (2) over half the world's population is in Asia and personal incomes are rising rapidly; and (3) with intensifying competition in Asia, multinationals will be seeking new lower-cost processing and assembly centres to outsource production – a key element which has helped sustain the region's export-led development growth model, famously described as the "flying geese" pattern.[36]

[35] *This figure is obtained as follows: we estimated the rule of thumb that a 10 percentage point rise in the trade/GDP ratio can lift GDP growth by 0.3 percentage points (see Box 15: Estimating the impact on GDP growth from rising economic openness). Therefore, if India's trade/GDP ratio doubles over the next decade, from 50% to 100%, it can raise India's GDP growth rate by 1.5 percentage points [(100-50)x0.03].*

[36] *The 'flying geese' pattern initially applied to Japan in the 1930s. In the late 1960s, 1970s and early 1980s, companies in Japan (the "head goose") would outsource the assembly of motor vehicles and consumer electronics to the newly industrialised economies (NIEs) of Korea, Taiwan, Hong Kong and Singapore ("flying geese"). In the late 1980s and 1990s, faced with rising business costs, companies in Japan and the NIEs, started outsourcing the more labour-intensive divisions of production to the lower-cost South-east Asian countries, notably Malaysia, Thailand, Indonesia and the Philippines. The latest development this decade is China becoming the key outsourcing centre. Expectations are that Vietnam and India are future possible candidates.*

Box 15: Estimating the impact on GDP growth from rising economic openness

For developing economies, we estimate that a 10pp rise in the trade-to-GDP ratio can lift GDP growth by 0.3% points.

To explore the relationship between increased foreign trade and economic growth we estimated the following equation:

$$Y_i = \alpha + \beta Openness_i + \delta GDPpercap_i + e_i$$

where:

Y_i is the rate of real GDP growth of country i;
Openness is measured as exports plus imports of goods and services as a share of GDP;
GDPpercap is nominal GDP per capita in US$ to control for the different stages of economic development of each country;
e is the error term.

The average value for each of the three variables was calculated over 1970-2006 for 35 countries. The countries were fairly evenly split between developing and developed economies and included: Argentina, Australia, Brazil, Canada, China, Chile, Czech Republic, France, Germany, Hong Kong, Hungary, India, Indonesia, Italy, Japan, Korea, Malaysia, Mexico, New Zealand, Pakistan, Peru, Philippines, Poland, Romania, Russia, Singapore, South Africa, Spain, Taiwan, Thailand, Turkey, UK, US, Vietnam and Venezuela. The equation was estimated using OLS regression; and White-consistent standard errors were used to correct for heteroskedasticity, a common problem with panel data.

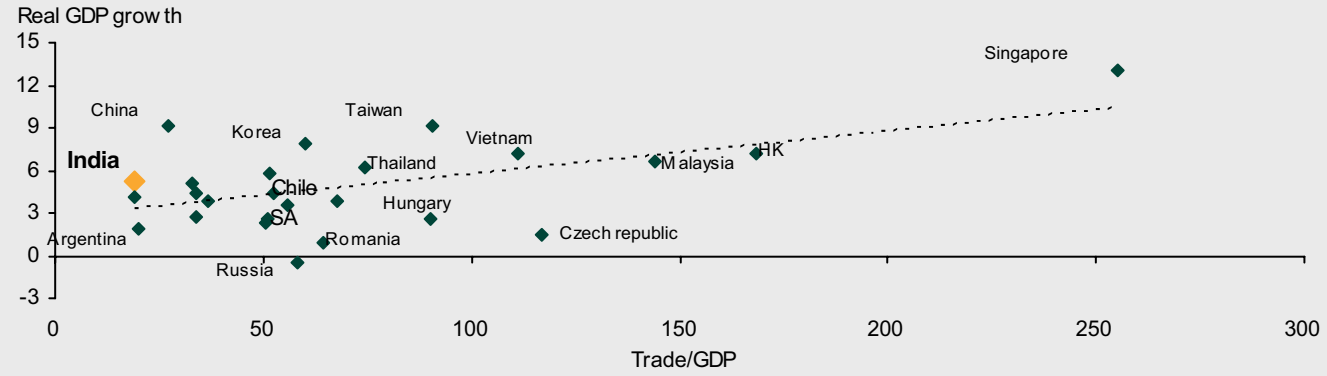
The results are shown in Figure 52. In the first regression, the coefficient on Trade/GDP has the "correct" positive sign and is statistically significant at the 1% probability level, but its size (0.0145) is small – a 10 percentage point (pp) rise in the trade-to-GDP ratio lifts GDP growth by 0.15pp. Theory suggests that greater economic openness should have a larger impact on GDP growth for countries that are in the early stages of economic development because they can exploit economies of scale and the competitive advantage of cheaper labour. To test this, we deleted data for countries whose GDP per capita for any given year was above the average GDP per capita of our sample. A scatter plot of GDP growth versus trade/GDP for our streamlined sample of developing economies is shown in Figure 53. In the second regression, the coefficient on trade/GDP remains statistically significant at the 1% probability level and has doubled in size, consistent with our priors. The results suggest that, for developing economies, a 10pp rise in trade/GDP can lift GDP growth by a non-trivial 0.3pp. Moreover, this is likely an underestimate since we have not considered the positive effects from FDI or the indirect effects of increased foreign competition enhancing efficiency and productivity.

Figure 52. Estimating the relationship between the ratio of trade to GDP and GDP growth

	Regression 1		Regression 2	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	3.63	6.0	4.87	5.4
Trade/GDP	0.0145	5.5	0.0295	4.8
GDP per capita	-0.0001	-2.2	-0.0009	-4.1
R-squared	0.23		0.50	
SE of regression	1.97		2.24	
Durbin-Watson statistic	1.07		1.54	

Source: Lehman Brothers.

Figure 53. Average GDP growth and trade/GDP ratios over 1970-2006 for a sample of developing economies



Source: World Bank, IMF, CEIC and Lehman Brothers.

ECONOMIES OF SCALE AND COMPETITION

Deficient infrastructure, bureaucracy, and labour market constraints all contribute significantly to the large economic disparities across and within India's states, and militate against the government's drive to more inclusive growth.

India's recent economic growth acceleration has been spearheaded by private companies. The cumulative effects from market-opening reforms are raising competition, diffusing new management know-how and technologies, and generally unleashing entrepreneurial zeal. First, it was India's software and business process outsourcing companies which quickly seized the opportunities presented by globalisation and the dotcom boom; now, large, globally competitive Indian manufacturing companies are starting to emerge.

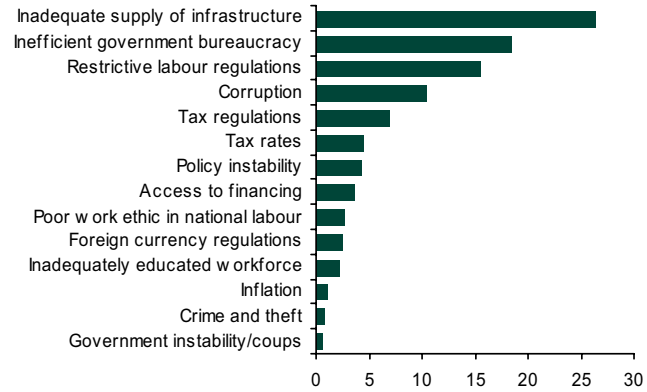
However, India's business environment is still well below international best practice, with deficient infrastructure, burdensome bureaucracy and a rigid labour market among the major constraints (Figure 54). Despite some recent success stories, many Indian companies fail to grow and are, therefore, failing to realise economies of scale because of the above constraints. Indian manufacturers often set up a number of small enterprises (in garments, sports goods and toys, for example) rather than having one large, efficient enterprise.

The average size of Indian manufacturing companies is substantially below that in other countries. Kochhar *et al* (2006) estimate that the average value-added production is only US$300,000 per Indian firm, less than one tenth the average of a sample of other (mostly developing) economies. Indian businesses are having to "make do" by coming up with their own innovative solutions, such as installing their own power generators, turning to contract labour and creating their own job training programmes. For example, Infosys Technologies is investing US$300m in its own training centre in the southern city of Mysore.

Such remedies are clearly not sustainable indefinitely. There is, therefore, much at stake as to whether the government can successfully further ease the shackles on business. Failing to do so will make it difficult to sustain the recent growth acceleration, whereas doing so would offer enormous potential for Indian business to become more competitive and to capitalise on its global comparative advantages, thereby reaping the productivity gains from economies of scale.

Indian companies and foreign companies alike seem optimistic. A survey of the world's largest firms shows that India has risen to become the second most attractive destination for foreign direct investment, reflecting a long-term commitment consistent with an increasingly favourable business climate (Figure 55).

Figure 54. Main constraints on doing business in India*



** From a list of 14 factors, respondents were asked to select the five most problematic for doing business in India and to rank them from 1 to 5. The figure show the responses weighted according to their rankings, where the higher the figure the more problematic the factor.*

Source: World Economic Forum's Global Competitiveness Report, FY07.

Figure 55. FDI confidence index, top 15 countries*

	2000	2001	2002	2003	2004	2005
1	US	US	China	China	China	China
2	UK	China	US	US	US	**India**
3	China	Brazil	UK	Mexico	**India**	US
4	Brazil	UK	Germany	Poland	UK	UK
5	Poland	Mexico	France	Germany	Germany	Poland
6	Germany	Germany	Italy	**India**	France	Russia
7	Mexico	**India**	Spain	UK	Australia	Brazil
8	Italy	Italy	Canada	Russia	Hong Kong	Australia
9	Spain	Spain	Mexico	Brazil	Italy	Germany
10	Australia	France	Australia	Spain	Japan	HK
11	**India**	Poland	Poland	Gfrance	Russia	Hungary
12	France	Canada	Japan	Italy	Poland	Czech Rep.
13	Canada	Singapore	Brazil	Czech Rep.	Spain	Turkey
14	Thailand	Thailand	Czech Rep.	Canada	Czech Rep.	France
15	Korea	Australia	**India**	Japan	Malaysia	Japan

** CEOs of the world's 1,000 largest firms are surveyed on the most attractive destinations for future FDI. The lower the score, the more attractive the destination.*

Source: A.T. Kearney. http://www.atkearney.com/main.taf?p=5,3,1,89

However, many of the potential fruits of economies of scale remain to be exploited, and this generally requires a growing market which permits output to be produced on a larger and larger scale (for more details, see section on 'The limited usefulness of growth accounting' in chapter 3).

Today, globalisation and the information-technology revolution are providing a fertile ground for businesses in developing countries to exploit economies of scale by utilising their comparative advantage of lower costs and, in the case of India, abundant labour. Also in India's favour is a potentially massive domestic market.

Just as important as sound physical infrastructure and a flexible labour market, however, are policies which foster competition so as to ensure that resources are allocated efficiently. The Deputy Governor of the RBI, Rakesh Mohan, draws a clear link between this favourable development and policy:

> "…micro structural reforms undertaken over the years have enabled continuing productivity gains, particularly in the manufacturing sector, with enhanced access of Indian business to technology, increased competition, greater attention to research and development and other productivity enhancing activities. Widening and deepening of the financial sector, along with improved regulation and supervision, has also contributed to improvement in productivity."[37]

In the following sections we highlight the main constraints to doing business in India which, if resolved, would help foster economies of scale and competition – two essential elements for sustaining high economic growth.

Creaking infrastructure

According to surveys, low quality and inadequate physical infrastructure are currently the major constraints on doing business in India. In its Annual Policy Statement for the Year FY08, the RBI warned that "infrastructure bottlenecks are emerging as the single most important constraint on the Indian economy". The government will shortly unveil its 11th Five-Year Economic Plan, spanning FY07 to FY12, and it has estimated about US$492bn needs to be spent over that period on improving the roads, railways, ports, power and water systems (Figure 56).[38] This is an enormous policy initiative which would raise infrastructure spending from its current 5% of GDP to 9% in FY12.

While fiscal policy is improving, the government will need to rely heavily on public-private partnerships to finance infrastructure development (see *Box 16: Financing India's infrastructure deficit*). Encouragingly, the pace of infrastructure development has recently picked up in some areas, notably roads, but as detailed below, India's power supply and railways remain a major constraint.

Power. Power capacity addition fell a disappointing 53% short of the target of the 9th Economic Plan (FY97-FY02) and 55% short in the 10th Plan (FY03-FY07). As a result, over the four years to FY05 real GDP has grown 16% more than power generation. Power outages cost Indian firms an estimated 8% in lost output per year, four times higher than in China (Purfield, 2006b). Indeed, outages are so common that large companies increasingly rely on their own electricity generators and captive power plants. This is a particularly common trend among many IT firms such as Infosys, Wipro and Geometric Software as it saves on the cost of frequent power cuts. On the domestic front, only 44% of rural households have access to electricity, which results in significant reliance on traditional energy sources, i.e. wood and animal dung, which are estimated to be the root cause of around 1m premature deaths each year as a result of smoke inhalation.

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[37] *See (Mohan, 2007)*

[38] *In May 2007, the Deepak Parekh Committee Report on infrastructure had estimated that US$475bn is required for infrastructure during the 11th (FY08-FY12) Economic Plan . Subsequently, The Planning Commission of the Indian Government published a consultation paper on 'Projections of Investment in Infrastructure during the Eleventh Plan' on 24 September 2007, which raised this estimate to US$492bn.*

Box 16: Financing India's infrastructure deficit

The success of Public-Private Partnerships (PPPs) is crucial for the development of India's infrastructure.

The Indian government estimates that investment of around US$492bn will be needed by FY12 to upgrade the country's creaking roads, ports and airports. To meet this target the government expects the private sector to contribute a share of about 30% by actively pursuing more innovative solutions including PPPs, a special purpose vehicle, and provision of viability gap funding.

PPPs involve long-term detailed contracts between the government and private firms, spelling out the rights and obligations of both parties. They offer significant advantages in terms of attracting private capital, accessing specialised expertise, sharing risk and lowering the cost of the provision of services to users. However, for private investors there can be significant uncertainty about whether the rewards of investing in infrastructure projects, which can span decades, will compensate them for the risk of partnering with state governments which frequently face election-related pressures during a period when (unrelated) anti-incumbency voting is becoming increasingly common.

In order to reassure potential private sector partners, the government is creating a standardised framework for PPPs, with a matrix of risk allocation obligations and returns. The Model Concession Agreement (MCAs) for PPPs in national highway projects is already in operation; and similar MCAs are being designed for other infrastructure projects. Also, to help streamline the appraisal process, a Public-Private Partnership Appraisal Committee (PPPAC) has been set up to review PPP proposals in a time-bound manner. As of 6 August 2007, 37 PPP proposals had been received from different central ministries for clearance by PPPAC, of which 28 had been approved.

Further to encourage PPPs, the government has set up a provision of viability gap funding, which normally takes the form of a capital grant at the stage of the project construction not exceeding 20% of the total project cost. However, in order to be eligible, the PPP must be implemented by an entity with at least 51% private equity. Additionally, in January 2006 the government set up a special purpose vehicle called the India Infrastructure Finance Company Limited (IIFCL) to help meet the long-term financing requirements of potential investors. The IIFCL is funded through long-term debt-raising from the open market and can provide financial assistance through direct lending to eligible projects, or through refinance to banks for loans with a period of five years or more. The government has also accepted the Deepak Parekh Committee's recommendation to use US$5bn of the RBI's FX reserves for India's infrastructure development. The proposal is to set up a monoline credit insurance company abroad, which will issue long-term foreign currency bonds, in which the RBI will be the sole investor, using its FX reserves. These funds will be invested in highly rated collateral securities, which will be used to provide a credit guarantee to Indian companies borrowing abroad to finance infrastructure-related capital imports.

As a result of the government's initiatives, a growing number of foreign and domestic private investors are raising private equity to invest in infrastructure development companies and projects in India. For example, 3i, a private equity firm based in the UK, has announced plans to raise US$5bn to invest in infrastructure and has highlighted India as an area of focus. Citigroup and private equity group Blackstone recently agreed to float a fund worth US$5bn with India's Infrastructure Development Finance Company (IDFC) and IIFCL. GE plans to create an infrastructure fund of US$300-500m, doubling that amount over time. The State Bank of India (SBI) Mutual Fund, a joint venture between SBI and Société Générale of France which manages around US$5bn, opened a dedicated infrastructure fund for subscription in May 2007. In September 2007, ICICI Bank announced plans to set up a US$2bn infrastructure fund.ÿ

The Ministry of Power has launched an initiative for the development of coal-based Ultra-Mega Power Projects, each with a capacity of MW4,000 or more. Coal, which is abundant domestically, will remain the dominant source of energy, notwithstanding increasing exploitation of offshore natural gas and (controversial) proposals to build gas pipelines from both Iran and Myanmar. There is also increasing recognition of the need for India to exploit more of its potential in renewables, especially hydro-electricity, as well as considerable emphasis on nuclear energy, especially in the field of fast breeder reactors, even though ministers concede that this is unlikely to supply more than 3% of India's electricity requirements. The efficient use of energy has become all the more urgent given the emerging challenge of climate change and adopting the clean development mechanism (see *Box 17: Climate change and India and Box 18: India and the clean development mechanism*).

However, the greatest weakness lies not in generation but on the distribution side, which is the domain of the state governments. Nearly half of the power generated in India is "lost" due to poor maintenance and operations, rampant electricity theft and corruption.

The Accelerated Power Development and Reform Programme, initiated in 2001, was expected to reduce aggregate technical and commercial losses of state power utilities to 15% by 2007: in fact, the average losses (including uncollected bills) for all states taken together remain around 40%.

The Government Planning Commission estimates that additional power generation capacity of MW70,000 is needed over the 11th plan (FY08-FY12), and that India needs US$150bn worth of investment in electricity over the next five years to meet this target.

Transportation. Poor roads, railways and ports result in long delays and higher transportation costs for Indian business – it takes 24 days for Indian exports to reach the United States, compared with only 15 days from China and 12 from Hong Kong (Winters and Mehta, 2003).

(i) Railways. Of the three transport modes, the biggest concern is railways. India has the world's second largest network under a single management, but its railways are saturated with freight and passenger traffic and urgently need more capacity. The total number of rail route kilometres has barely increased since FY01, while the average speed of an Indian container-carrying train is a mere 25kph. A new dedicated 1,469km freight line is under construction from Jawaharlal Nehru Port, near Mumbai, to Dadri, near Delhi. However, many more projects are needed to resolve the bottlenecks, as the government has recognised through the launch in January 2007 of public-private partnerships (PPPs) with 14 companies, aiming to increase containerised rail transport from around 21m tonnes per year currently to over 100mt by 2012. The Government Planning Commission estimates that over the 11th Plan, 10,300km of new railway lines are needed, and that India needs US$62bn worth of investment in railways over the next five years.

(ii) Roads. India has an extensive road network of 3.3m km, the second largest in the world, which carries 70% of the country's freight and 85% of the passenger traffic. The government is making progress in implementing the National Highways Development Project, the largest highway project ever undertaken by the country. The Golden Quadrilateral phase is almost complete. This connects the four major cities of Delhi, Mumbai, Chennai and Kolkata, and totals 5,846km of highway where average speeds on the better stretches are close to 100kph. Work is now under way on developing highways for the North-South (from Srinagar to Kanyakumari) and East-West (Silchar to Porbandar) corridors, upgrading existing highways with additional lanes, and improving port connectivity (Figure 57). The government has formulated a model concession agreement to facilitate the speedy award of contracts and has also announced several incentives, such as tax exemptions and duty free import of road building equipment, to encourage private sector participation.

Figure 56. Projections of infrastructure investment

Sectors	Anticipated investment in 10th Plan (FY02-FY07)	Projected investment in 11th Plan (FY07-FY12)	Growth
	US$bn		% y-o-y
Electricity	70.5	150.4	113
Roads & bridges	31.7	76.1	140
Telecom	22.5	65.1	190
Railways	20.3	62.2	207
Irrigation	32.1	53.1	65
Water & sanitation	15.6	48.6	212
Ports	1.3	18.0	1266
Airports	2.1	8.5	295
Storage	2.3	5.5	137
Gas	2.1	5.0	135
Total	**201**	**492**	**146**

Note: Projections are in rupees at FY07 prices and converted into US$ at INR/US$ of 41.0

Source: Government Planning Commission and Lehman Brothers.

Figure 57. The National Highway Development Project

	Number of kilometers, status as at August 31, 2007			
	Total length	Completed	Being implemented	Balance awaiting contract award
Golden Quadrilateral	5,846	5601	245	-
NS & EW Corridors	7,300	1418	4903	821+
Upgrading and extra lanes	10,500	126	2014	8360
Port connectivity	380	159	215	6
Other	962	322	620	20
Total	**24988**	**7626**	**7997**	**9207**

Source: National Highway Authority of India and Lehman Brothers.

Box 17: Climate change and India

Increasingly aware that India stands to be one of the countries most affected by climate change, its authorities are starting to shift their stance.

Climate change in India

According to the recent report by the Intergovernmental Panel on Climate Change (IPCC)[39], warming of the climate system is "unequivocal", and global average surface air warming will likely be between 1.8ºC and 4.0ºC by the end of the 21st century. Such warming will have climatological consequences: the IPCC judges it *very likely* (i.e. with a greater than 90% probability) that hot extremes, heat waves, and heavy precipitation events will become more frequent[40].

The impact on India may be especially significant, because its large population depends particularly heavily on climate-sensitive sectors, notably agriculture and forestry, for its livelihood. Furthermore, the Indian economy and its societal infrastructures are rather finely tuned to the remarkable stability of the monsoon[41]. Any small change in monsoon rainfall could therefore have a large impact on the economy. It is impossible, given the present state of knowledge, to predict exactly what these impacts will be, not least because global temperatures are set to enter uncharted territory. However, climate models are getting ever better, and the judgement of climatologists is that they now give good general indications. Principal implications include the following.

Temperature increases

India's increase in temperature is, in the judgement of the IPCC[42], *likely* (i.e. with a more than 66% probability) to be greater than the global mean increase. A study by the United Kingdom Department for Environment, Food and Rural Affairs (DEFRA)[43] projects temperature increases in India of as much as 3 to 4ºC towards the end of the century under two different socio-economic scenarios (see Figure 58). One of these gives priority to economic growth (A2 scenario), and the other of prioritises environmental issues (B2 scenario). As a result of these temperature increases, heat waves stand to be of longer duration.

Rainfalls and water resources

It is considered *very likely* (i.e. with a greater than 90% probability) that the frequency of intense precipitation events will increase in India (see Figure 58). The Godavari basin, in particular, is projected to experience higher precipitation than the regions of Krishna and Ganga. Most major river basins across the country are likely to become considerably dryer, which would lead to constant water shortages. In other regions, a marked rise in precipitation intensity, and variability in extremes, are expected to have impacts on a range of sectors, including agriculture, water resource management, and urban planning.

Moreover, melt-water from the Himalayan glaciers and snowfields currently supplies up to 85% of the dry season flow of the great rivers of the Northern Indian plain. This could be reduced to about 30% of its current contribution over the next fifty years, and have major implications for water management and irrigated crop production[44].

Sea level rise

One quarter of the Indian population lives on, and depends upon, the coast for its livelihood. Climate change effects on the level of the sea can impact low-lying areas in two ways: directly through the increase in average sea level; and through increased frequency and intensity of coastal surges and storms. Coastal zones are densely populated (455 inhabitants per km^2, which is about 1.5 times the national average). According to an Indian government report to the United Nations Framework Convention for Climate Change[45], a 1 meter sea level rise would force around 7.1 million people to displace. Sea level rise would also imply land losses, increased flooding in low-lying areas, and damage to coastal infrastructure.

Human health

The DEFRA report suggests that there will be an increase in temperature-related illnesses, vector-borne diseases, health impacts related to extreme weather events, and health effects due to food insecurity. According to the Indian government's report, malaria will move to higher latitudes and altitudes, with 10% more area offering climatic opportunities for the malaria vector to breed throughout the year during the 2080s, compared with 2000.

[39] *Intergovernmental Panel on Climate Change (2007), Summary for Policy Makers.*
[40] *Intergovernmental Panel on Climate Change (2007), Technical Summary.*
[41] *Over the past 100 years, the standard deviation of the seasonal mean monsoon rains has been close to +/- 10% for all India. See Challinor, A. et al. (2006).*
[42] *Intergovernmental Panel on Climate Change (2007), Regional Climate Projections.*
[43] *DEFRA (2004).*
[44] *Stern, N.* et al. *(2006), ch. 5.*
[45] *Government of India (2004).*

Should India take part in climate change policies?

A natural, and frequently posed, question is whether or not India should participate in climate change policies. This question is particularly debated on the international scene of climate change policy negotiations. For the moment, India has no binding commitment to reduce its greenhouse gas emissions, because of its developing-country status. However, India is already the world's 5th biggest emitter of greenhouse gases.[46]

For their part, India – and other developing countries – argue that they should not take part in climate change policies, on several grounds:

- First, because they have not contributed to past carbon emissions as much as developed countries have.
- Second, because they stand to be more affected by climate change. India, in particular, seems to be one of the most affected regions by a global mean temperature increase (see Figure 59).
- Third, because they cannot pay for adapting to climate change and abating future emissions.
- And last, because developed countries grew rich through a fossil-fuel – and carbon emitting – economic model of growth, and that it would be inequitable to prevent today's developing countries from following a similar path.

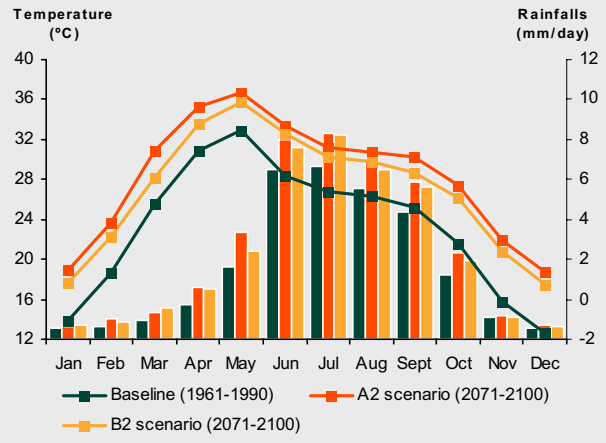
Indeed, this *equity* issue has been raised formally, in the Article 3 of the 1992 United Nations Framework Convention on Climate Change, which stipulates that "…the Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capacities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effect thereof."

On the other hand, developed countries argue that India should also take part in climate change policies, as it is ranking now among global top emitters, and because its part in global emissions will increase.

Our judgement is that, ethical considerations aside, India's authorities would be well advised to send a clear signal to the Indian people that India wishes to join in the growing world movement to curb greenhouse gas emissions, if only because this movement stands to offer great commercial opportunities to companies that produce the goods and services that stand to be in high demand.

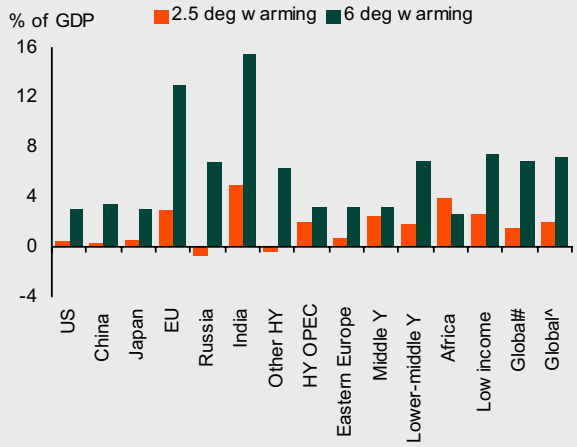
And indeed, well aware that India stands to be heavily affected by climate change, India's authorities have taken the first steps towards developing a national plan to tackle the effects of climate change. This new national plan, which is set to be announced this month, will almost certainly not include any commitment to cut carbon emissions, but more emphasis is likely to be placed on: energy efficiency; a greater use of renewables; improving air quality; and subsidising clean technologies and forestation. y

Figure 58. Mean annual cycles of all-India rainfall and temperature, baseline and simulated



Source: DEFRA (2004).

Figure 59. Estimated costs of 2.5ºC and 6ºC global warming



*HY = High Income; Y = Income

(output weights) and ^ (pop weights)

Source: Nordhaus, W.D., Boyer, J. (1999).

[46] *Energy Information Administration (2004), International Energy Annual 2004.*

Box 18: India and the clean development mechanism

Shifts in policy can help India gain significant rewards from deeper participation in global carbon markets.

The clean development mechanism (CDM), which came into force with the Kyoto Protocol in 2005, is a tool to help developed countries which have ratified Kyoto (known as "Annex 1" countries) achieve their emissions-reduction targets. The CDM allows Annex 1 countries to invest in emissions-reducing projects in developing countries, such as India. They can then use these reductions (certified emissions reductions or CERs) to meet their own emissions targets, e.g. as part of the European Union Emissions Trading Scheme (EU ETS). The CDM is subject to strict regulatory guidelines and is set to play a major role in the rapidly growing carbon markets. Through it, India and other developing countries can and already do play a prominent role in tackling climate change.

CDM credits can be used for compliance in the EU ETS from 2008. So far, India has attracted the largest number of projects of any participant and is second only to China in terms of credit volumes. India has great potential to reduce emissions thanks to continuing industrialisation and infrastructure development. Such development creates an opportunity to choose cleaner technologies to meet this demand which would not be possible without CDM finance (which includes funds to upgrade existing qualifying infrastructure). The sheer scope for development in Indian rural areas in particular and the size of the national market are a spur to technological innovation in these areas.

To date, India has tended to attract smaller-scale projects which generate smaller amounts of credits. Thus, there is significant potential to "bundle" smaller-scale projects with the benefit that the larger the project the less of a hurdle to development are transaction costs and consultancy fees. However, projects must continue to satisfy important CDM criteria, i.e. emissions must be additional, permanent, measurable and verifiable to ensure the credibility and marketability of emissions reduction credits.

Public and private sector decision-makers in India appreciated early on that the CDM was a significant opportunity for encouraging technology transfer from developed countries. Directed appropriately, CDM projects can also provide funding for sustainable development goals. Realising these benefits requires an appropriate regulatory and policy framework and a willingness to cooperate with the developed countries – key elements which we hope to see strengthened in the ongoing review of Indian climate change policy being conducted by Prime Minister Singh in the run-up to the December 2007 Bali climate change summit.

In addition to more familiar investment risks, the CDM can also bring its own uncertainties: Will the technology work? How many credits will be produced? What will the demand be in five years time? China has helped to decrease such risks by the following means:

- All projects must have an Annex 1 donor who endorses the project and ensures that credits reach a credit registry in the developed world; and,
- The Chinese government has high involvement on the sellers' side, enforcing the Chinese project developer's contractual commitments.

These measures increase buyer confidence in what will be long-term investments to gain future emissions reductions. Together, they have contributed to China attracting the highest volume of potential CDM credits (CERs) so far.

Without such guarantees, investors will look mainly to already-issued Indian CERs, for which the seller assumes all the risks. The volume of CERs issued so far is small and the transaction costs involved in purchasing them are likely to put off any significant investor interest. By introducing a more rigorous policy structure for the CDM, India would therefore stand to reap significant rewards for project developers, companies and local communities, as well as take a strong lead in addressing climate change internationally. y

At the state level, on 5 September 2007 Uttar Pradesh chief minister Mayawati announced an ambitious programme to build an eight-lane 1,000km expressway linking Noida (near New Delhi) and Ballia at the underdeveloped eastern edge of Uttar Pradesh. Running along the left bank of the Ganges, the proposed highway is being compared by its proponents to the Grand Trunk Road built along the right bank by Sher Shah Suri 500 years ago, which is often described as India's first highway. The aim is to start the project in January 2008 and complete it within three to five years, and for it to be built entirely by the private sector with the state acting as facilitator in land acquisition.

While there has therefore been some progress recently, major challenges remain including improving the quality of existing roads. For instance, the World Bank estimates that 82% of the homes in Chhattisgarh are not connected by road. Fewer than half of the roads are paved; so, with motor vehicle ownership now taking off, investing in road infrastructure remains a top priority. This is highlighted by the statistic that India has just 1% of the world's vehicles but 10% of global road fatalities.

Further progress on developing roads and highways will depend on how rapidly a range of constraints can be resolved. For new roads, the same sort of concerns apply as those already highlighted over land acquisition for SEZs: that poor rural households could be displaced without fair compensation for their loss of livelihood and property rights; that there could be a large-scale uprooting of farmers; and that land acquired at least purportedly for new roads could be diverted for other, speculative, uses. For existing highways, in many parts of rural India, in particular, maintenance is severely deficient – arguably in part because of India's rigid labour laws. Edward Luce cites the example of Uttar Pradesh, India's most populous state, where the highways department employs one worker for every two kilometres of road, "among the highest ratios in the world".[47] Luce continues: "…many of them do not bother to turn up for work because they cannot be sacked; and any attempt to offer voluntary redundancy to public sector workers prompts an outcry about abuse of workers rights…. But even if the road gangs did regularly report for duty, the [state] government…would still be unable to equip them with enough tools and material for the job…because it spends most of its road budget on salaries. The employees of Uttar Pradesh's highways department are paid more than three times the market's going rate."[48]

(iii) Aviation. India's civil aviation sector is one of the fastest growing in the world. Domestic air passenger traffic increased by 39% in FY07, while total passenger traffic (including that of international routes) rose by 31%. K.V. Kamath, CEO of ICICI Bank, India's largest private lender, summed up the predicament of India's airports thus:

> "You have the peculiar problem where the infrastructure on the ground is not fully in place, but the infrastructure in the air is there in terms of flights."

The Centre for Asia-Pacific Aviation, a consultancy, predicts that domestic traffic will grow 25-30% per year until 2010, and international traffic by 15%, increasing the overall size of the market to more than 100m passengers annually.

Capacity constraints at the major airports in Delhi and Mumbai are already causing restrictions to be imposed on the number of flights which domestic airlines can operate during peak hours. In response, in co-operation with the private sector, the government is planning to invest US$9bn by 2010. It has awarded contracts to two private sector consortia to redevelop Delhi and Mumbai airports during that period. The airports of Chennai, Kolkata, Bangalore and Hyderabad have been earmarked to be modernised along similar lines, as have 35 non-metropolitan airports. A major fleet acquisition is also under way: Indian carriers currently have a total fleet size of just 310 aircraft, but have a further 480 on order for delivery by 2012. Furthermore, several new private sector airlines have been granted licenses.

[47] *See* The Future of India *by Bimal Jalan (2005), pp107-8.*
[48] *See* In Spite of the Gods: The Strange Rise of Modern India *by Edward Luce (2006) pp88-9.*

(iv) Ports. India has 12 major and 185 minor ports along its 7,517 km of coastline. They are heavily congested, with an average turnaround time of 3.5 days, compared with 10 hours for Hong Kong. The government plans to add 76 berths at India's major ports over the coming five years, mainly through public-private partnerships. The Government Planning Commission reckons that developing India's ports will require additional investment of US$18bn over the next five years.

As noted above, poor connectivity to ports is a major problem, especially in a country where only 38% of the population lives within 100km of the coast or sea-navigable waterways. In an attempt to mitigate this situation, the government plans to build three new ports as part of a large industrial zone which would span five states (Uttar Pradesh, Haryana, Rajasthan, Gujarat and Maharashtra) along the Delhi-Mumbai Industrial Corridor. Over the 11th Plan the Government Planning Commission projects that India will need additional capacity of MT 485m in major ports, and MT 345m in minor ports.

Telecommunications. The telecom sector has been India's biggest success story in infrastructure reform, thanks largely to government deregulation. The success of soaring demand can be judged from that fact that Nokia built a huge factory near Chennai in just five months in 2006. Telecom tariffs, which were among the highest in the world less than four years ago, have now dipped to among the lowest. The total number of phone subscribers has increased from 55m in March 2003 to 241m in August 2007 – a tele-density of 21.2% – with the Government Planning Commission projecting 600m by FY12 (of which 90% are likely to be wireless connections). The bulk of the growth needs to come from the rural areas, where tele-density remains low. The Telecom Regulatory Authority of India estimates that India will require about 330,000 mobile phone towers by 2010, more than three times the current count of 100,000.

Reels of red tape

There has been some progress made with deregulation at the centre. But "license raj" and a more pervasive "inspector raj" still survive, especially in many of the states. Companies in India spend significant amounts of time and money dealing with permits, clearances and inspections, which encourages entrepreneurs to pay "rents" to the inspectors for speedier processing. To capture this point, the *Economist* vividly depicts the journey of a lorry from Kolkata to Mumbai:[49] it only arrives in Mumbai in the morning of the eighth day, having achieved an average speed of 11km/h and spending 32 hours waiting at toll-booths and checkpoints between states as well as within states.

Not surprisingly, in the World Bank's 2007 survey of 178 countries on the "ease of doing business", India ranked 120, slightly better than a ranking of 132 in the 2006 survey, but still leaving it in the bottom quartile (Figure 60). India fares relatively well in protecting investors and in the ease of getting credit, and there has been a significant improvement in the ease of trading across borders. However, in nearly all other indicators India ranks in the bottom half. For ease of comparison, of the 178 countries surveyed by the World Bank we have extracted the results for the world's large developing economies and set them out in Figure 61.

According to the World Bank survey, India is one of the worst in the world when it comes to enforcing contracts, ranking 177th with only Timor-Leste having a worse record. Even though the rule of law is well established in India, the country experiences a huge backlog in cases. Currently, 28-29m legal cases are pending in India's courts; and enforcing contracts takes an average 1,420 days to complete, with 46 different steps – scarcely any improvement from four years ago.

India also fares poorly dealing with licences, with its world ranking of 134 making it the fifth worst of the major developing economies. To build a warehouse in the city of Mumbai takes over 200 days and involves 20 different procedures. Furthermore, it takes an estimated 40 days for a business in Mumbai to apply for a permanent power connection; and about 60 days for water and sewage.

For all that, the World Bank survey reveals that it is easier to start a business in India than it is to close one. As regards setting up, India is now close to the median ranking, the time taken having dropped from 89 days in 2003 to 33 in 2007. On the other hand, closing a business in India takes an average of ten years, ranking the country as the 137th worst in the world, with only the Philippines of the other major developing economies, having a poorer record. Moreover – and likely not unrelated – the recovery rate for closing a business is just 12 cents in the dollar.

Figure 60. Ease of doing business in India*

	2007 rank	2006 rank	Change in rank
Doing business	**120**	**132**	**12**
Starting a business	111	93	-18
Dealing with licenses	134	133	-1
Employing workers	85	83	-2
Registering property	112	108	-4
Getting credit	36	62	26
Protecting investors	33	32	-1
Paying taxes	165	158	-7
Trading across borders	79	142	63
Enforcing contracts	177	177	0
Closing a business	137	135	-2

* The ranking is of 178 countries surveyed by the World Bank, where the lower the ranking the easier it is to do business in the respective country.

Source: World Bank's Ease of Doing Business database and Lehman Brothers.

Figure 61. Business ease in India vs elsewhere in 2007*

Enforcing contracts		Dealing with licenses		Starting a business		Closing a business	
Hungary	12	Thailand	12	Thailand	36	Mexico	23
Russia	19	Mexico	21	Turkey	43	Thailand	44
China	20	South Africa	45	Russia	50	Hungary	53
Thailand	26	Philippines	77	South Africa	53	Malaysia	54
Turkey	34	Hungary	87	Hungary	67	China	57
Argentina	47	Indonesia	99	Malaysia	74	Argentina	65
Malaysia	63	Malaysia	105	Mexico	75	South Africa	68
Poland	68	Brazil	107	**India**	**111**	Russia	80
Mexico	83	Turkey	128	Argentina	114	Poland	88
South Africa	85	**India**	**134**	Brazil	122	Turkey	112
Brazil	106	Poland	156	Poland	129	Brazil	131
Philippines	113	Argentina	165	China	135	Indonesia	136
Indonesia	141	China	175	Philippines	144	**India**	**137**
India	**177**	Russia	177	Indonesia	168	Philippines	147

* Of 178 countries surveyed by the World Bank, we extracted the key developing economies. The lower the ranking, the easier it is to do business in the respective country.

Source: World Bank's Ease of Doing Business database and Lehman Brothers.

[49] *See* Economist *(2006).*

The adverse impact of such regulations on small and medium-sized enterprises (SMEs) is particularly burdensome, given that they are less well equipped to deal with the complex requirements. This is a major concern, not only because SMEs are the breeding ground for technology innovations, but also because it constrains their ability to grow and achieve economies of scale.

Taxing taxes

The World Bank's "ease of doing business" survey also shows the administrative burden India's tax system places on business. A medium-size company in Mumbai must make a total of 60 different payments in taxes, duties and charges per year, the paperwork taking an average of 271 hours to process.

The taxes include: corporate income tax; social securities payments; fuel tax; value-added (state) tax; employees' state insurance contribution; property tax; dividend tax; Maharashtra sales tax; interest tax; insurance contract tax; vehicle tax; and stamp duty. Recently there have been reforms – including broadening the corporate income tax base, introducing a state-level value-added tax and eliminating the tax on inter-state trade central sales tax (CST). But India's competitiveness remains compromised by the complexities and distortions in its tax system.

The corporate tax rate (including surcharges) is relatively high at 33.7%. Adding in all the other taxes and charges, the overall burden on the average Indian company amounts to 71% of profits, at least in principle (Figure 62). In practice, this explains why India's taxation system is littered with exemptions, tax holidays, poorly targeted subsidies and widespread tax evasion.

The tax system also introduces distortions which discourage businesses from growing. For example, excise taxes are fully exempt up to a certain level of sales, but become fully payable (including on the exempt amount) once sales exceed the exemption limit.[50] This represents yet another constraint on firms achieving economies of scale.

The Fiscal Responsibility and Budget Management Act road map recommends: lowering the personal and corporate tax rates; eliminating most exemptions; and introducing a national goods and services tax, together with accelerating tax administration reform. Cutting the corporate tax rate and shifting the burden of indirect taxation from manufacturing to consumption would enhance India's attractiveness as an investment destination, as well as its export competitiveness.

Laggard labour reforms

India's labour laws protect a minority of workers in the organised sector at the expense of the majority, a paradoxical situation for a poor country with surplus unskilled labour specialising in skill- and capital-intensive sectors. However, the impact of these laws has recently diminished, as enforcement has slackened in some states.

In the Indian constitution, there are 45 Central Acts and 16 associated rules which deal directly with labour. Arguably, the law which has the greatest impact on business is Chapter 5B of the 1947 Industrial Disputes Act which bars manufacturing companies with more than 100 employees from firing workers without receiving permission from the state government. It is this law which underpins India's very high score of 70 on the World Bank's "difficulty of firing" index (which assumes full compliance with the relevant laws), the highest among large developing economies (Figure 63).

This lack of flexibility can hurt business. Employers whose business is seasonal, for example textiles, are reluctant to add extra staff during peak seasons because they cannot be laid off during lulls. This is one of the primary reasons for lack of scale economies in the textiles sector among others.

[50] *See Government of India's Planning Commission (2006), p.77.*

However, the clause requiring an employer to seek state permission before dismissing workers also says that if the state does not revert within 60 days permission is assumed to have been granted. In practice, this is often the case. Furthermore, "voluntary retirement" or "voluntary exit" agreements are becoming more common between employers and employees – a prime example of the ability of the private sector to work around the structural and systemic challenges it faces.

Another provision of the labour laws discourages factories from having shifts longer than eight hours (otherwise compulsory overtime rates must be paid) even if it is in the interest of workers to work longer hours for fewer days, because of long commutes, for example. Many firms are now moving towards contract labour to get around this issue (although this is permitted only in "non-core" areas).

Even though there is not full enforcement, and companies can often find loopholes, the labour laws are part of the reason for the polarisation of India's labour market. The organised, or formal, sector in India comprises businesses which are required to register officially as companies, either because they have electricity and employ more than ten workers or because they employ more than 20 workers. A telling statistic is that India's formal sector comprised 27m workers in FY05 amounting to just 7% of the total workforce. Furthermore, that share is declining. The reason: companies with ten or more workers must be registered under the Factories Act and, accordingly, must file tax returns and other official documentation, as well as being subject to official inspections related to the labour laws.

Additional perverse impacts of the labour laws include discouraging companies from growing their workforces to achieve the enhanced efficiencies associated with economies of scale and encouraging capital-intensive manufacturing, despite India's abundant cheap labour. As Jean-Philippe Cotis, the Chief Economist of OECD warns, "In India, the existing combination of greater competition and unchanged labour regulation is probably not sustainable. Indeed, it is putting pressure on many large employers to expand output through capital investment and reduce employment wherever possible, pushing jobs into the less productive informal sector." Furthermore, for large companies with over 100 workers strict employment protection can limit their ability to innovate, for example by restructuring or making strategic changes to their business model.

Figure 62. Details of doing business in India in 2007

	2003	2004	2005	2006	2007
Enforcing contracts					
Procedures (number)	46	46	46	46	46
Time (days)	1440	1420	1420	1420	1420
Dealing with licenses					
Procedures (number)			20	20	20
Time (days)			224	224	224
Starting a business					
Procedures (number)	11	11	11	11	13
Time (days)	89	89	71	35	33
Closing a business					
Time (years)	10	10	10	10	10
Paying taxes					
Payment (number)			59	59	60
Time (hours)			264	264	271
Total tax rate (% profit)			72	72	71

Source: World Bank's Ease of Doing Business database and Lehman Brothers.

Figure 63. Job markets in India vs elsewhere in 2007*

Difficulty of firing index		Rigidity of employment index		Firing costs weeks of wages	
Brazil	0	Malaysia	10	Poland	13
Thailand	0	Thailand	18	Russia	17
Hungary	10	China	24	South Africa	24
Argentina	20	Hungary	30	Hungary	35
Malaysia	30	**India**	**30**	Brazil	37
Philippines	30	Philippines	35	Mexico	52
South Africa	30	Poland	37	Thailand	54
Turkey	30	Argentina	41	**India**	**56**
China	40	South Africa	42	Malaysia	75
Poland	40	Turkey	42	China	91
Russia	40	Indonesia	44	Philippines	91
Indonesia	60	Russia	44	Turkey	95
India	**70**	Brazil	46	Indonesia	108
Mexico	70	Mexico	48	Argentina	139

* Of 178 countries surveyed by the World Bank, we extracted the key developing economies. The lower the ranking, the easier it is to do business in the respective country.

Source: World Bank's Ease of Doing Business database and Lehman Brothers.

The evidence

There is powerful international evidence that economic reforms and policies which foster competition and economies of scale can significantly boost productivity, employment opportunities and potential economic growth (OECD, 2002; Gwartney and Lawson, 1997; Djankov and others, 2006). Across India, thanks to the high degree of autonomy enjoyed by individual states, there has been wide variation in economic reforms which allows analysts to explore, on a sub-national scale, whether policies which promote economies of scale and competition make an economic difference. Several empirical studies, including our own, suggest that they do (*Box 19: The state of India's states*).

Box 19: The state of India's states

Empirical studies show that economic reform matters in explaining the growing economic disparities across states.

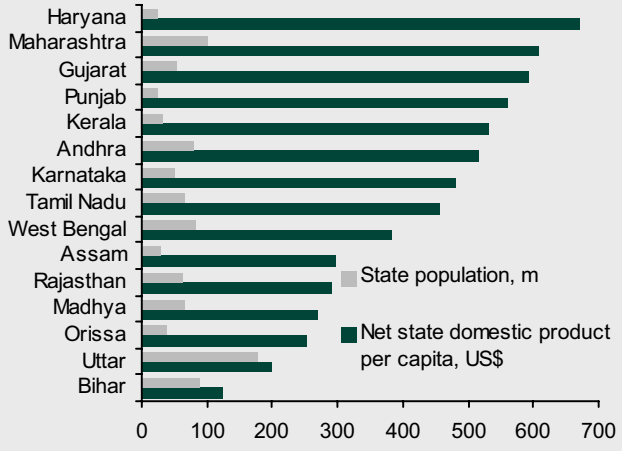
Although India as a whole has improved its performance considerably over the past two decades, disparity across the states is large and growing. The five poorest states, with 40% of the population, produce only one-quarter of total output. By contrast, the richest five states, with only about a quarter of India's population, produce over 40% of total output (Figure 64). Given that India's poorest states are also among the most populous, one major concern – not least for the authorities in India – is that unless these states begin to share in the benefits of growth, an increasing proportion of the population will be left in poverty and be subject to rising income inequality, leading to social, political, and economic difficulties (see "Populism versus progress" in the next section). These concerns gain yet greater traction when it is recognised that about 60% of the forecast 620m increase in the Indian population between now and 2051 is expected to occur in four of its poorer states, i.e. Bihar, Uttar Pradesh, Madhya Pradesh and Rajasthan (Visaria and Visaria, 2003).

Examination of the varying economic reforms and policies across India's states, which have significant autonomy in this respect, suggests that they can make an important difference to economic performance:

- States with more rigid labour laws experienced slower growth of output, employment and productivity in the formal manufacturing sector, as well as increases in urban poverty – Besley (2004).
- States which have amended land laws to encourage redistribution of land to labourers and the amalgamation of farms into viable units experienced higher investment, productivity and output growth – Banerjee and Iyer (2005).
- States with weaker institutions and poorer infrastructure experienced lower GDP growth, particularly in electricity- and infrastructure-intensive sectors – Kochhar and others (2006).
- States with better infrastructure apparently grow faster: in particular, rising transmission and distributional losses in the electricity sector adversely affect a state's growth performance – Purfield (2006a).

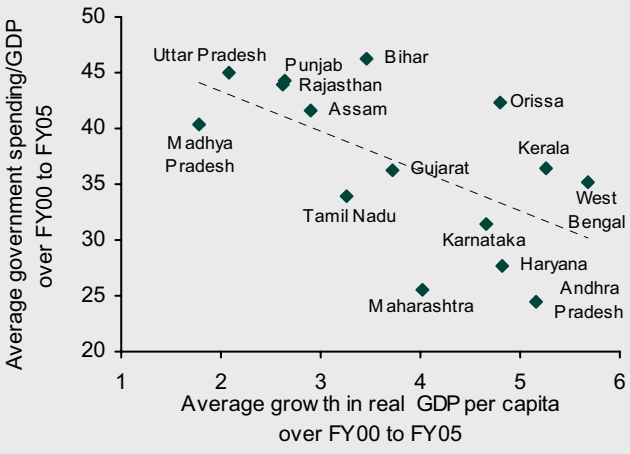
To add to this list, for the period FY00 to FY05 we examined the relationship between state economic performance (measured as the growth in net state real domestic product per capita) and the size of government (measured as the share of state government spending in state GDP). A scatter plot of these two variables shows a strong negative relationship (Figure 65), consistent with the view that excessive bureaucracy and state-owned enterprises are detrimental to growth. The "line of best fit" to this scatter has an R-squared of 0.41%; and the coefficient on the size of government variable is -0.1, statistically significant at the 1% probability level. Taking these results at face value suggests that a 10pp reduction in the share of state government spending in state GDP – for example, through reduced bureaucracy or privatisation – could boost the annual growth in net state real domestic product per capita by fully 1pp. The incentive to reform is likely to intensify among India's states as competition increases, labour migrates and capital is mobilised to the better performing states.

Figure 64. State nominal net domestic product per capita and population size as at FY05



Source: RBI, CEIC and Lehman Brothers.

Figure 65. Growth in state net domestic product per capita vs size of state governments, FY00 to FY05



Source: CEIC and Lehman Brothers.

GROWTH AND GOVERNANCE: THE POLITICAL CHALLENGE

> *"…The government needs to do all it can to encourage private enterprise. Indians are born entrepreneurs. They will respond to an environment which is conducive to this talent. Public policy needs to close the perennial debate on equity versus growth. State intervention in favour of the poor is needed in India, but realism requires us to distinguish between the desirable and the feasible... The only economic model that can work in India is a percolation of benefits consequent to an increase in the size of the pie. Since the poor are far too many, the pie needs to grow faster... A growth rate of 8 per cent or more is feasible provided the process of economic reform is sustained and business is left to entrepreneurs."* ***Pavan K Varma (2004)***[51]

In the preceding pages, we have set out the economics underpinning our view that not only is 9% sustainable but also that India's potential growth could be boosted further to 10% or so given the "right" policy measures. But the implementation of those policy measures should not be taken for granted; rather it is inextricably intertwined with India's politics. Alongside the economics, we therefore need to consider the political challenges which India's policymakers face, be it at the national (*Box 20: The structure of central government*), state (*Box 22: The centre and the states*) or city level.[52]

The difficulties with democracy

The maintenance of democracy since independence is frequently cited as one of India's greatest achievements of recent years – and rightly so.[53] However, as the distinguished Indian political scientist Professor Sudipta Kaviraj observed more than a decade ago:

> "…democratic government functioned smoothly in the early years after 1947 precisely because it was not taking place in a democratic society: as democratic society has slowly emerged, with the spread of a real sense of political equality, it has made the functioning of democratic government more difficult".[54]

The consequence of this is that successive Indian governments are finding themselves confronted with a challenge which is all too familiar to democracies worldwide: significant structural reforms inevitably involve "losers", at least in the short term, as well as "winners". Reform, in the face of popular resistance and vested interest, is hard.

For India, this difficulty is compounded by the additional challenge of coalition government – especially when that coalition is drawn from a wide range of the political spectrum.

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[51] Being Indian *by Pavan K Varma (Arrow Books, 2006) pages 190-1.*

[52] *In practice, Delhi is currently the only city in India which enjoys governance independent of that of the city's host state. See also Box 20.*

[53] *The one period when Indian democracy seemed genuinely threatened was from 1975 to 1977 after the then prime minister Indira Gandhi was found guilty of electoral fraud; she was ordered by the high court of Allahabad to be removed from her parliamentary seat and banned from running for elected office for six years. Public demonstrations supporting her removal caused Mrs Gandhi to advise the then president – a longtime political ally – to declare a state of emergency. Mrs Gandhi then used the extraordinary powers she assumed to rule largely by presidential decree and without recourse to parliament.*
Emergency rule lasted 19 months during which India made significant economic progress, thanks mainly to the banning of strike action and the repression of unions. Agricultural and industrial productivity increased; the administration was streamlined; tax evasion was reduced although corruption remained endemic. These economic gains may have contributed to Mrs Gandhi's decision to call an election in 1977 when, in a surprise result, she was heavily defeated effectively ending the INC's dominance of India's central government – see also footnote 56 .

[54] Dilemmas Of Democratic Development In India *by Professor Sudipta Kaviraj p119 (1996).*

Box 20: The structure of central government

India's robust constitutional federal democracy revolves primarily around its elected parliament.

The Republic of India is a constitutional federal democracy made up of 29 states (including the city of Delhi) and six federally governed union territories.

The role of head of state is filled by a president, currently Pratibha Patil, who is elected indirectly for a five-year term by members of the central and state assemblies, historically by consensus among the main parties. Mrs Patil, India's first woman president, was sworn in on 25 July 2007 despite being opposed by the main opposition Bharatiya Janata Party (BJP).

The executive is headed by a prime minister, currently Dr Manmohan Singh of the Indian National Congress (INC), who presides over a Council of Ministers chosen from elected members of parliament.

Parliament is bicameral.

The upper house – the Rajya Sabha – has 245 members, 233 of whom are elected by weighted votes of the elected members of parliament and the legislative assemblies of states and union territories, with 12 appointed by the president. Elected members sit for a six-year term with one-third retiring every two years.

The lower house – the Lok Sabha – comprises 545 members, 543 of whom are elected from single-seat constituencies under a first-past-the-post system, with (a relic from the past) two representatives of Anglo-Indians appointed by the president. 79 seats are reserved for the scheduled castes and 40 for the scheduled tribes. The maximum term is five years (with the next general election due no later than May 2009).

Representation in parliament remains frozen on the basis of the 1971 census. Already contentious, if the recommendation of the National Population Council to extend the freeze until 2026 is confirmed this could become a source of major tension between the north, where population growth is significantly higher, and the south of the country.

Given the size of the electorate – currently around 670m (i.e. over twice the size of the electorate for the European Parliament, which is the second largest globally) – general elections (and, indeed, large state elections, such as in Uttar Pradesh in May 2007 are conducted in a number of phases, usually over a period of about one month (see *Box 23: The Uttar Pradesh election and its national implications*).

The current – 14th – Lok Sabha was elected between 20 April and 10 May 2004. In a surprise outcome, the INC emerged as the largest single party with 145 seats (26.53% of the vote), thereby winning from the incumbent BJP – with 138 seats and 22.16% of the vote – the right to form the next government. However, the INC was only able to do so under the banner of the United Progressive Alliance (UPA) with the support of 11 other parties which won seats in the house, and, even then, only as a minority government controlling a total of 217 seats and supported "from outside" by the Left Front (which won 60 seats). The BJP and its allies won a total of 185 seats.

See also Box 22 below for an explanation of the relationship between central government and the state authorities, which also exhibits some important differences between principle and practice. ƴ

One of the practical implications of this, which will almost certainly affect India's ability to grow, can be extrapolated from one of the targets proposed by India's Planning Commission in its approach paper to the 11th Five-Year Plan published early in 2007. To support a GDP growth target of 9% per annum over FY08-FY12, the Commission proposes that infrastructure expenditure should rise to 9% of GDP per annum from just 5.0% now. It notes: "Our roads, railways, ports, airports, communication and above all power supply are not comparable to those prevalent in our competitor countries. This gap must be filled in the next 5-10 years if our enterprises are to compete effectively. Indian [companies] no longer expect protection. But they do expect a level playing field."

The government is hoping that around 30% of the US$492bn estimated investment this would require will come from the private sector. But despite recent impressive profits, it is not yet clear whether business can raise the sort of sums involved given India's still fledgling corporate debt market. And, whether or not the corporate debt market can develop hinges to a large extent on pension reform, which is effectively blocked in parliament by the communists on whom the current INC-led minority government depends for its survival.

Box 21: Economic growth and the law

The Supreme Court is pressing for the practice of law in India to match the country's impressive legal framework.

One of India's many strengths is its impressive legal framework. But the legal system as a whole has left itself open to criticism over the years. For example, in 2004 the Indian social commentator and former diplomat Pavan K Varma wrote that India had: "…one of the world's largest corpuses of high-minded laws, and one of the poorest records of implementation". And in a paper published the following year Dr Pranab Bardhan commented: "To this day [the rule of law] is a rather alien concept in much of Indian political culture… The law as actually enforced is often not above elected politicians".

However, more recent criticism arguably offers a more encouraging perspective. In December 2006, a number of parliamentarians did the legal system something of a service by highlighting, through public criticism, the courts' increasing propensity to "overstep" their "proper" constitutional role through the passing of executive orders. And in September 2007, commenting on a land dispute which had been stuck in the Indian legal system since 1957, a Supreme Court panel comprising Justices A.K. Mathur and Markandey Katju said: "People in India are simply disgusted with this state of affairs and are fast losing faith in the judiciary because of the inordinate delay in the disposal of cases".

Such comments – in particular, the pointed warning of the Supreme Court panel – underscore the fact that at least some of India's judges are prepared not only to speak out in their efforts to get India's courts up to speed with the demands of a modernising economy, but also to use the law to make politicians and bureaucrats do their job where otherwise the executive has failed to deliver. Combined with a number of recent high-profile cases – perhaps most notably the conviction for murder in November 2006 of the then cabinet minister Shibu Soren, now serving a life sentence – there is a growing sense that India's higher courts at least are a force for good.

In a December 2006 FT.com article on this phenomenon, the distinguished editor and publisher T.N. Ninan cited a number of examples of where the courts could intervene to the public good, including the following: "An infrastructure project in Mumbai needs clearance from no fewer than 13 state government departments, many of them presided over by ministers from rural constituencies who do not understand the urgency of having a properly functioning metropolis. How then can despairing Mumbai-ites find solutions to their many problems? Delhi didn't, till the courts stepped in. Do they now have to do the same thing in Mumbai?"

As in most developing economies, compounding the overloading of the legal system is the problem of corruption in some parts of it. According to a 2005 survey by the Centre for Media Studies (an independent not-for-profit development research and facilitation organisation) about US$580m changes hands in bribes related to legal cases in every 12-month period.

In addition to the efforts of the Supreme Court, the current government has tried to improve the situation. A potentially important legislative reform is the Right to Information Act 2005 (RTI). This is the first national law to come into force addressing disclosure of government information since 1923 and a significant step towards enshrining in law a 1975 Supreme Court ruling that "the people… have a right to know every public act, everything that is done in a public way, by their public functionaries" (note: the highly criticised 2002 Freedom of Information Act never came into effective force). Despite extensive parliamentary amendment to the original draft of the bill, the RTI is far-reaching in its impact, as is underlined by the filing of over 40,000 applications under it in its first year of existence – and, arguably, highlighted further by parliamentary attempts to amend the law in 2006 which were abandoned in the face of a public outcry. In addition to the help it offers to ordinary citizens, there is already evidence that its existence alone is acting as a stay on corruption on contracts for major public works.

There is, nevertheless, a major economic cost associated with the slowness with which the wheels of justice can turn in India (hardly a new problem in India – it stretches back to the pre-colonial period and British rule did little if anything to alleviate the situation). Some innovative measures – especially the prioritisation of so-called "public interest litigations" (PILs) and, more recently, the promotion of mediation for civil suits – help to expedite some cases. But the backlog still amounted to about 26m in 2006 when an estimated US$75bn (roughly 10% of Indian GDP) was tied up in legal disputes – an issue which the then US Treasury Secretary John Snow (speaking in 2005), among others, has cited as a potential barrier to investment including in critical sectors such as infrastructure. ƴ

This is, unfortunately, not an isolated example. After INC's surprise victory in the 2004 general election, the Left Front (which is dominated by the communists) decided not to join the INC-led United Progressive Alliance (UPA) but to support it from "the outside". Although the Front has subsequently been accommodating on some issues, notably foreign investment, it has continued to oppose many reforms put forward by the government, especially those relating to deregulation of the labour market and privatisations. In 2005, it boycotted coordination meetings with the UPA for four months until the government abandoned a reform package. And, if anything, it has become even more assertive since the communists secured landslide victories in state elections in West Bengal and Kerala in the first half of 2006. For the duration of this parliament it is now likely to block any reform that requires new legislation (this highlights the contrast between the communists at the national level, who enjoy leverage without responsibility, and those at the state level whose administrations are pushing through reform). Indeed, at the time of going to print the communists were continuing to threaten to withdraw their support for the government were it to press ahead with ratification of a benchmark agreement with the United States on civil nuclear technology, a dispute which some experts judge may even precipitate an early general election (see Box 26: The economy and international relations).

There is nothing particularly remarkable about this. The general pattern in democracies worldwide is that governments find it easier to push through reforms – and other potentially controversial legislation – earlier in their term of office; thus reform tends to tail off towards the latter part of the election cycle. At this stage in the cycle, we would expect any reform-minded democratically elected government to be concentrating on measures that can be brought in without potentially contentious legislation having to be passed in parliament.

Box 22: The centre and the states

The trend of recent years had been for power to shift from Delhi to the states – but not to the city authorities.

The Indian constitution defines the division of most powers between the centre and the states, with the centre having precedence over residual issues.

In principle, central government can exercise considerable power over the state authorities through its significantly greater ability to raise revenue, in particular through taxing income, production and international trade. Furthermore, the states cannot borrow without central government permission.

However, the period since 1977 has seen the emergence of numerous caste- and regionally-based parties which grew out of the opposition movement to then prime minister Indira Gandhi's state of emergency (see footnote 56). As these parties have become increasingly successful in state and national elections, central government has become increasingly reliant on regional allies and has found it harder to resist state demands to manage their own finances.

Furthermore, as central government's control of industry, finance and foreign trade has gradually been relaxed over the past decade in particular, competitive pressures have grown among the states which have sought to attract and retain business investment. The most successful states in this regard have tended to be those in the south and west of the country.

With the notable exception of Delhi, which enjoys significant governmental autonomy, any loosening of the reins by central government has tended to devolve power to the state authorities rather than the major cities. As a *Financial Times* leader published on 9 October 2006 argued: "Central government should bolster [conditions which favour 'commercial enterprise'] by decentralising more decision-making and by giving more power to the larger cities to run their affairs. As the source of most of India's wealth generation, their prosperity holds the key to its future development." ƴ

A window in 2009?

Optimistically, we look for a new window for economic reform after the next general election, which must be held no later than May 2009.

However, the days when the INC could reasonably expect to command a majority in parliament – as was the case more or less continuously from 1950 to 1990 – appear to be gone forever. The main opposition Bharatiya Janata Party (BJP) from 1997 to 2002 became the first party other than the INC to head a democratically elected Indian government for a full five-year term. Neither it nor the INC looks likely to be able to secure much more than 25% of the total vote in future general elections.[55] Thus, whichever of India's two main parties emerges as the larger after the next election, it will be obliged to cut – probably complex – deals with myriad smaller parties in order to be able to form a stable government.

Increasingly, there appears to be a propensity of Indians to vote on a caste and/or vested interest basis. There is also an emergence at the national and, more especially, at the state level of politics a predilection for anti-incumbency "revolving door" politics where no party holds power for more than one term before it is ejected by the electorate (see, for example, *Box 23: The Uttar Pradesh election – its national implications*). Neither is conducive to rapid reform.

Realistically, therefore, we expect the pace of reform to continue to be measured at the national level irrespective of the outcome of the next general election. We acknowledge though that at the sub-national level some parts of the country will continue to move forward more quickly than others – sometimes, as communist-governed West Bengal is demonstrating, irrespective of the political hue of the administration.

[55] *For three decades after independence, Indian general elections were dominated by the INC party which also won most state elections in the 1950s and 1960s. This pattern changed in the aftermath of the 1975-77 state of emergency, when INC prime minister Indira Gandhi was roundly defeated by the Janata Party as her party lost all but 200 seats relative to the previous (1971) election. One of the underlying causes of Mrs Gandhi's original decision to call a state of emergency had been accusations of authoritarianism, including erosion of state powers under the constitution.*
Janata itself was a somewhat disparate coalition which fractured during its three years in office and disintegrated completely after the 1980 general election when INC was returned to power. The modern BJP is one of the parties which emerged from the wreckage of Janata.
To a significant extent, history repeated itself in 1989 when Congress – now under the leadership of Rajiv Gandhi – was narrowly defeated by the Janata Dal coalition, another successor to Janata which enjoyed the outside support of the BJP while it was in office. Congress managed to win back power in 1991. But the increasingly fissiparous nature of Indian politics since 1977 had by this time created a new – and still prevailing - paradigm whereby, since 1992, none of the three truly national parties in India (i.e. the BJP, the Communist Party of India (Marxist) and the INC) has been able to command a parliamentary majority and India has been ruled by successive coalition governments.

Box 23: The Uttar Pradesh election – its national implications

A surprise2007 state election result in Uttar Pradesh may be a pointer for future national voting patterns.

Despite its surprise result, the May 2007 state election in Uttar Pradesh (UP), India's most populous state (with an estimated 175m people, UP would qualify as the world's sixth most populous country) and often viewed as a microcosm of India as a whole, should offer some useful pointers for both the next general election and Indian national politics more generally.

The surprise was the winning of an outright majority (206 out of 403 seats) by the Bahujan Samaj Party (BSP), making the new administration in UP the first since 1991 that has not needed a coalition. Underpinning this success was the decision by BSP – a left-leaning party with strong roots in UP and which has chiefly represented Dalits – to form tactical alliances with both Muslims and upper-caste Hindus (including fielding almost 90 Brahmin candidates), a move which could prove to be a boost for UP.

Not surprising were (a) the ejection from government of the incumbent Samajwadi Party-led coalition, further confirming the established pattern of "revolving door" politics (it is worth noting that BSP leader Mayawati has herself been chief minister in UP on three previous occasions so it remains to be seen whether she has indeed definitively broken this mould); and (b) BSP's defeat of the two biggest national parties, i.e. the BJP and INC.

The BJP had won both Punjab and Uttaranchal in February; but the party secured its lowest return in UP since 1991 with just 50 seats. The INC saw its seats reduced to 21 despite a high-profile campaign, albeit with limited objectives. Although neither went into the UP election with great expectations, both will be well aware that the UP result does not look positive for their prospects in the next general election. However, it remains to be seen whether BSP, which certainly has political aspirations beyond UP and which is a member of the ruling UPA, can translate this into national success. Indeed, if this pattern were to be repeated elsewhere in India with largely state-based parties winning outright majorities, it could serve further to entrench coalition politics at the centre as different parties dominating different states are obliged to accommodate one another in Delhi.

The quest for inclusive growth

Speaking on the BBC World Service in February 2007, India's finance minister, Palaniappan Chidambaram, estimated that it would take until 2040 to wipe out the "abject poverty" which, he acknowledged, currently "afflicts about 25% of India's population".[56]

Mr Chidambaram, citing his "most challenging" task as ensuring "that the economy grows at no less than 8% a year", underlined the relationship between growth and poverty alleviation as follows:

> "Growth gives incomes to people who are employed, throws up jobs for those who are not employed. Therefore growth is imperative. But growth obviously is not sufficient in a country… where a significant proportion lives in poverty: the growth must be inclusive growth. So the task of the government… is to ensure not only growth but that this growth is inclusive growth."

To that end, India's 11th five-year plan (2007 to 2012) – still to be finalised – has the declared objective of "faster and more inclusive growth".[57] This challenge broadly manifests itself at two levels, i.e. among states where a clear divide has opened up between the north and west of the country and the more reformist and consequently wealthy south and east; and, within individual states, among different sections of the population, in particular rural versus urban.

The realisation of that objective – and, through it, the alleviation of "abject poverty" by 2040 – may seem relatively straightforward. It would certainly be so if India were able

[56] *For the full text of the interview see http://news.bbc.co.uk/1/hi/business/6330691.stm.*

[57] *The magnitude of the poverty alleviation task still facing India should not cause us to lose sight of significant achievements in this respect since independence and especially since the economic reform programme of 1991. As Pavan K Varma notes in his book* Being Indian *(Arrow Books, 2004 – page 180): "More people in India have been rescued from absolute poverty in the past fifty years than the entire population of Europe. The job could have been done better: over 200m people are still very poor. Significantly, however, poverty levels fell most dramatically – by 10 per cent – in the decade since the economy was liberalised in the 1990s, further proof that in India only an expansion of the economic pie, and not state-sponsored policies seeking to redistribute growth, ultimately benefit the poor."*

lift itself from what T.N. Ninan, has described as the "one per cent society", i.e. a society which improves socio-economically by around 1% per year, into a 2% society (as China has).[58]

The FY08 budget, unveiled on 28 February this year, is arguably consistent with both the principles noted above, i.e. the systemic and cyclical challenges which the Indian government faces in pursuing structural reform and the need nevertheless to aid the economy's longer-term prospects with poverty alleviation very much to the fore. It concentrated on social spending, especially education and healthcare, and on rural infrastructure, consistent with Mr Chidambaram's quest for "faster and more inclusive growth".[59]

As such:

- The budget raised the total expenditure on education by 34.2% to INR324bn (US$7.3bn);
- Similarly, health spending rose by 21.9% to INR153bn (US$3.5bn); and,
- The government set a target of raising annual growth in the farm sector from an average of 2.3% in FY02-06 to 4% by FY12 (i.e. the end of the new five-year plan) by increasing significantly the budgets for a number of flagship rural development programmes, as well as credit to the sector.

If these measures are implemented properly – and especially when put alongside the proposed increase in infrastructure expenditure encapsulated in the 11th five-year plan – they almost certainly have the potential to lift India's growth prospects. While additional education and health spending may bring only longer-term benefits (see *Box 25: A healthy India… for a wealthy India*), the focus on agriculture is critical if the government's medium-term target of raising growth to 10% p.a. by FY12 is to be met.

But even more important, if sustained, may be the shift in political philosophy implied by Mr Chidambaram's budget. This was consistent with a key aim for India summed up in a 2006 paper by the then economic counsellor and research department director at the IMF, Dr Raghuram G. Rajan, as follows: "…a focus on creating an enabling environment that provides access for all to education, health care, finance, and, yes, a minimum safety net – indeed, a focus on spreading opportunity rather than mandating outcomes – will be a better way to achieve both growth and social justice".[60]

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[58] *The former South Asia Bureau Chief of* The Financial Times*, Edward Luce, in his book* In Spite Of The Gods: The Strange Rise Of Modern India *(Little Brown, 2006 – page 336) elaborated as follows: "Whichever indicator you choose, whether it is economic or social, India is improving at a rate of roughly 1 per cent a year. For example, India's poverty rate is declining at about 1 per cent a year: in 1991 it was 35 per cent; by 2000 it was 26%. It has probably continued to decline at roughly the same rate since then. Or take India's literacy rate: in 1991 it was 52%; by 2001 it was 65%. Or life expectancy: in 1991 the average Indian would live until around the age of fifty-eight; by 2001 that had risen to sixty-five years. Roughly the same congruence emerges from its international rankings. India's human development index, which is compiled by the United Nations Development Programme, went for 0.254 in 1970 to 0.602 in 2005, which translates into an annual improvement of about 1 per cent."*
[Note: in fact the March 2007 Indian National Sample Survey puts the poverty level in 2004/5 at 21.8% of the population, i.e. more or less consistent with the one per cent "rule", and the number of people living below the poverty line in 2004/5 at 238.5m – 170.3m in rural areas (where poverty fell more quickly during the survey period) and 68.2m in the cities.]

[59] *The corollary of this focus on social spending is that measures such as labour and product market reforms, privatisation and the removal of caps on foreign direct investment in banking and insurance were notable for their absence from the budget – no surprise given the political realities with which the government has to grapple. The 2008 budget and, if it falls before the next election, that for 2009 will likely be even more heavily overshadowed by electoral considerations.*

[60] *See "From Paternalistic To Enabling" by Dr Raghuram G Rajan (*Finance & Development*, Sept 2006, Vol 43, No 3). See also "India – Inclusive Growth and Service Delivery: Building on India's Success", Development Policy Review Report No 34580-IN (World Bank, 29 May 2006).*

Box 24: A legacy of anti-materialism

Gandhian philosophy remains an important factor in economic policy.

In his 2006 book *In Spite Of The Gods: The Strange Rise Of Modern India*, Edward Luce, former bureau chief of *The Financial Times* in South Asia, highlights the continued influence of the anti-materialistic philosophy of Mohandas K Gandhi (1869-1948), the spiritual and strategic leader of India's drive to independence, on political and policy thinking. Mahatma Gandhi believed that the village should be the main building block of Indian society in perpetuity, sparking a debate that continues to this day.

Mr Luce illustrates how Gandhianism continues to impact on India's economy through the following example:

"[W]ithout an appreciation of Gandhi's impact on economic thinking, it is hard to explain why India has so badly disabled the ability of its textile sector to grow to a size more fitting with its potential. As any student of development knows, textile production has played a critical role in the industrialisation of most societies, from Britain in the eighteenth century to China in the twenty-first. Gandhi's legacy can be seen in India's continued tariff bias against synthetic fabrics in favour of cotton (when the bulk of export demand is for the former), and in regulations that provide disincentives for textile companies to grow beyond 'cottage industry' size, which penalises commercial success and protects failure."

Since 1991 especially, many of the economic policies which were rooted in the Gandhi philosophy have been altered. But many persist, albeit sustained not so much on Gandhian grounds as in vested interest. Nevertheless, as Bhimrao Ambedkar (1891-1956), the chief architect of India's constitution and himself a Dalit and fierce critic of the Mahatma's promotion of village life, remarked: "The love of the intellectual Indian for the village community is of course infinite, if not pathetic… What is the village but a sink of localism, a den of ignorance, narrow mindedness and communalism".

By "communalism", Dr Ambedkar meant an allegiance to one's own ethnic group which, as noted in the main text, bedevils policy-making in India as it impacts increasingly on voting patterns. y

Box 25: "A healthy India… for a wealthy India"

Reaping the "demographic dividend" depends as much on the health of the labour force as on better education.

Writing on the "rediff.com" news site on 25 August 2003, the chief executive of ITC Limited's agri-business and one of India's leading rural development experts, S. Sivakumar, concluded an article on the Indian healthcare system as follows: "A healthy India is certainly a precondition for a wealthy India". Yet, with the notable exception of the high-profile issues of HIV/AIDS and TB, it is arguable that the issue of healthcare in India has received insufficient attention in analyses of the country's prospects.

Arguably underpinning many of the country's health challenges is malnutrition. As Indian officials conceded earlier this year, India is lagging relative to the UN Millenium Development Goal (MDG) target at the half-way stage in the 15-year programme launched in 2000. According to the FY06 National Family Health Survey, 46% of children aged three or less are malnourished and underweight – a high percentage, compared to 30% for Sub-Saharan Africa – and almost 80% are anemic, a figure which is matched by anemia among pregnant women. Even putting to one side infant mortality (and the WHO estimates that over half of deaths among the under-fives are malnutrition-related) this is a critical issue; for, as Nobel Prize-winning economist Robert Fogel has argued: "It may well be that a very large increase in expenditures on ante-natal care and pediatric care in infancy and early childhood is the most effective way to improve health over the entire life cycle, by delaying the onset of chronic diseases, alleviating their severity if they occur, and increasing longevity".

Overall, according to the Economist Intelligence Unit, India spent just US$41 per head on healthcare in 2006, less than one-fifth of the average for Asia and Australasia; and India has just 0.6 physicians per 1,000 population, i.e. just over one-third of the average for Asia/Australasia and more or less the same ratio as prevailed 20 years ago.

Writing on "rediff.com" on 23 July 2007 about a recent trip to India, Dr Baltej S. Maini, president of the Fallon Clinic Foundation based in Massachusetts, noted "…the frenzy with which hospitals are being built, ostensibly to meet the demands of an expanding middle class population that can now afford the best of healthcare. Not a day goes by that a new healthcare venture is not announced, either in partnership with a foreign company or by an all Indian business house." So, there is clear evidence of progress on some fronts. But Dr Maini goes on to underline the need for a "…coherent and sustainable plan that addresses the healthcare needs of the masses…" and suggests ten reforms consistent with that aim:

- Develop and implement national standards for examination and proper remuneration for healthcare professionals.
- Develop and implement national accreditation of – and performance incentives for – hospitals; those which do not comply would not get paid by insurance companies.
- Obtain proposals from private insurance and the government on ways to provide medical coverage to the population at large and execute the strategy.
- Utilise and apply medical information systems which encourage the use of evidence-based medicine, guidelines and protocols as well as electronic prescribing in in-patient and out-patient settings, including the setting up of electronic health records.
- Perverse incentives between specialists, hospitals, imaging and diagnostic centres on the one hand and referring physicians on the other need to be removed and a level of clarity needs to be introduced.
- Develop multi-specialty group practices with incentives aligned with those of hospitals and payers.
- Encourage business schools to develop executive training programmes in healthcare.
- Update the curriculum in schools which train healthcare professionals.
- Develop public/private partnerships which design newer ways to deliver healthcare.
- Appoint a government commission which makes recommendations for the healthcare system and monitors its performance. ƴ

Populism versus progress?

At the same time, it is reasonable to conclude that the boost to the farming sector was, in part, political. Two-thirds of the labour force in farming translates more or less into two-thirds of the electorate – a weight of voting which no government in India can ignore and expect future electoral success. As the distinguished economics professor, Dr Pranab Bardhan, wrote in a 1998 paper: "Democracy has a way of putting ideas in the heads of the lower classes and the proliferating demands for spoils threaten to catch up with the operators of the machine."[61]

A subsequent article by Professor Pranab highlights the almost inevitable need for any budget to be bedded in *real politik*: "By and large India is less of a legislative and deliberative democracy, more one of popular mobilisation. This usually means short-run populist measures or patronage distribution are at a political premium, not long-gestation attempts at structural transformation of the constraints in the lives of most people."[62]

The overall thrust of the FY08 budget did attempt, albeit in a constrained way, to move away from this paradigm. That said, by extending the National Rural Employment Guarantee Scheme (NREGS), it was not a clean break.[63]

The NREGS was launched in February 2006 by the current government with the strong support of the Left Front and is probably India's most ambitious attempt to date to alleviate poverty through direct state intervention. Its supporters argue, with considerable justification, that over 200m Indians living in abject poverty cannot simply be abandoned until policy measures aimed at improving their lot in the medium term have an impact.

Under the relevant act, the scheme guarantees in law 100 days' employment in every financial year to adult members of every rural household willing to do manual work in return for the statutory minimum wage; the central government stands to meet the wages cost in full plus three-quarters of the material cost and a proportion of the administrative overhead with the balance falling to the state administration. If employment under the scheme is not provided within 15 days of receipt of the application, a daily unemployment allowance will be paid to the applicant, thus providing a strong incentive for the local authorities to fill the jobs. The government aims to have the NREGS cover all districts of the country soon.

When the scheme was first floated in 2004, it was criticised by many Indian and international economists who claimed that: "If, as expected, the programme spreads across the whole country, it will eventually cost India up to 2% of its GDP and between 10-20% of its annual budget. Yet it promises no investment in upgrading the skills of the people it is designed to help. Nor does it invest in genuine rural infrastructure, such as all-weather roads, proper electricity supply or new agricultural technologies. Such investments would stimulate greater economic activity that would be much more likely to create lasting employment for the rural poor."[64] Additionally, they cite the difficulty of avoiding "leakage" from the scheme as a significant proportion of the funding may fail to reach its intended beneficiaries.[65]

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[61] The Political Economy Of Development In India *by Pranab Bardhan (Oxford University Press, New Delhi, 1998) page 78.*

[62] *See* Democracy and Distributive Politics In India *by Pranab Bardhan (April 2005).*

[63] *Under the 2007 budget NREGS, which is ultimately intended to cover the whole country, was extended from 200 to 330 districts and allocated INR120bn.*

[64] In Spite Of The Gods: The Strange Rise Of Modern India *by Edward Luce (Little Brown, 2006) page 202. Mr Luce goes on to suggest that NREGS "…is significant because it distinguishes India's approach to poverty very clearly from that of neighbouring China, which has preferred to create jobs indirectly by stimulating high (public and private) investment in the economy".*

[65] *In a 2 January 2007 article entitled "Unreformed Politics" and published on the* Financial Times *website, T.N. Ninan wrote that Congress "has revived its faith in the 'hand-out' politics that Indira Gandhi perfected, and which her son had wanted to shed because only 15 per cent of the money reached the intended beneficiaries". The article goes on to ask: "…can a proper social safety net be financed if the government were to shut down programmes and subsidies that don't reach the poor? A basic programme may cost no more than 2 per cent or 3 per cent of GDP: but as in the case of other programmes, the constraint is not the money but the government's ability to correctly identify the needy beneficiaries".*

For now, the jury should remain out over the impact of NREGS *per se*. At least it is now coupled with programmes designed to root out through economic growth what Mahatma Gandhi memorably described as "the worst form of violence" – poverty.

Demographics and urbanisation – make-or-break opportunities

The importance of making this interplay between government programmes and private sector investment work is underlined by India's demographics, most critically in the short- to medium-term when over half India's population will remain below the age of 25. Often portrayed simply as a "dividend", the reality is considerably more complex.

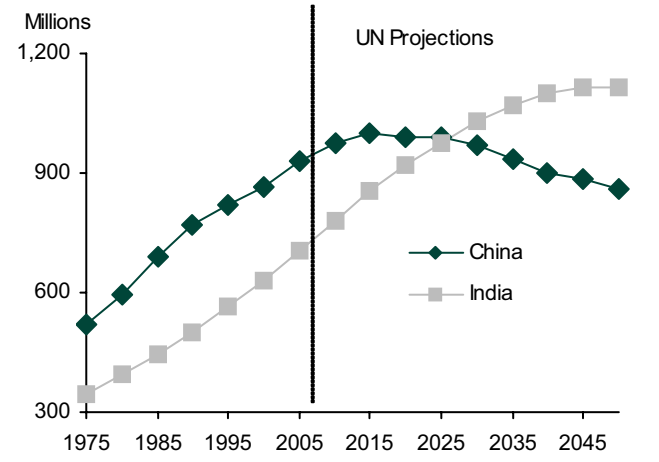
According to the United Nations, India's working age population (i.e. 15-64 year-olds) is projected to surge by 150m over the decade from 2005 to 2015, to a total of 854m. This is in contrast to China: there the growth of the working age population is decelerating to the point where it is projected to start falling outright some time between 2015 and 2020 (Figures 66). In 2020, the average Indian will be only 29 years old, compared with an average age of 37 in China and the US, 45 in Western Europe and 48 in Japan[66].

In an environment where the population of most other major economies is aging, the availability of a rapidly expanding pool of young workers could and should be a major advantage for India's economy. However, the full benefits are only likely to be realised if the new generation of workers is healthy and educated, and if the government succeeds in addressing infrastructure, bureaucracy and labour market constraints in a manner which facilitates the requisite level of job creation by the private sector.

Indeed, the stakes for the government are yet higher as population growth fuels a process of urbanisation over the next decade which has previously been held back (see *Box 24: A legacy of anti-materialism*) and is therefore really only just beginning. At present, relative to GDP per capita an unusually low 30% of India's population lives in the cities.

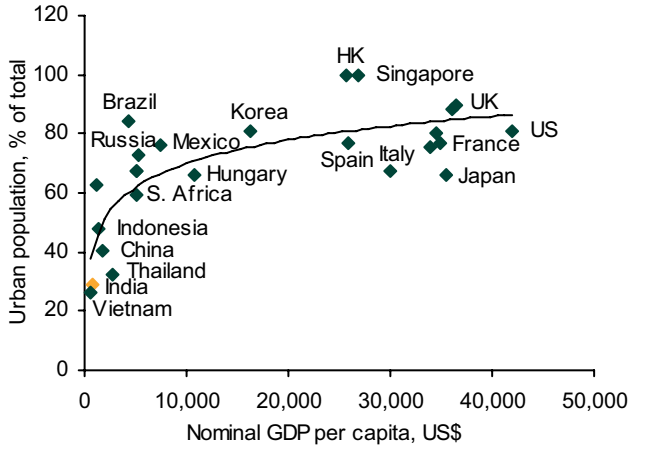
One of the strongest relationships in economic development is that urbanisation rises with GDP per capita in a "hockey stick" fashion as cities provide large economies of agglomeration for individual activity (Figure 67). Thus, if India's GDP per capita continues to grow at a double-digit rate, its urbanisation rate could rise to over 40% over the next decade. According to the IMF (2007b), India will have eight of the world's thirty fastest-growing large cities between 2005 and 2020, while China is projected to account for ten.

Figure 66. Projections of the working age (15-64) populations in India and China



Source: United Nations and Lehman Brothers.

Figure 67. Urbanisation rate and GDP per capita in 2005



Source: World Bank and Lehman Brothers.

[66] *Reddy (2007), citing projections made by the United Nations.*

Migration from the countryside to the cities can be a powerful source of productivity growth for economies in which a large share of the labour force is initially under-utilised in agriculture. In India 57% of the workforce is in the agricultural sector which nevertheless produces just 18% of national output. The unemployment rate for agricultural labour households is estimated at over 15% and many of those who do have jobs appear to be under-employed. The clustering of people and firms in cities can boost productivity and promote economies of scale in many ways: search and travel costs are reduced; specialisation is easier; new skills, technology and innovations can be dispersed faster; and competition is greater.

China provides a powerful example of the potential gains from urbanisation. There, the urbanisation rate rose from 18% in 1978 to 28% in 1993 and then shot up to 44% by 2006. It has been estimated that the reallocation of under-utilised Chinese agricultural labour to the cities added 1-2pp annually to average labour productivity over the past two decades (Bosworth and Collins, 2007; and Heytens and Zebregs, 2003). India, where labour productivity in industry and services is estimated to be four to five times higher than that in agriculture, stands to make similar gains. In a recent study on India, Bosworth, Collins and Virmani (2007) estimated that whereas workers moving from the countryside to the cities enhanced productivity by 0.6pp over 1983-93 this had risen to 1.2pp by FY04; and, judging from China's experience, it could double again over the next decade.

And yet, India's major cities are already facing considerable strain, with over half the population of some metropolitan areas living in slums. According to Dr Rakesh Mohan, Deputy Governor of the RBI, speaking on "Managing Metros" at a seminar in January 2006: "This has been caused by both faulty national economic policies that have discouraged urban employment growth, particularly industrial employment, and by rigidities that have inhibited urban infrastructure investment". The latter may at least in part be attributable to local governance structures which are rooted in the colonial era. With the exception of the National Capital Territory of Delhi, these governance structures place ultimate decision-making about urban planning and development primarily in the hands of the state authorities, which have tended to be preoccupied with the challenges of non-metropolitan areas (where, after all, the majority of the electorate still resides) – see also *Box 21: Economic growth and the law* and *Box 22: The centre and the states*.

According to Mayraj Fayim, a local government expert: "Over the past couple of decades, India has seen the implementation and framing of efforts to modernise local government and has also revealed in the course of these efforts a commitment to local government that was hitherto a weak link in the Indian system. Nevertheless, it remains a system in transition that has room for further evolution to match its prevalent ground conditions." [67] The Maharashtra state government announced plans in June 2007 to engage private sector property developers in the redevelopment of the Dharavi district of Mumbai, which is currently home to around 600,000 slum-dwellers. These plans are important for the modernisation of Mumbai and its ambitions to become a global financial hub (see Chapter 4: Developing the financial sector); but they are important also as a test case for the ability of India's local governance structures and systems to address the challenges of urbanisation in the face of inevitable resistance.

[67] *"Local Government In India Still Carries Characteristics Of Its Colonial Heritage" by Mayraj Fahim (City Mayors Government, 14 January 2006).*

The same is true – indeed, even more so ъ of even more ambitious and more important proposals for Mumbai's medium-term economic well-being centring on infrastructure upgrading: the Maharashtra government is projecting expenditure of US$60bn on infrastructure over the next decade, of which the authorities are hoping the private sector will find all but US$9bn already earmarked by central government.[68] But, before handing over its US$9bn, the government is insisting that Maharashtra repeal its Urban Land Ceiling Act which restricts urban land holdings and which, together with rent controls, is widely judged to have been a significant block on residential development in particular for many years. The state parliament failed again in July to repeal the law although, more promisingly, legislative moves are now afoot to scrap rent controls.

This legislative impasse underlines a fact that *The Economist* highlighted in its 1 September 2007 edition as perhaps the biggest single problem confronting urban planners: "To redevelop Mumbai and its hinterland involves moving people. And since in India third-world conditions are dignified…with first-world rights, this causes blockages. The [300,000 squatters living around the "semi-retired" second runway] of Mumbai airport, for example, have at least four representatives in Maharashtra's state assembly."[69]

Writing in the *Financial Times* on 13 August 2007 to mark the 60th anniversary of India's independence, Dr Amartya Sen commented: "…India also had…the problem of government under-activity in fields in which it could achieve a great deal. There has been a sluggish response to the urgency of remedying the astonishingly under-emphasised social infrastructure – for example, the need to build many more schools, hospitals and rural medical centres – and developing a functioning system of accountability, supervision and collaboration for public services. To this can be added the neglect of physical infrastructure (power, water, roads, rail), which required both governmental and private initiatives. Large areas of what economists call 'public goods' have continued to be under-emphasised."[70]

Matching labour supply and demand

As Dr Sen suggests, just as pressing as the challenges posed by the demand for physical infrastructure in urban and rural areas alike are those related to matching up supply and demand in the labour market.

At the top end of the market, a study published in 2006 by India's National Association of Software and Services Companies (Nasscom) suggested that, of the 3m students graduating from Indian universities each year, only 10-15% of general college graduates and just 25% of engineering graduates are considered suitable for employment in the offshore IT industry.[71] The projected consequence of this was a shortfall of 500,000 professionals by 2010. Commenting on the study, Nasscom president Kiran Karnik was reported as saying: "While some young men… desperately look for work, employers elsewhere look – with almost similar desperation – for appropriate people to fill tens of thousands of vacancies. Our education system is not producing enough people with the skill-sets our economy needs. This could seriously stymie India's economic growth."[72]

According to industry body ASSOCHAM (Associated Chambers of Commerce and Industry of India), skilled in-demand job-hoppers are increasing companies' attrition rates to more than 20% a year. This is not restricted to the software industry. News

[68] *Mumbai is India's most populous city – conservatively estimated at 14m people. It is set to grow to nearly 25m by 2015 according to UN projections, making it the world's second biggest city after Tokyo. The total population of its wider metropolitan region of 438 sq km is already estimated at 18m, over half of whom live in slums. Population density is around 34,000 persons per sq km, i.e. over seven times that of London and 15 times that of Greater Los Angeles. Approximately 85% of the population (a number equivalent to the total population of Norway) is estimated to use public transport every working day, with over 3m commuters a day from the suburbs largely dependent on overloaded rail services where, at peak times, trains designed for a maximum of 1,700 passengers carry up to 5,000.*

[69] *See "Maximum City Blues";* The Economist, *1 September 2007, pp45-6.*

[70] *See "Can Life Begin At 60 For India" by Amartya Sen (*Financial Times*, 13 August 2007).*

[71] *See* Globalisation Of Engineering Services – The Next Growth Frontier For India *(Nasscom/Booz Allen Hamilton, August 2006).*

[72] *See "Engaging India: Demographic Dividend Or Disaster?" by Jo Johnson (FT.com, 15 November 2006).*

reports suggest that Hindustan Construction, an engineering firm, is bringing in civil engineers from the Philippines to meet the demand.

Furthermore, even India's elite institutes of management (IIMs) and of technology (IITs) continue to struggle under government-imposed restrictions which significantly constrain their ability to meet demand. These include: salary caps for professors which are not competitive with private sector pay for comparable skills; government approval of tuition and fees; tight budgets; a bar on setting up overseas' campuses; and, most recently, a legal requirement that 27% of places are "reserved for members of other backward classes". An employee at a call centre can make twice as much as a university lecturer. Private institutions are exempt from these restrictions but can only make up so much of the shortfall, especially if "feedstock" of the requisite quantity and quality is not coming through the schools system.

Significant though the mismatch in higher education clearly is, it pales by comparison with that between the education system and the organised sector farther down the labour market. Here, the FY08 budget must look at least to begin to break what amounts to a vicious circle. Despite notable improvements in basic education and literacy rates since independence, independent estimates point to 20% of Indian children between the ages of 6 and 14 not being in school.[73] The private sector can do – and is doing – a certain amount in terms of post-school training; but the impact of those efforts will always be limited where basic numeracy and literacy are in short supply. Unfortunately, while training can be rolled out relatively quickly to upgrade basic skills, the sort of reform of the education system that is required to inculcate those skills in the first place and meet the school-leaver demands of both the private sector and the higher education system cannot be achieved overnight. Indeed, corrective measures brought in now will only really bring their full benefit to bear towards the latter part of the next decade.

There is no single explanation for low enrolment, widespread truancy and high drop-out rates from basic education. However, one significant factor is the fact that working often seems a better alternative to school because of major deficiencies in the provision of primary education for the masses. The International Labour Organisation estimates that, in consequence, there are around 44m child labourers in India.[74]

The overall impact of this is a shortage of the very skills which would facilitate entry into the organised sector of the economy, which is a key element in driving up economic growth and sustaining it at double-digit levels.

To their credit, as the FY08 budget testifies, government ministers and senior officials are well aware of the threat this poses to India's medium- to longer-term growth. Furthermore, they recognise that, while the private sector can be expected to pick up some of the slack in secondary education at least, the main burden of redressing the present shortcomings in rural areas in particular must rest with government – including public sector initiatives for non-graduates to supplement what individual firms are increasingly doing by way of apprenticeships.

Furthermore, where sound primary education is available, Indians are more than likely to respond positively. As the Anglo-Indian writer and actor Sanjeev Bhaskar noted of his visit to Mother Teresa's Loreto Convent in Kolkata earlier this year: "As I spend the morning playing with the kids and going through their English spelling homework with them, it's impossible not to… marvel at how education here is treated with such reverence and respect. In India, children are desperately proud to wear a school uniform

[73] *For example, Unicef estimates that India's literacy rates jumped from 52% in 1991 to 65% in 2001, although there was some scepticism among experts as to what constitutes "literacy" (and, for that matter, "numeracy" in this context), with absolute numbers of illiterates dropping for the first time in history and enrolments in government-run primary schools increasing from 19m in 1951 to 114m by 2001. On the other hand, Unicef's report* 2007 State of the World's Children *cites significant discrimination against girls and women in education, reporting 190m illiterate females in India (despite improvements over the past 15 years or so) and a drop-out rate from primary education of around 70% among girls.*

[74] *For a more detailed resume, see "Engaging India: Investing In Education" by Amy Yee (FT.com, 13 December 2006).*

and revere their books like holy artefacts, understanding that these emblems may be the route to a more satisfying life."[75]

Assuming that the government has some success in addressing these challenges to employability, there remains one major impediment which needs to be addressed if more jobs are to be found in the lower-skilled reaches of the organised sector: labour market reform. As the failure of successive governments to grasp this particular nettle readily testifies, the politics of this are far from straightforward: Raghuram Rajan may well be correct in suggesting that: "…achieving true labour market flexibility, while creating a fairer, more growth-friendly environment for all workers – and not just the minority who are currently in the organised sector – will require systemic change".[76]

One way or the other, without reform of India's labour laws an estimated 10m trade union members (of whom less than 15% are active) will continue to block employment for significantly larger numbers of poor people by ensuring that demand for new hires, in the absence of an ability to fire, remains way below potential.[77]

Will the "Gini" stay in the bottle?

One should always be cautious applying to emerging economies socio-economic models based primarily on industrialised western economies. This is perhaps especially so in the case of India. Pavan K Varma suggests that: "…Indians have one quality which has stood them in good stead: resilience. The quality is the product of centuries of experience handling adversity. No foreigner can ever understand the extent to which an Indian is mentally prepared to accept the unacceptable." Thus, simply extrapolating from established measures of income inequality such as the Gini coefficient may tend to overestimate the likelihood of significant civil unrest should India fall short in its objective of more inclusive economic growth.

That said, while arguably a special case, the recent intensification of Naxalite violence offers a salutary warning to the Indian authorities both in Delhi and, more especially, in those states where the threat is most rife. Nearly 300 people were killed by Naxalites in the first four months of 2006, a level of violence which outstripped that in Kashmir for the first time

The neo-Maoist Naxalites (named after a peasant uprising nearly 40 years ago in Naxalbari, West Bengal) are today sufficiently well-organised and widespread that 76 out of 299 districts across nine states in eastern and central India are "badly affected", according to an official report (see Figures 68 and 69 for a comparison across India's states). While they almost certainly pose no existential threat to the state either now or in the long run, in parts of some states they do run a *de facto* "parallel" administration.

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[75] *See* India with Sanjeev Bhaskar *by Sanjeev Bhaskar (BBC Publications, 2007) p91. The book accompanies a BBC TV series celebrating the 60th anniversary of Indian independence. Of the convent itself Mr Bhaskar writes: "Here the people of [Kolkata] have taken the future into their own hands. While the school produces highly educated women who will go on to play a huge role in the new Indian dream of prosperity and international recognition, it also attempts to alter the very social fabric of the city that surrounds it. The Principal, a remarkable Irish sister named Cyril Mooney, founded the programme in 1985 and today the school has 1400 children, half of them from wealthy families who pay fees, and the other half from underprivileged homes who do not… [On] the top floor of the building a special space is devoted to the Rainbow Project. Here, the city's children are brought into the school and taught basic maths, reading and writing skills… The genius of the scheme is that regular pupils from the school (and not the teachers) teach the street children on a one-on-one basis, gradually enabling them to join in with regular classes. It means that for many of the street children, understandably wary of adults, their anxieties are assuaged by being helped by one of their peers…. The joy of this system is that the poor get an education, and the older, wealthier kids learn about taking responsibility for the poor…"*

[76] *See "From Paternalistic To Enabling" by Dr Raghuram G Rajan (*Finance & Development*, Sept 2006, Vol 43, No 3).*

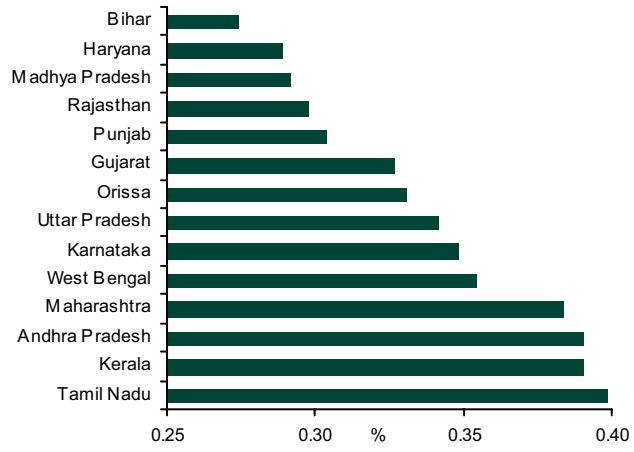
[77] *For example,* The Economist *reports that the Confederation of Indian Textile Industry (CITI) forecast in 2006 that, following the roll-out of the WTO's Agreement on Textiles and Clothing in 2005, the Indian textile industry stood by 2010 to generate US$40bn in annual exports and to provide 12m additional jobs (i.e. on top of the 35m or so which are currently largely bedded in the "unorganised" sector). However, in a letter to India's finance minister, CITI warned that this target would likely not be achieved if the industry remained unable to hire workers on short-term (i.e. 5-6 month) contracts, arguing that – in contrast to the 100 days of paid employment guaranteed by NREGS – many textile firms would be able to offer 150 days of employment if they were able to let surplus staff go. See "Can India Fly? – Now For The Hard Part",* The Economist*, 1 June 2006.*

The extent to which the Naxalites are indeed motivated by what they see as socio-economic injustice is not clear (although that undoubtedly plays a part). What is clear, however, is that their actions are a significant disincentive to domestic and, more especially, foreign investors who might otherwise bring much needed economic and employment growth to some of the poorest parts of India, especially in the mining and iron and steel industries, thereby prolonging the very conditions on which Naxalism likely feeds. Consistent with this, the government has explicitly recognised that Naxalism is more than just a law-and-order issue by advocating a two-pronged approach in the affected areas, i.e. the immediate restoration of law and order and a short- to medium-term boost to economic development.[78]

Overall, according to the US government, in both 2005 and 2006 India lost around 1,300 lives to acts of terrorism, putting it second only to Iraq. Most of these deaths were in the north and north-east and are attributable to nationalist and Maoist/Naxalite insurgencies. However, the 11 July 2006 attacks in Mumbai, which killed 209 people and injured over 700, and the 25 August 2007 blasts in Hyderabad, which killed 43 and injured scores, were salutary reminders that the major urban centres of India are not immune from terrorist attacks; and that Islamic terrorism likely also poses a significant threat – even though in neither case (nor with the February 2007 bomb which killed 68 on a train in Haryana) has any group either claimed responsibility or been shown conclusively by the Indian authorities to be responsible.

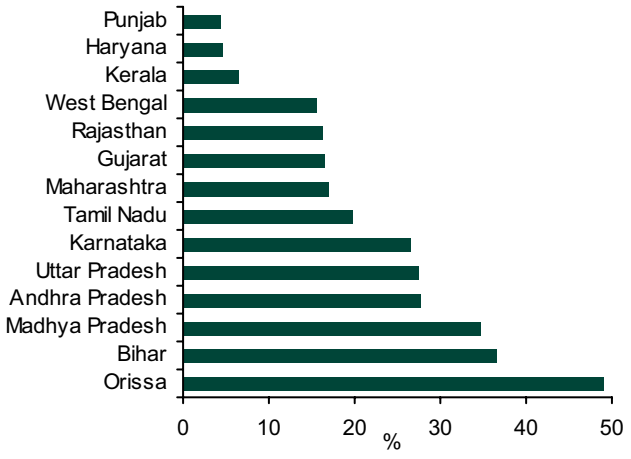
As noted in *The Economist* following the Hyderabad attacks, especially given the failure of any organisation to claim responsibility, it is "uncertain… what the bombers might be hoping to achieve: an end to the peace process between India and Pakistan; or perhaps to commit just enough murder against an old enemy to keep their networks alive. Either way the violence is worrying for India."[79] (see *Box 26: The economy and international relations*).

Figure 68. Gini co-efficient across Indian states (%) in 2004



Source: Jha et al *(2006) and Lehman Brothers.*

Figure 69. Headcount poverty rates across Indian states in 2004



Source: Jha et al *(2006) and Lehman Brothers.*

[78] *For more background on Naxalism see "Countering Naxalite Violence In India,* IISS Strategic Comments, *Volume 12, Issue 7 (August 2006).*
[79] *See "Mad and Hyderabad",* The Economist*, 1 September 2007, p46.*

It's the economy…

However, the even larger challenge for the authorities is that even the vast majority of poor Indians who are not attracted by the extremes of Naxalism, including those in the major conurbations to which Naxalism has not (yet) spread, will become increasingly unsettled at widening income disparities which are readily apparent nationwide in an era of mass media and mass communications. To date, such dissatisfaction has been reflected largely at the ballot box. But even in a society notable for individual and collective resilience, it is by no means certain that that will remain the case.

Thus, for all the political challenges it presents, India's political classes would do well to heed the advice of the ancient Indian philosopher Mallanaga Vatsyayana who argued that *artha* (i.e. sound economics) should always be the first priority as "the livelihood of men is dependent on it alone".[80]

In India as elsewhere, therefore, the principal political challenge confronting central and local government alike is presently – and will remain for the foreseeable future – facilitating and ensuring inclusive economic growth, even if/when that involves taking policy steps which risk short-term electoral unpopularity. Inevitably, there will be compromises. But, provided politics do not stymie the ability of the private sector to continue to drive high growth levels, India could lift its potential economic growth rate to 10% or so over the next decade. We explain our reasoning in the final chapter, and also discuss the implications for India's financial markets.

[80] *See* Being India *by Pavan K Varma (Arrow Books, 2004) page 61.*
Mallanaga Vatsyayana was a philosopher in the Carvaka tradition, a materialistic/atheistic school of thought which is broadly classified alongside Buddhism and Jainism but which died out around the 14th century CE. He is thought to have lived during the early part of the Gupta period, which lasted from 250 to 550 CE, and is most famous – in the West at least – for his authorship of the Kama Sutra.

Box 26: The economy and international relations

India has long prided itself on being a "status quo" power with a "hands-off" foreign policy. However, the quest for economic growth is set increasingly to test that positioning both regionally and globally.

The region…

That "India lives in a dangerous neighbourhood" (an oft-repeated observation which is often attributed originally to Henry Kissinger) has been axiomatic for at least the majority of the post-independence/partition years. Despite "de-hyphenation" from Pakistan, that is still very much the case. Pakistan itself is politically fragile; full-scale civil war has resumed in Sri Lanka; Nepal remains unstable; and democratic rule was suspended in January in Bangladesh. Although, as the region's most stable country, India gains some benefit from its neighbours' misfortunes in the form of higher foreign investment and enhanced trade volumes, regional trade benefits which would otherwise accrue remain unexploited. Most notably, the South Asian Association for Regional Co-operation (SAARC) has, to date, singularly failed to meet its objectives of increasing economic and trade integration in the region – according to the World Bank intra-regional trade amounts to less than 2% of South Asian GDP. Furthermore, access to energy sources – a high priority for India – in Iran (via Pakistan), Bangladesh and (via Bangladesh) Myanmar continues to be problematic.

India's traditional "non-interference" notwithstanding, economic imperatives and an associated need for regional stability are now starting to shape policy. India is active behind the scenes in Nepal and is working with the military-backed government in Bangladesh to deepen commercial ties and to combat terrorism. Bilateral negotiations launched four years ago with Pakistan (including the landmark nuclear pact signed in February 2007) grind on despite repeated terrorist efforts to derail the talks (notably the bomb attack on the Mumbai rail system in July 2006 which threatened major disruption to the city's critical infrastructure). Indian prime minister Manmohan Singh's April 2007 offer of (non-reciprocated, if necessary) duty-free access to the Indian market for the "least developed" SAARC members was another welcome step albeit one which will yield little benefit without a significant reduction in non-tariff barriers.

...and beyond

However, as an aspiring global power, India has devoted more attention to relations beyond its immediate neighbourhood. To date, much of this effort has been trade-related. India is now firmly established at the top table of the World Trade Organisation (WTO), irrespective of the outcome of the Doha Development Round, and bilateral trade agreements are currently in the pipeline with at least ten potential partners ranging from ASEAN via the EU to the US and Canada. But there are signs that some of these relations could be set to move to new political and economic levels.

The highest profile to date has been the India/US civil nuclear agreement (which followed the 2005 US-India Defence Framework). While Indian officials privately concede that its non-ratification, which remains a possibility at the time of going to print, would have little direct impact substantively, they acknowledge that its symbolic significance – and, therefore, indirect benefits – to bilateral relations more than justifies the continuing high-level commitment to it by both parties. Explicit recognition of the importance of this deal lies in the EU's moves to resume its own nuclear cooperation with India – a focal point of A.P.J. Abdul Kalam's 25 April 2007 speech when he became the first Indian president to address the European parliament and when he proposed the setting up of an "India-EU renewable energy development programme for taking up advanced R&D in all forms of renewable energy".

Recent bilateral meetings among the leaders of China, India and Japan point to a range of economic and strategic considerations underpinning a new – if still tentative – triangular balance in Asia (granted the considerable influence the US continues to wield regionally). The improvement in the, still delicate, Sino-Indian relations was highlighted by Chinese president Hu Jintao's visit to India in November 2006 – although we see then premier Zhu Rongji's January 2002 visit as in many ways more important, marking a shift in economic relations which has already driven bilateral trade up from US$3.0bn in FY02 to US$25.7bn in FY07. India overtook China as the top destination for Japanese aid in 2004 and Japan was the fourth largest source of foreign direct investment in India in 2006. The commitment earlier this year by prime ministers Singh and Shinzo Abe to a "strategic and global partnership" has yet to fill out substantively, despite the latter's August 2007 visit to India, but is only likely further to invigorate economic ties over time.

In "The Argumentative Indian" (2005), the Nobel Prize-winning economist Amartya Sen wrote: "Intellectual links between India and China, stretching over much of the first millennium and beyond, were important in the history of the two countries…. [A] broader understanding of the reach of these relations… is important for a fuller appreciation…[of] the continuing relevance of these connections, linked as they are with contemporary political and social concerns." While talk of a "new silk route" may be premature, deepening connectivity between China, India and Japan coupled with India's strong historical ties and strengthening contemporary economic links with the Middle East certainly make the emergence of such a real possibility, with India very much at the hub.

CHAPTER 5: CONCLUSION AND MARKET IMPLICATIONS

In the preceding chapters we have examined the drivers behind the surge in India's rate of growth over the past two decades or so – particularly since the start of the 21st century – and the factors which will determine whether that growth can be sustained, or even improved upon, over the next decade. In particular:

- We have taken note of the growth accounting framework, as well as of statistical techniques which extract the trend component from growth. However, while these methods are useful to quantify *what* has happened to an economy, they do not explain *why*: on their own, they are not very useful for forecasting the future.
- We have therefore coupled growth accounting with an examination of the policies and reforms which have driven India's growth acceleration hitherto, before assessing whether the current momentum is likely to be maintained if not increased.

Previous growth accounting studies have suggested that India's long-run potential economic growth rate has generally risen over time, with most recent estimates ranging between 7% and 9% (Figure 70). But our two-pronged approach strongly suggests that even the upper end of this range likely underestimates the reality, such that growth of 10% is, in principle at least, attainable.

Figure 70. Past studies estimating India's growth potential

Name of study	Method used	Estimation period	Potential
Donde and Saggar (1999)	Univariate approach	na	6.3
Dhal (1999)	Production function & Warranted growth	na	8.0 – 10.0
Goldman Sachs (2003)	Growth accounting	na	5.7
Rodrik & Subramanian (2004)	Growth accounting	1960 – 2002	6.7
Deutsche Bank (2005)	Regression	na	5.5 – 6.0
IMF (2005)	Hodrick-Prescott Filter	1970 – 2003	5.0 – 6.0
Virmani (2006)	Growth accounting	na	6.5
11th five year plan draft (2006)	Simulation models	na	9.0
Goldman Sachs (2007)	Growth accounting	1971 – 2005	8.0
Ranjan *et al* (2007)	Hodrick-Prescott Filter & Warranted growth	1981 – 2006	7.0 – 8.0
Oura (2007)	Growth accounting	na	8.0 – 9.0

Source: See references at the back of the report.

Notwithstanding the strongly positive impact on growth which structural reforms to date continue to impart and the remarkable ability of Indian business to work around the various structural and systemic challenges which it faces, our optimism is contingent upon India continuing along the path of structural reform. Thus it is that India has the scope, in our judgement, to lift its long-run potential growth rate higher still to 10%.

A key reason for our optimism is that India's economy is showing evidence of structural changes, led by the business sector. In accounting for India's growth acceleration we, like others, find that stronger labour productivity growth has been a key driver. Also encouraging is that India's economy appears to be taking on many of the characteristics exhibited by other large emerging Asian economies during the early stages of economic take-off. Essentially, their take-offs involved the sort of dynamic interactions – or virtuous circles – which have not occurred in India until recently, and hence which cannot be isolated from its past using conventional, comparative-static, growth accounting analysis. These virtuous circles work as follows:

1. Rising incomes, an increasingly open economy and stable macroeconomic conditions stimulate demand – domestic consumption and exports –and imbue the

private sector and foreigners with the confidence to engage in investment on a large and growing scale.

2. Rapidly growing investment augments the economy's productive capacity, benefiting from economies of scale and putting downward pressure on prices, obviating the need for macroeconomic policy to slow the economy in order to damp inflation.

3. Sustained, rapid economic growth improves the public sector's financial position, thereby reducing the public sector's claim on resources and freeing them up, in an environment of downward pressure on interest rates, for further private sector capital formation.

We see encouraging evidence of all three circles in India's growth dynamic.

The importance of virtuous economic spirals in driving structural growth accelerations is highlighted by the success of the East Asian economies. After isolating the episodes of economic take-off for the Asian countries over 1955-2006, we find a moderately positive relationship exists between the investment-to-GDP ratio and the growth in labour productivity.[81] The relationship is more strongly positive in the case of India's economic take-off since FY94 (Figure 71). The relationship is also more strongly positive for those countries which have experienced particularly rapid economic take-offs of 10% growth or more (Figure 72). This supports our judgement that India still has much to gain from creating an increasingly enabling environment for business, so that its strong demographic and urbanisation trends work to maximum advantage. It also supports our view that, when economies develop rapidly, there can be dynamic interactions resulting in powerful increasing returns to scale which are often underestimated when forecasting potential growth.

We see the following ten yardsticks as central to assessing whether policy is heading in a direction consistent with a further lift in India's potential growth rate to 10% or so.

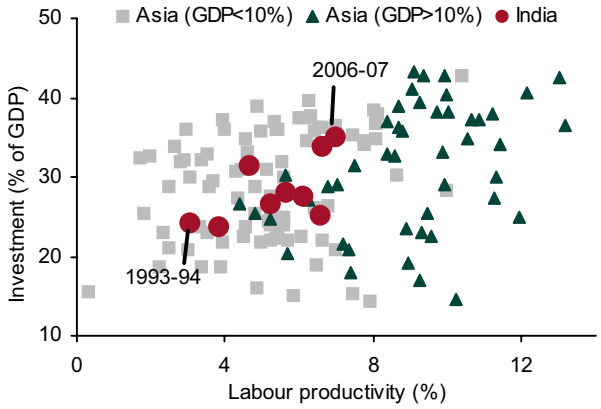
1. **Financial sector development:** We estimate that further reforms, most notably developing the corporate bond market, could add 1.0-1.5 percentage points to India's long-term GDP growth.

2. **Fiscal consolidation:** With favourable public debt dynamics, continued progress in reducing the budget deficit can have large payoffs in boosting public savings. With prudent fiscal policy, we project that India's public debt-to-GDP ratio could decline from 75% to about 60% by FY12.

Figure 71. Labour productivity and investment rate- I

Source: CEIC, NSSO, WDI, IFS, ESRI, ILO and Lehman Brothers.

Figure 72. Labour productivity and investment rate-II



Source: CEIC, NSSO, WDI, IFS, ESRI, ILO and Lehman Brothers.

[81] *The data are annual and the take-off periods are defined as when real GDP* per capita *grows by more than 3% for at least five years (see Box 1: Economic take-off – definitions and drivers).*

3. **FDI liberalisation:** Relaxing restrictions in the banking, insurance and retail sectors could provide major opportunities for development in finance and agriculture. In particular, opening up the retail sector to foreigners could help India become a food factory for the world.
4. **Improving physical infrastructure and reducing bureaucracy:** Because of these constraints to business, India has failed to capitalise fully on its global comparative advantages in labour-intensive industries. By relaxing these shackles on business we judge that India's exports-to-GDP ratio of about 50% could double in the next decade, adding 1.5 percentage points to GDP growth.
5. **Electricity supply:** Among a range of "hard" infrastructure challenges, the provision of electricity ranks high, with the added challenge of generating "clean" power to sustain high growth levels while addressing climate change concerns from which India stands to be significantly and adversely affected (see also 10 below).
6. **Revitalising privatisation.** Public ownership of companies remains excessive in India. International evidence shows that this tends to stymie product market competition since publicly owned companies are generally less incentivised towards profit maximisation than their private sector counterparts and are more prone to political influence and moral hazard problems. A key reform would be reducing the dominance of public-sector banks.
7. **Labour market deregulation:** India's labour laws need to be more flexible in order for firms to increase employment and grow to exploit economies of scale. Developing a stronger safety net could be an important catalyst for labour reforms. The urgency is magnified by the need to ensure that India's strong demographic trend is a dividend and not a dilemma: with half the population under 25 years old, the working age population is set to swell by 150m over the next decade.
8. **Education and health reform:** These two policy areas go to the heart of the inclusive growth agenda by developing social services consistent with boosting participation in the organised sector of the economy, especially among non-graduates and in rural areas. They are key to employing the younger generation.
9. **Managing urbanisation:** State authorities in particular can facilitate addressing the challenges of urbanisation by following the examples of New Delhi and, more recently, Mumbai in allowing the private sector into urban redevelopment.
10. **International relations:** India is increasingly active in promoting closer ties with its neighbours, including China, which stands to benefit the region as a whole economically. More widely, India should continue to take a lead in multilateral trade liberalisation against the threat of rising protectionism in the developed world. Similarly, India has much to gain by setting a positive lead consistent with sustainable growth in the post-Kyoto process.

These indicators sit at the top of a raft of issues that will need to be addressed by central and local authorities in India if inclusive growth targets are to be met even though they present major political challenges given the headwinds from vested interests and democratic coalition-dominated politics. But there will be a new window for rejuvenating reforms after the next general election, reinforced by a recognition of the potentially serious consequences in terms of inclusive growth – given the strong trends of demography and urbanisation – if the shackles on business are not eased.

In sum, India's economy is nearing an important inflection point. It has the potential to raise its economic growth rate to 10% or so over the next decade. In realising that goal, continued structural reforms and prudent macro policies will be critical. India therefore has "everything to play for".

THE OUTLOOK FOR THE INDIAN STOCK MARKET

Supriya Menon
LBIE, Europe
44-207-102-4557
supmenon@lehman.com

Prabhat Awasthi
LBSPL, India
91-22-4037-4180
pawasthi@lehman.com

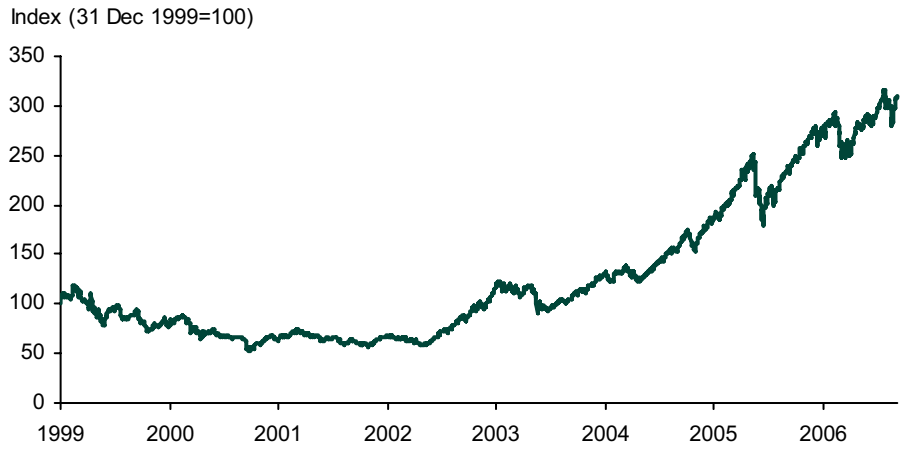
Ian Scott
LBIE, Europe
44-207-102-2959
iscott@lehman.com

SUMMARY

Given the prospects for a sustained high rate of nominal and real economic growth described elsewhere in this publication, the Indian stock market should perform very well over the medium to long term. Although multiples have risen recently, and are reaching levels where the short-term potential for the market might seem lower than it has been over recent years, continued growth in GDP and earnings should mean that investors can still achieve solid returns (Figure 73); our modeling derives expected returns of between 12% and 20% over the next five years.

Before going into details of our approach to valuation, we first discuss the structure of the market.

Figure 73. The BSE Sensex total return daily since 2000



Source: Datastream, BSE, Lehman Brothers.

MARKET STRUCTURE

If, as we judge to be the case, India is to "take-off" to a higher growth trajectory, equity markets have a vital role to play in the dynamic interaction of savings and productive investments. India's equity market infrastructure is quite developed relative to its stage in economic development, as befits a country with a strong "equity culture". Total market capitalisation stands at US$1.1bn, on a par with the South Korean and Italian markets.[82] As a proportion of GDP though, the Indian market, at 89%[83], stands above most other large emerging markets such as China (43%), Brazil (68%), Mexico (41%), Poland (44%) and Turkey (55%)[84], with Russia the exception (98%) (Figure 74).

[82] *BSE.*
[83] *BSE.*
[84] *As of end 2006. Source: World Federation of Exchanges.*

Figure 74. Market cap/GDP ratio for selected national equity markets

	Stock market cap/GDP (end-2006)
Hong Kong	904%
Singapore	291%
Taiwan	167%
Malaysia	158%
Australia	145%
Russia	98%
Korea	94%
India (BSE)	**92%**
India (NSE)	**84%**
Brazil	68%
Italy	55%
Turkey	55%
Poland	44%
China	43%
Mexico	41%

Source: World Federation of Exchanges.

One clear demonstration of the developed equity culture is the sheer number of listed companies in India. The Bombay Stock Exchange (BSE) lists nearly 4800 companies, more than are listed on either the NYSE (2280) or the London Stock Exchange (3256).[85]

Figure 75. Number of companies listed by exchange

	No. of listed companies (end-2006)
India (BSE)	4796
US (NYSE group)	2280
China (Shanghai SE)	842
Korea Exchange	1689
Hong Kong Exchanges	1173
Japan (Tokyo SE)	2416
UK (London SE)	3256
Germany (Deutsche Borse)	760
Malaysia (Bursa Malaysia)	1025
Brazil (Sao Paolo SE)	350

Source: World Federation of Exchanges.

There are two major exchanges in India. The Bombay Stock Exchange was founded in 1875 and obtained "permanent recognition" in 1956. The National Stock Exchange (NSE) was established much later, in 1995. They have roughly the same market capitalisation, with several companies listed on both exchanges (Figure 76).

[85] *End-2006, Source: World Federation of Exchanges.*

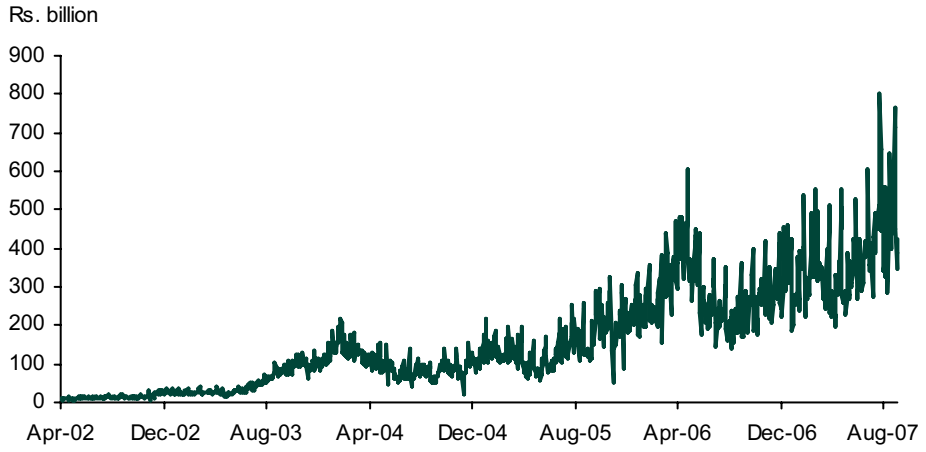
Figure 76. Stock market statistics

	NSE	BSE
Market capitalisation (INRbn)	42,588	45,091
Market capitalisation (US$bn)	1,071	1,133
Market cap % GDP (2006)	85%	89%
Volume (million-30 day average)	493.7	350.4
Value (US$m-30 day average)	2,697.9	1,222
Derivatives trading volume (options and futures-INRbn-30d avg)	494.9	
Derivatives trading volume (options and futures-US$bn)	11.9	
No. of companies listed	1283	4853

As of 6 September 2007, unless otherwise mentioned
Using current INRUS$ exchange rate of 40.7
Source: BSE, NSE, World Federation of Exchanges, Datastream, Bloomberg.

The turnover by volume is higher on the NSE than the BSE. Around US$2.7bn trades in the cash market on the NSE each day, more than twice as high as the BSE. Derivative trading is concentrated on the NSE (Figure 77). At the single stock level, US$6.3bn per day is traded, the majority in single stock futures; index derivatives trading adds another US$4bn a day.[86]

Figure 77. Futures and options daily turnover on the NSE

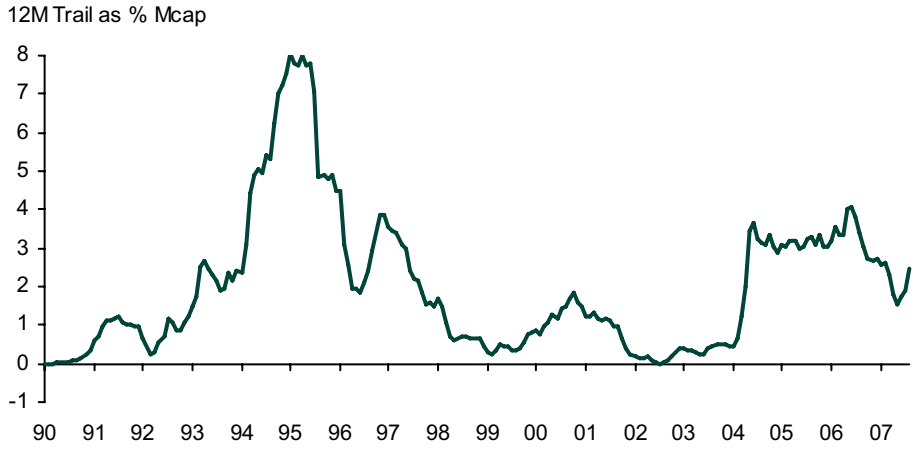


Source: Bloomberg, NSE.

The primary market is also active, with US$48bn of new issues over the past three years. Net issuance (issuance adjusted for buybacks) was equivalent to 2.5% of market capitalisation in August, down from 3.4% a year ago and a peak rate of 8% in the mid-1990s, as shown in Figure 78.

[86] *30-day averages. Source: Bloomberg, NSE.*

Figure 78. Net issuance



Source: SDC, Bloomberg, Datastream, Lehman Brothers, various.

Compared with both Emerging and Developed Market universes, the Indian market is well diversified. Five sectors have weights of more than 10%: Capital Goods, Consumer Cyclicals, Energy, Financials and Technology (Figure 79). Financials, on the other hand, constitute only 14% of market capitalisation in India, compared with 24% for both the Developed Market index and Emerging Markets.

Figure 79. Breakdown of sectors by market cap for India, EM and World

	India	World	EM
BASIC INDUSTRIES	8%	8%	13%
CAPITAL GOODS	10%	9%	6%
CONSUMER CYCLICALS	13%	12%	9%
CONSUMER STABLES	5%	8%	5%
ENERGY	16%	9%	21%
FINANCIALS & INSURANCE	14%	24%	24%
HEALTH CARE	4%	8%	1%
MEDIA	2%	3%	1%
TECHNOLOGY	12%	9%	6%
TELECOMS	9%	6%	10%
UTILITIES	7%	5%	5%

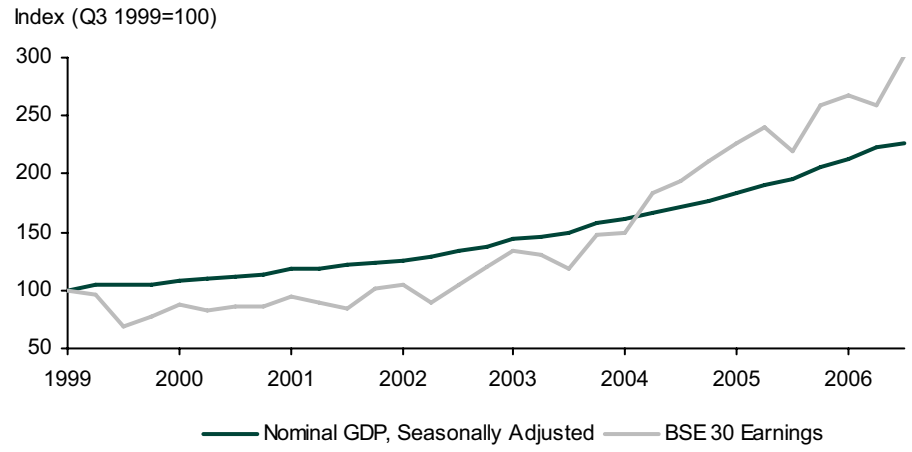
As of September 6, 2007.
Using BSE 500 for India, and FTSE indices for World and Emerging Markets
Source: BSE, FTSE, Lehman Brothers.

FUNDAMENTALS

The first fundamental question to address when analysing equities in a fast-growing economy like India's is whether the accelerated pace of growth has filtered through to corporate profits. As we indicate in Figure 80, the 113% expansion in India's nominal GDP over the past six years has been associated with a 168% expansion in stock market earnings.[87] On the face of it at least, strong economic growth has been reflected in a very high growth rate for corporate profits.

[87] *BSE 30 companies.*

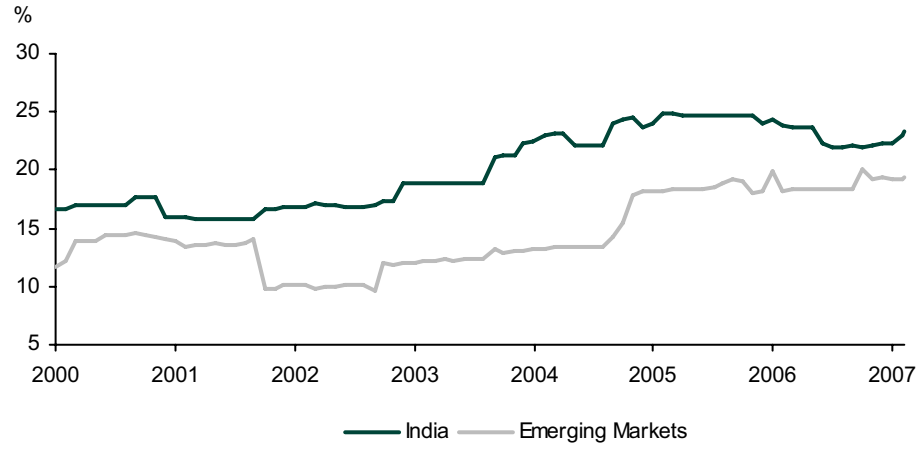
Figure 80. BSE 100 earnings and Indian GDP



Last data point for GDP series is calculated based on the GDP growth estimate from Lehman Economics
Source: BSE, Datastream, Lehman Brothers, OECD.

The next question related to this rapid expansion in earnings is whether it has been achieved with an efficient use of capital. As shown in Figure 81, returns have declined slightly in the past year or so, but they remain well above the level achieved five years ago and also above the returns achieved elsewhere in Emerging Markets.

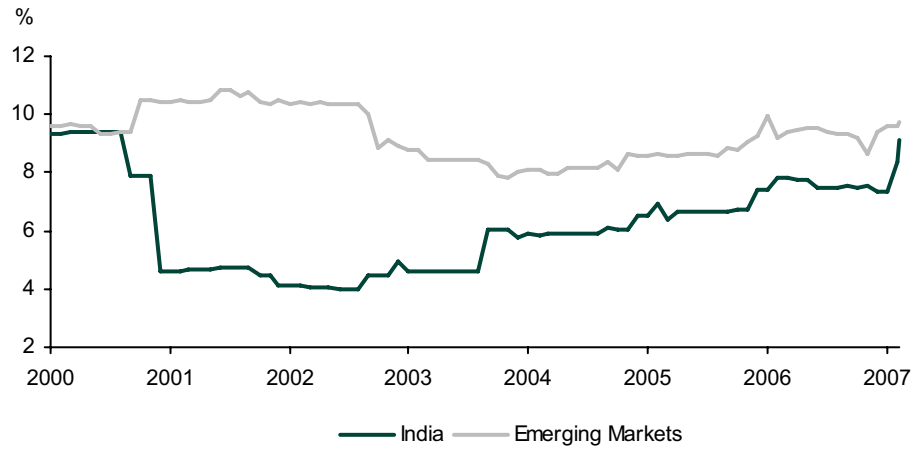
Figure 81. Return on equity: India and Emerging Markets



Source: FTSE, Worldscope, Factset, Lehman Brothers, Extel.

With these attractive returns available, it is not surprising that Indian companies have been increasing their investment spending and thus, in contrast to other Emerging Markets, have seen their capex-to-sales ratio expand steadily (Figure 82).

Figure 82. Capex to sales ratio



Source: FTSE, Worldscope, Factset, Lehman Brothers.

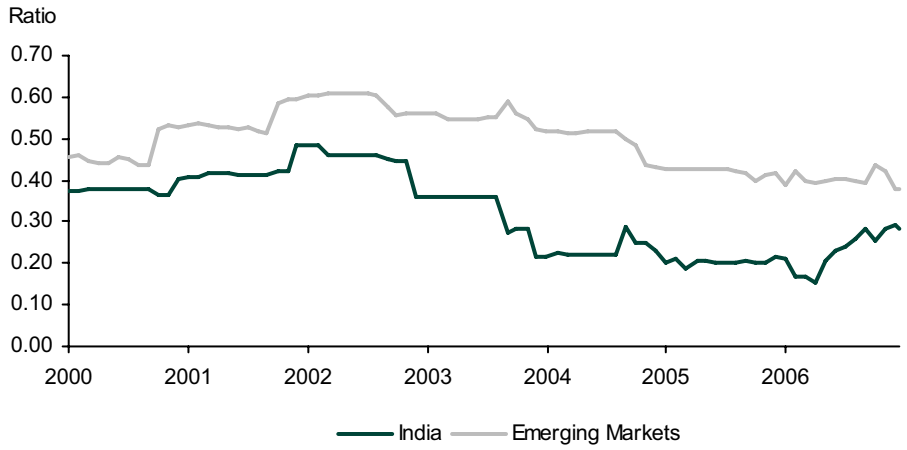
This increased spending on capex has contributed to a decline in the free cash flow of the (non-financial) market as a whole (Figure 83).

Figure 83. Indian listed non-financial companies' free cash flow

Source: Lehman Brothers, FTSE, Worldscope, Exshare.

Further evidence that this expanded capex budget has been financed out of retained earnings, rather than by debt, is given by the data in Figure 84. Indian balance sheets are not heavily geared. Non-financial companies have a net debt-to-equity ratio of 28% compared with Emerging Markets as a whole at 38%.

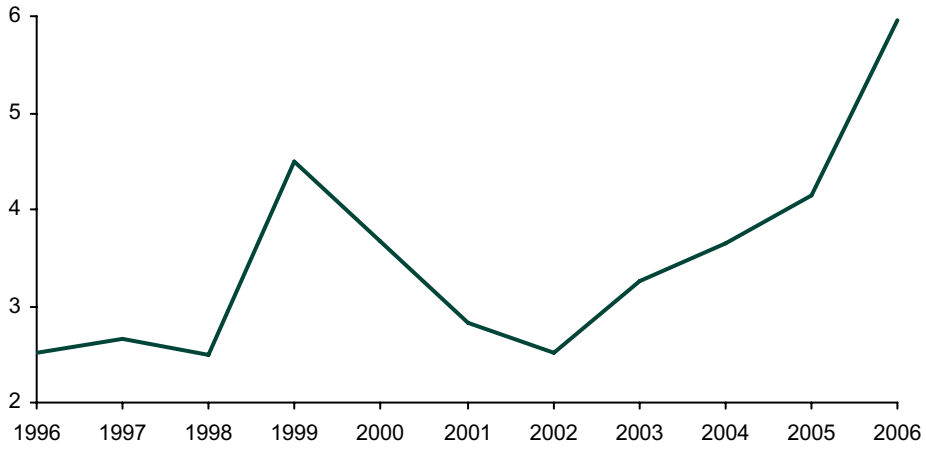
Figure 84. Debt-to-equity ratio



Source: Lehman Brothers, FTSE, Worldscope, Exshare.

Indian companies' sound balance sheet management is reflected in the Indian market's low Altman z-score. This number, which is used to predict corporate bankruptcy, ties the strength of the balance sheet to sales and margins as well as the operational health of the company. As Figure 85 illustrates, India's score has not only improved rapidly but is also the highest in non-Japan Asia.[88] However, much of this progress in creditworthiness has been appreciated by the market.

Figure 85. India's Altman z-score



Source: Worldscope, Compustat, IBES.

Components of the Altman z-score:

EBIT/Total assets: This ratio is used to look at the relationship between assets and pre-tax earnings and how these earnings are being created. A large and cumbersome balance sheet can create lots of earnings. A small balance sheet that creates large earnings is obviously a better option.

Sales/Total assets: This ratio is also comprehensive in that it looks at the relationship between the asset base and sales. This criterion speaks to the way in which the short-term portion of the balance sheet is optimised to create sales. Bloated receivables and/or inventories in the top half of the balance sheet bring down the overall score.

Market value/Total liabilities: This is an interesting ratio in that it indicates the way in which the market perceives the balance sheet. If the market perceives that the company's

[88] *India's Altman z-score of 5.95 compares to 3.33 for Asia ex-Japan, 2.79 in the US, and 2.35 in Japan.*

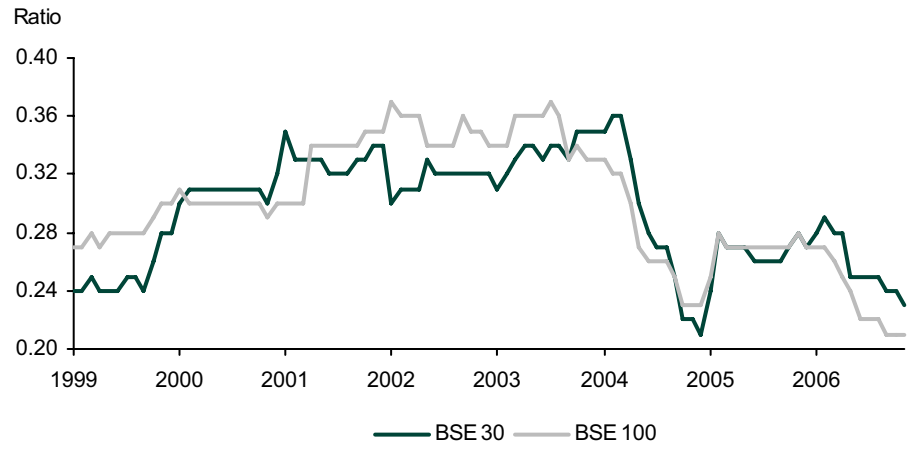
leverage is getting too high, it will punish the company by selling down ownership in it. Thus a falling market value gives off a signal and produces a low Altman score.

Working capital/Total assets: This criterion speaks to the way the company handles its cash and receivables relative to its payables, given the size of its asset base. It is an all-in-one score of balance sheet management.

Retained earnings/Total Assets: This measure looks at the accumulated profits of a company relative to the asset base.[89]

As internal funds have been increasingly allocated to investment spending of one sort or another, the pay-out ratio (defined as gross dividends paid relative to forward earnings) declined from around 35% in 2004 to 22% currently (Figure 86).

Figure 86. India's payout ratio



Source: Lehman Brothers, BSE.

The fundamental underpinnings of the Indian market—earnings growth, high levels of profitability and strong balance sheets—are very strong, by our analysis; however, the next question to ask is: what is the market paying for these healthy fundamentals?

VALUATION

There are a number of ways of approaching the question of valuation for a market like India. In the first instance, we review some of the market's current trade multiples. The market was recently trading at 18.7 times 12-month forward consensus earnings[90] (Figure 86); this is a high multiple both in terms of India's historical performance and relative to other global markets. The only other countries among the emerging markets that currently trade at higher multiples are Argentina (30.3x), Chile (18.8x), and China[91] (24.9x).

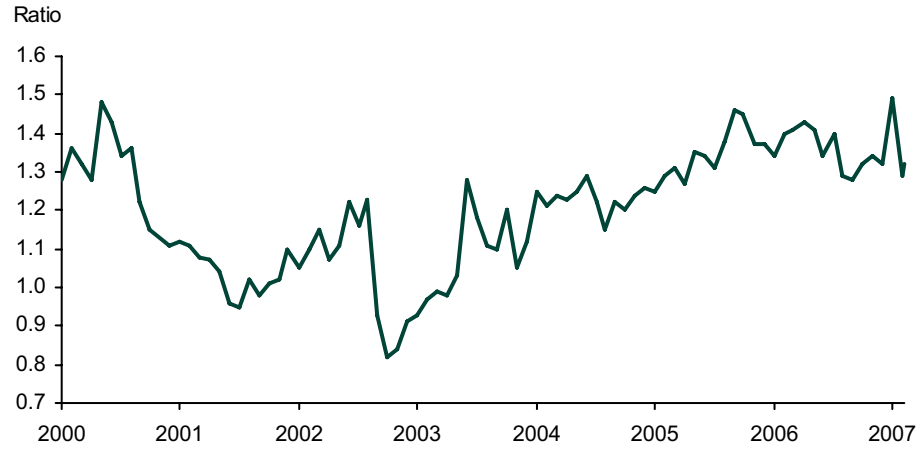
[89] *For more detail, please refer to "The Credit Side of Equities in Asia ex-Japan", Part 1; Paul Schulte/Justin Lau, available on LehmanLive.*
[90] *All multiples refer to the FTSE World indices*
[91] *The FTSE World China index refers to H and B-shares only.*

Figure 87. Indian market 12-month forward consensus P/E multiple

Using FTSE India index
Source: Lehman Brothers, FTSE, IBES, Factset.

With the global Emerging Market index currently trading at 13.5x forward 12-month earnings, the 32% premium accorded to the Indian market is towards the upper end of the historical range (Figure 88). Several Indian corporates are executing new businesses in step-down subsidiaries and P/E ratios do not reflect consolidated earnings in several cases. Sometimes consolidation is not done because these subsidiaries are not yet operational and sometimes because core business and subsidiary businesses are totally different. A rough cut estimate shows that this could account for as much as 8-10% of the valuation of the overall market.

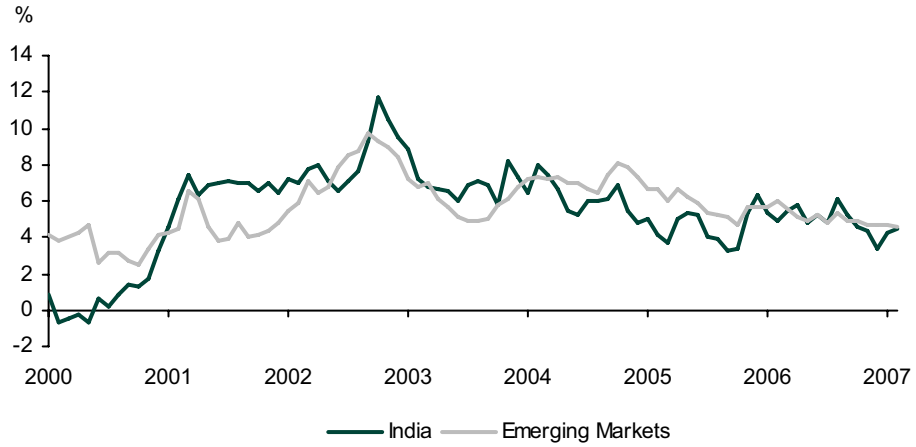
Figure 88. India's P/E ratio relative to emerging markets P/E ratio



Using FTSE indices for both EM and India
Source: Lehman Brothers, FTSE, IBES, Factset.

Viewed in the context of a risk premium (earnings yield less real bond yield) the Indian market also looks slightly expensive. The current Indian market premium of 4.45% compares with an embedded risk premium in Emerging Markets as a whole of 4.57% (Figure 89).

Figure 89. Indian and Emerging Market equity risk premiums (Static estimation*)



** The Equity Risk Premium is calculated as the difference between the earnings yield and the real bond yield*
Source: FTSE, Worldscope, Factset, Lehman Brothers, IBES, Datstream.

Next, we endeavor to benchmark Indian sectoral valuation with those in the rest of the Emerging Markets "space" and the multiples prevailing in the Developed Markets (Figure 90). Relative to the Emerging Markets index, nine out of 11 sectors are more expensive in India and only two have lower P/E multiples. A comparison of sectoral P/E ratios reveals the widest gaps in valuations in the telecoms, consumer staples, capital goods and technology sectors. Relative to the Developed Markets "space", there are nine sectors that currently trade on more expensive multiples in India.

Figure 90. Comparison of sectoral valuations

India	EM	World	India	EM	World	India
	Forward PE			Dividend Yield		
Basic Industries	13.0	11.5	12.7	0.9	1.8	1.9
Capital Goods	21.2	15.1	15.4	0.8	1.4	1.7
Consumer Cyclicals	13.9	15.1	15.1	1.8	0.1	1.6
Consumer Staples	23.7	17.5	17.3	2.6	2.2	2.2
Energy	9.5	9.7	11.6	4.0	2.6	2.1
Financials	16.8	13.7	10.8	1.0	1.5	3.0
Health	19.0	16.9	15.4	1.3	1.0	2.2
Media	32.7	17.0	17.6	0.5	1.6	1.4
Technology	19.6	12.6	18.1	0.8	2.4	0.8
Telecoms	21.5	12.6	14.6	0.1	2.2	3.4
Utilities	18.1	15.4	15.4	1.4	2.3	3.1
Sector-Neutral	19.0	14.3	14.9	1.4	1.7	2.1

Source: Lehman Brothers, IBES, Factset, Worldscope, Extel, FTSE.

Thus, at first blush the Indian market appears expensively priced both on an absolute basis and relative to other Emerging Markets. Yet these static comparisons do not take into account the higher growth projected for the Indian economy. With such a fast growth market it is important to value the future growth prospects, as uncertain as they are.

FACTORING IN FUTURE POTENTIAL

In factoring in the future growth potential of the Indian economy, we have appealed to the Gordon Growth model, i.e., dividend yield plus growth equals the bond yield plus a risk premium. Clearly the bond yield and dividend yield are known, so the key is the future growth rate.

If we assume that in the long-run earnings grow in line with nominal GDP growth, the projections derived elsewhere in this report of approximately 15% long-run nominal GDP growth, (real GDP growth of 10% and long-run inflation of 5%) suggest a risk premium over the long run of about 8% (Figure 91).

Figure 91. Gordon growth model derived equity risk premium

Using: DY * (earnings growth) = Bond yield * RP

Dividend yield	1%
Nominal Economic Growth (proxy for earnings growth)	15.0%
RoE* (1-payout ratio) as proxy for earnings growth using RoE of 20% and Retention ratio of 0.78	15.6%
Bond Yield (10-yr govt bond yield)	7.75%

Gives Risk Premium of 7.8% or 8.4%; rounding to 8%

Adding the risk premium to the risk free rate of 7.75% gives an expected total return of about 16%pa.

We expect 12%-20% upside in the next 12 months

Source: Lehman Brothers.

An alternative approach to estimating the long-run earnings growth potential of the Indian market is to make assumptions about the potential reinvestment rate for the listed sector. Currently Indian listed companies are enjoying a return on equity (ROE) of 22.4%. This is above the long-run average of 20.2% (Figure 81).

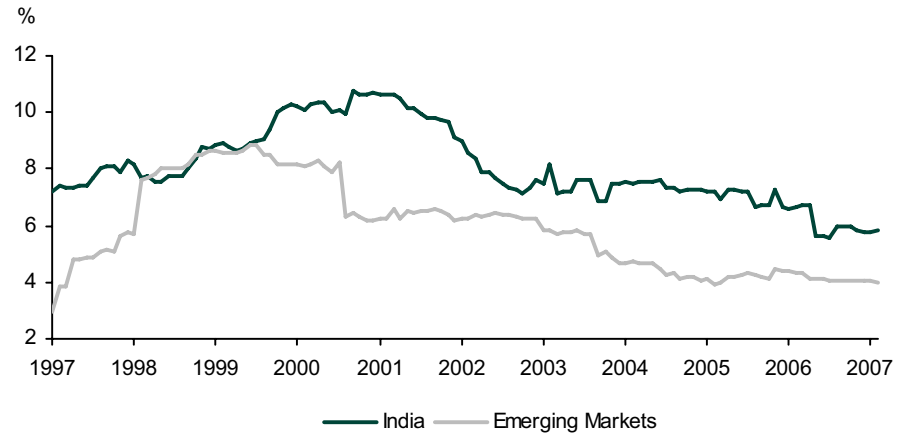
If we assume that a long-run ROE of about 20% is achievable and also assume that the current payout ratio / reinvestment rate split stays at 21% / 79% (Figure 86), then the long-run expected growth rate would also be 15%, i.e., the same answer we derived using projected nominal GDP growth rates.

Again plugging this into our Gordon Growth Model gives a long-run risk premium of 8%. So factoring in the long-run growth potential produces an expected total return of 16% (dividend yield + growth) and a generous risk premium of 8%. Assuming long-run inflation of 5%, this suggests a long-run real return of 11%.

This risk premium is above most estimates of the long-run achieved premium in markets such as the US and UK, as well as other studies on a global basis. But what of the risks associated with investing in Indian equities?

In absolute terms, the volatility of monthly price moves in the BSE index shows a declining pattern since 2000 (Figure 92).

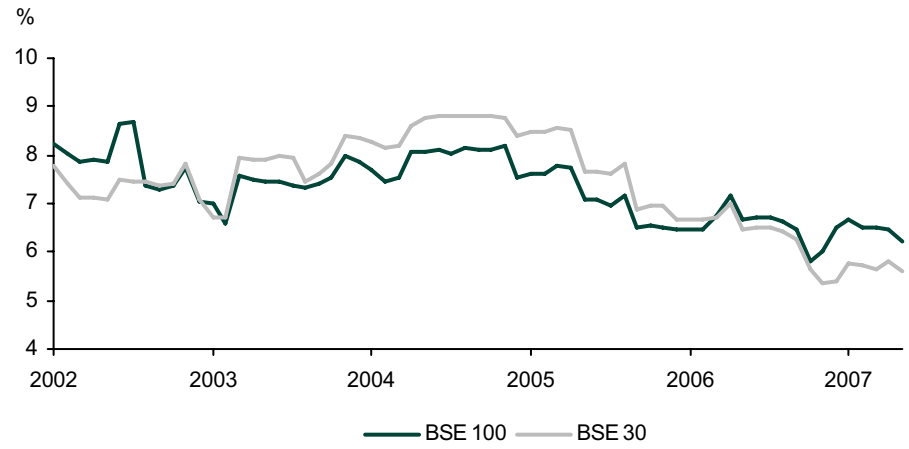
Figure 92. Volatility of monthly returns in India and Emerging Markets



Measured as the 30-month standard deviation of monthly returns on the BSE 100 and FTSE Emerging indices
Source: BSE, FTSE, Datastream, Lehman Brothers.

This follows from a marked paring back of earnings volatility for both the BSE 100 and BSE 30 (Figure 93).

Figure 93. Volatility of monthly earnings growth in India and emerging markets



Measured as the 30-month standard deviation of monthly earnings growth on the BSE 100 and BSE 30 indices
Source: BSE, Lehman Brothers.

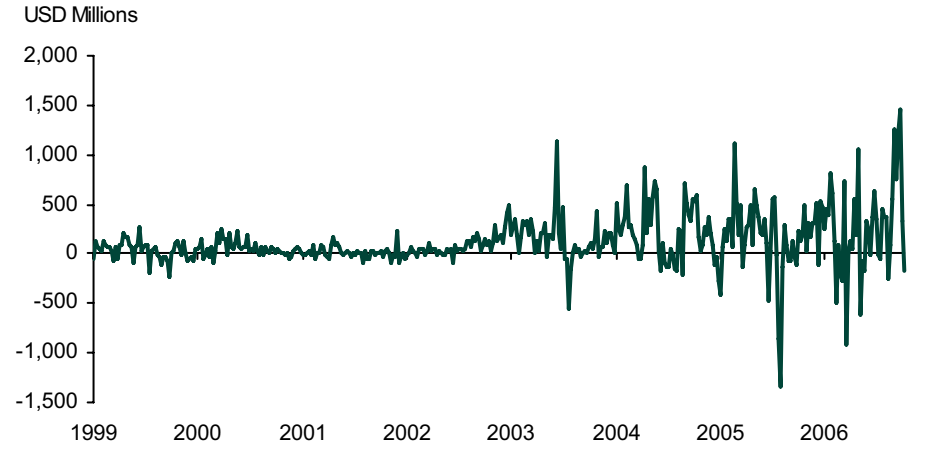
However, from a portfolio perspective, the volatility of relative returns is key. In beta terms, the market has become far more levered to both emerging and global markets. The beta of monthly returns relative to global equities has picked up from 0.32 in July 1997 to 2.1 currently (Figure 94).

Figure 94. Beta of monthly returns of the Indian relative to global markets

Measured as the 30-month rolling regression of monthly returns of the BSE 100 relative to the FTSE World index
Source: BSE, Datastream, FTSE, Lehman Brothers.

The sharp uptick in beta is unsurprising given the increased participation of foreign institutional investors (FIIs) in the domestic market, as restrictions on investment have been relaxed and the market is more mature. FII net inflows have increased tenfold, from a weekly average of US$28m in 1999 to nearly US$300m in 2007 (Figure 95).

Figure 95. Net FII inflows



Measured weekly
Source: SEBI, Bloomberg, Lehman Brothers.

CONCLUSION

Thus, although current static multiples look high, if growth is achieved then stocks are attractively priced even on a risk-adjusted basis. We expect Indian equities to outperform developed and emerging market indices over a five-year horizon.

EQUITY ANALYSIS OF INDIVIDUAL SECTORS

TELECOMMUNICATIONS

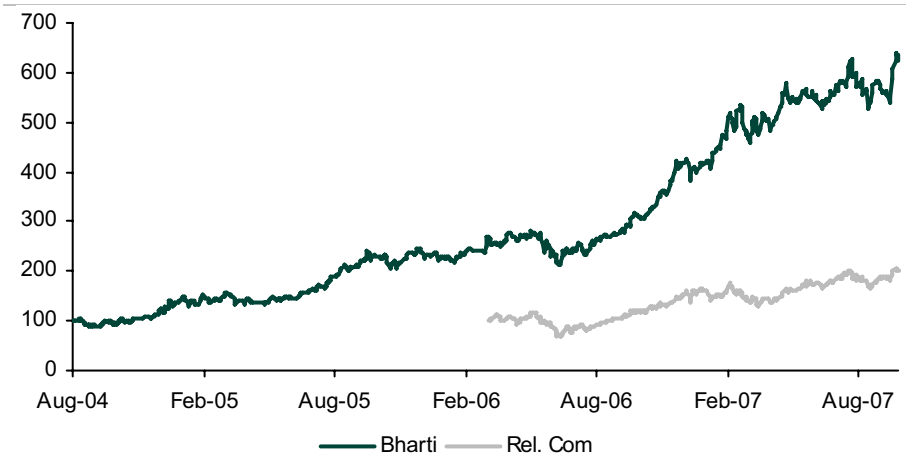
Sundeep Bihani
LBSPL, India
852-2252-6181
sundeep.bihani@lehman.com

Snapshot

Industry market cap	INR3749bn (US$95bn)	**Size estimate**	INR919bn, US$22.4bn (FY07)
Industry ROE	20-35% (FY07)	**5 year historical CAGR**	25.9%
Key listed companies	Bharti Airtel	**Forecast CAGR**	16.2% (FY07-12)
	Reliance Communications		
		Industry/GDP	2.56%
		Current cap utilisation	70-75%

Source: Bloomberg, Lehman Brothers.

Figure 96. Price chart of key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Growth and leverage to higher Indian growth

The telecommunications sector has been one of the fastest-growing in India in 2002-07, driven mainly by wireless expansion. According to the Telecom Regulatory Authority of India (TRAI), at the end of March 2007, India had 165m wireless and 41m wireline connections – a tele-density of 18%. Further monthly additions at 8m have already outpaced connections growth in China. We expect sector revenue growth to remain robust, driven by rapidly increasing disposable income, demographics (large population of young people) and lack of alternate communication media in rural areas. We estimate a 9-10% real GDP growth rate, combined with wireless spending rising from 1.4% to 2.3% of GDP, to drive a threefold increase in total telephone connections over the next five years. We expect this growth to be backed by about US$40bn of capital spending, mainly in rural areas, in 2007-12, also creating significant employment opportunities and rural productivity gains. Such robust growth should promote several new sectors in the handset/equipment manufacturing, mobile content areas and asset/infrastructure services. Meanwhile, household access lines have been stagnant as a result of low return on invested capital (ROICs), although strong IT/ITES growth and global connectivity requirements have driven robust growth in business access lines. We remain positive and expect stronger consumer broadband growth driven by increased urbanization, falling PC prices and higher education standards.

Structure

The Indian wireless sector is fragmented, with 5-6 wireless operators in every province and no restrictions on new entrants, driven by the regulator's desire for a pro-consumer

environment and rural penetration growth. However, a combination of first-mover advantage, rational pricing behaviour and superior execution has led to quasi-consolidation, where the top four operators garner 75-80% of all new wireless subscribers, leading to robust earnings growth. Because of strong operator backing by cash rich conglomerates and international operators, we do not foresee any consolidation. The government is now considering proposals to further stir-up competition, which, if implemented, could dampen the strong earnings growth of the larger operators in the medium term. Meanwhile, the wireline sector remains mostly under government control, with private players focusing on the business and high-end consumer space.

Competition

We rate Indian wireless operators globally competitive on both opex management and capex efficiency. Comparisons with similar-sized operators reveal far lower cost per minute and higher asset productivity. We believe the key driver has been a strong competitive environment with tariffs being the lowest in the world. Bharti Airtel has a cost per minute of US$0.011, 50% lower than operators in China and Indonesia.

Figure 97. Key parameters of some telecom majors

2006	Bharti	China Mobile	China Unicom	Telkomsel
YE subscribers (m)	37.1	301.2	142.4	38.9
Cost per min (US$)	0.011	0.021	0.026	0.023
Subs per employee (k)	3.24	2.88	2.69	9.38
ROE	37%	22%	5%	55%

Source: Company reports.

Opportunity

We expect Indian telecom operators to focus primarily on India over the next few years. In FY07-12, we expect industry revenues to grow at a 16% CAGR, with India emerging as the second-largest telecommunications market by number of subscribers. Rural wireless penetration is still below 10% and, with a population of roughly 700m, should provide an excellent opportunity for these operators to leverage on India's consumption boom. In urban markets, we expect broadband growth to add another layer of revenues to already high wireless usage. We believe that Indian wireless operators have been successful in building low-cost business models that are likely to be exported and replicated in other newly emerging markets as well as a few developed markets globally.

Risks

We would place industry growth risks into three buckets: 1) regulatory; 2) supply-side resource constraints and 3) consumer spending slowdown. Given that telecom is a regulation-heavy sector, any government attempts at tariff controls or mandatory spending could cause a slowdown in capex investments, directly affect sector revenue growth, and, indirectly, even affect potential GDP gains. Supply-side threats are more in the form of spectrum, power and road infrastructure, all of which can drive up the cost of service and keep services out of the reach of the rural user. The third bucket is a mild wireless risk given low service tariffs, but can affect spending on broadband.

Key company profiles

- **Bharti Airtel**: Bharti is the largest private-sector integrated operator by revenue, with more than 40m subscribers. **Market cap – INR 1786bn**.
- **Reliance Communications**: Reliance has 25m subscribers in India and owns FLAG Telecom**.** The company was listed in March 2006. **Market cap – INR 1197bn**
- **BSNL**: BSNL (unlisted) is the government-owned fixed-line incumbent. It has a wireline market share exceeding 90% and is India's fourth-largest wireless operator.

Manish Gunwani
LBSPL, India
91-22-4037-4182
manish.gunwani@lehman.com

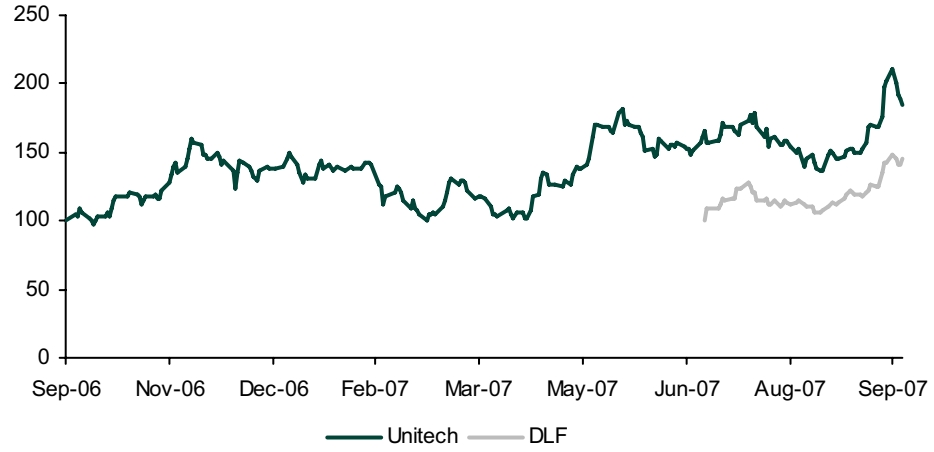
REAL ESTATE

Snapshot

Industry market cap	US$ 50bn	**Size estimate***	INR1620bn, US$40bn
Industry ROE	~50%	**5-year historical CAGR**	NA
		Forecast CAGR	NA
Key listed companies	DLF, Unitech	**Industry/GDP***	4%
		Current cap util	Not Applicable

Source: Bloomberg, Lehman Brothers.
(Much of the industry is unorganized, so these are our rough estimates)*

Figure 98. Price chart of key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks according to market capitalization.

Growth and leverage to higher India growth

The real estate sector is developing rapidly in India. The demand side has robust and sustainable macro drivers across all segments:

- **Residential**: Accounting for more than 70% of the sector in terms of space, residential segment growth is driven by urbanization and the migration of households up the income curve. According to the National Council of Applied Economic Research estimates, the number of urban households earning more than INR 500,000 (about US$12,000) should more than double to 7.6m in 2006-10.
- **Commercial**: Rapid growth in IT/ITES services (manpower in the sector has doubled in the past three years to 1.6m) is the main driver of Grade A commercial office space demand. Jones Lang LaSalle, a property consultancy, estimates that the absorption of office space in the top seven cities in India was 31.1m square feet in 2006.
- **Retail**: According to CRIS INFAC, the penetration of organized retail into the overall market will increase from 3.5% in 2005 to 8% in 2010, thereby driving the demand for mall space.
- **Hospitality**: According to CRISIL, the number of 5-star rooms is expected to grow by 60% in the next four years with foreign tourist arrivals growing at 10% CAGR.

Structure

The real estate industry has historically been fragmented and opaque, but this is changing:

- **Penetration of mortgage finance**: Mortgage disbursals grew by 38% in FY2001-06 and have become an integral part of the buying process. This has helped reduce the unaccounted "cash component" of transactions.
- **Entry of foreign capital**: Regulations governing foreign capital in the sector have been relaxed, motivating developers to become transparent and improve corporate governance.
- **Change in legislation**: In many states, strict laws like the Urban Land Ceiling Act (which defines ceiling of land holdings in urban areas) have been repealed or modified.
- **Consumer preferences**: Consumers are now willing to pay premium prices for better amenities and a good brand. In response, most of the bigger developers are scaling up geographically, which necessitates rigorous systems and processes.

Risks

- **Macroeconomic risks**: Since the sector forms a large part of the savings and capital formation of the country, it is leveraged highly on GDP growth, interest rates, and so on. At present, because of the steep rise in property prices in the past three years and increase in interest rates, affordability has been affected and, consequently, transaction volumes have dropped considerably.
- **Slowdown in IT/ITES**: A slowdown in the US-centric IT services industry could severely affect the industry, especially the commercial segment.
- **Underdeveloped financial markets**: Mortgage loans require lenders with long-term liabilities. However, the debt market in India is underdeveloped, preventing pension funds and insurance companies from being active in the mortgage space. This could hinder growth of mortgage finance and dampen demand.

Key company profiles

- **DLF:** DLF is the largest Indian real estate developer. With six decades of experience, the company has been able to create a strong brand. It has sold approximately 224m sq. ft. of developed area so far, mainly plots. It currently possesses a land bank of about 10,500 acres with a saleable area of approximately 600m sq. ft. Although it is a pan-Indian player with a presence in 32 cities and towns, about 51% of its land bank is in the National Capital Region (NCR) and another 25% in Kolkata. **Market cap – INR 1303bn**
- **Unitech:** Unitech is the second-largest player in the Indian real estate market. Its land bank is approximately the same as DLF's, at 10,500 acres, but with a saleable area of about 500m sqft. Unitech is a pan-Indian player with a presence in cities such as Kolkata, Chennai, Gurgaon, Noida, Greater Noida, Varanasi, Agra. About 25% of its land bank is in Kolkata and another 20% in Chennai. About 22% of its land bank is concentrated in tier-3 cities such as Varanasi and Agra. **Market cap – INR 515bn.**

Prabhat Awasthi
LBSPL, India
91-22-4037-4180
prabhat.awasthi@lehman.com

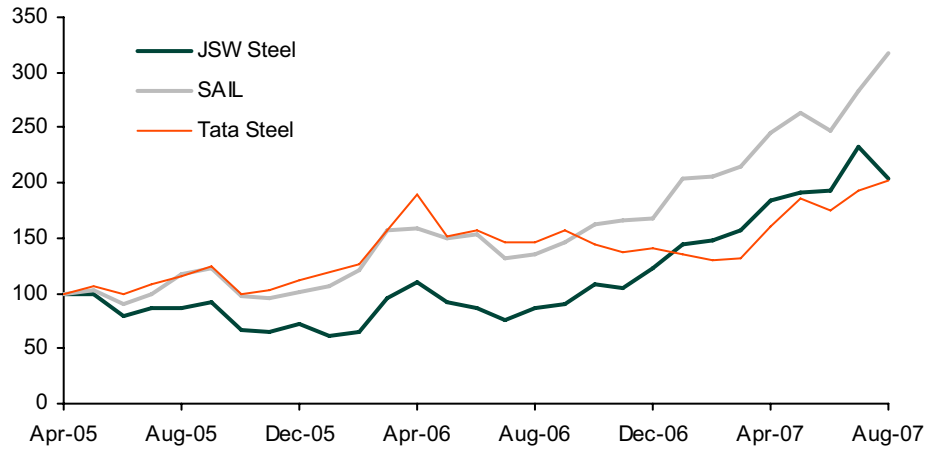
STEEL

Snapshot

Industry market cap	INR 1706.4bn	**Size estimate**	INR1209bn (FY07), US$ 27.9bn
Industry ROE	26.3%	**5-year historical CAGR**	16.1%
Key listed companies	Tata Steel	**Forecast CAGR 5 year**	NA
	Steel Authority of India Ltd	**Industry/GDP [2007]**	4.2%
	JSW Steel	**Current cap util**	Not Available

Source: Bloomberg, Lehman Brothers.

Figure 99. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Booming economy and high Infrastructure spending should fuel growth

The Indian steel sector is growing strongly as a result of the booming economy and heavy infrastructure spending. Sector revenue has grown at a CAGR of 16% in the past five years.

Construction accounts for close to 60% and Autos 28% of total steel consumption in India. Given that we expect Infrastructure and Autos to grow at a CAGR of 20% and 15%, respectively, the steel sector is poised to grow at a healthy pace.

Competition

The Indian steel industry is quite fragmented, with 5-6 primary players and a large number of secondary producers. With prices determined by global markets, competition in the local market is not of material impact in determining prices; the latter follow global price trends.

Opportunities

According to National Steel Policy-1995, consumption of finished steel is expected to grow at a CAGR of 7.5% to 110m tons in FY2020. All the major players have announced large capacity expansion plans for the next 10 years to meet the increased demand. With large increases in raw material prices (iron ore and coal) in the international market over the past three years, Indian players look well placed to benefit from their fully integrated structure (in terms of access to cheap iron ore and in some cases coal). All the new capacities being announced have been assured of captive iron ore mines. With the outlook for steel prices remaining firm, the steel industry is well placed to reap the benefits of India's growth.

Risks

Any downturn in economic growth would likely have a direct negative impact on Indian steel industry. Other potential risks to the sector are high-coking coal prices. India depends on imports for low-ash, high-quality coal. Any negative surprise on that front could slow the expansion plans of the industry.

Key company profiles

- **Steel Authority of India Ltd (SAIL):** SAIL is the largest steel manufacturer in India with a capacity of 13m tpa. It has close to 30% of market share. It has announced plans to increase hot metal capacity to 25m tpa with an investment of more than INR 400bn by 2012. **Market cap – INR 855bn**
- **Tata Steel (TATA)**: TATA steel is the largest private player in the steel sector in India. It has a capacity of 6.8m tpa. With the acquisition of Corus it has become the sixth largest steel producer globally with a capacity of 25m tpa. It has announced plans to expand capacity in India by more than 20m tpa. TATA steel is one of the lowest-cost producers of steel globally. **Market cap – INR 518bn**
- **JSW Steel (JSTL)**: JSW steel is one of the best performing steel companies in India with large capacity expansion plans in the pipeline. It has announced capital expenditure of INR 80,000cr to expand capacity by more than 25m tpa in the next 10 years. **Market cap – INR 140bn**

IT SERVICES

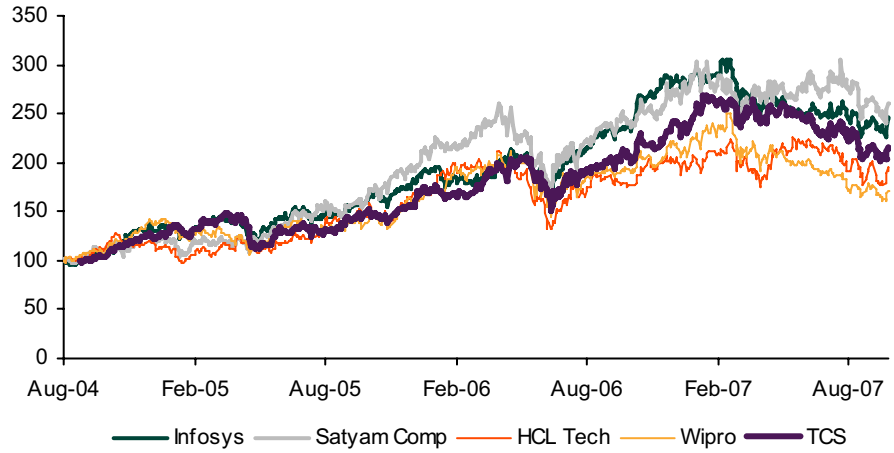
Snapshot

Harmendra Gandhi
LBSPL, India
91-22-4037-4181
hagandhi@lehman.com

Industry market cap	INR 4,122bn US$ 103bn	**Size estimate**	US$39.7bn, INR1600bn
Industry ROE	27.2%	**5-year historical CAGR**	32%
Key listed companies	INFO, TCS, WPRO, SCS, HCLT,	**Forecast CAGR**	23%
		Industry/GDP	4.36%
		Current utilization	76%

Source: Bloomberg, Lehman Brothers.

Figure 100. Price chart of key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Bright growth prospects across verticals

The demand environment remains strong for Tier-1 companies in both offshore mature verticals, including Banking, Financial Services and Insurance (BFSI) and Telecoms, and newer verticals, including Healthcare and Technology, Media, Transportation & Services (TMTS). Demand for off-shoring of IT services and Business Process Outsourcing (BPO) is expected to grow by 20-25% in the next couple of years. Services like Testing, Infrastructure Management Services (IMS) and Package Implementation (PI) will continue to be the growth drivers for IT services off-shoring to India in next three years.

Competition

The IT industry is globally competitive, with better margins and ROE than most companies based in other parts of the world. However, there are MNCs like IBM and Accenture setting up large scale centres in India and trying to match the price structure of Indian companies.

Opportunities

Off-shoring demand for IT services and BPO looks set to grow at 25-30% as estimated by Nasscom, McKinsey and other independent organizations.

Risks

The industry is facing supply-side challenges as demand for engineers continues to rise and average quality intake falls. Additionally, the macro-environment is not very conducive: rupee appreciation continues to erode revenue and margin. Moreover, companies may face pressure on volume growth and pricing if the US slowdown is led by a slowing of BFS. Tax is another factor that could hurt the sector as Software Technology Parks of India (STPI) benefits are to end in FY09.

Key company profiles

- **Infosys:** Infosys leads the IT services sector in India with strong margins (31% EBIDTA margin in FY07) and growth rates (revenue CAGR of 42% in the past three years). The company has a strong presence in large Fortune 1000 customers and a significant training infrastructure with a capacity to train 20,000 people in one year. **Market cap – INR 1083bn**
- **Wipro**: Wipro was one of the pioneers of IT outsourcing in India and has a well diversified revenue base (70% from global IT services, 15% from Asia Pacific IT services and products, and the rest from other businesses like consumer care). **Market cap –INR 671bn**
- **TCS:** TCS has positioned itself as a low-cost service provider and has been able to maintain good margins. It has also managed to attract and retain a large number of employees in a highly competitive hiring environment. Its attrition numbers (after adjusting for its non-standard reporting method) are better than the Tier-1 average numbers. **Market cap – INR 1034bn**
- **HCL Tech:** The company has a diversified presence in BPO (14% of revenues), Infrastructure Management services (13% of revenues), with the remaining revenues coming from software services. Approximately 30% of revenues from software services come from R&D services. **Market cap – INR 199bn**
- **Satyam Computer:** 42% of the company's revenues come from Consulting and Enterprise Business Solutions (CEBS), which involves the implementation and support of Enterprise Resource planning (ERP) systems. **Market cap – INR 296bn**

CEMENT

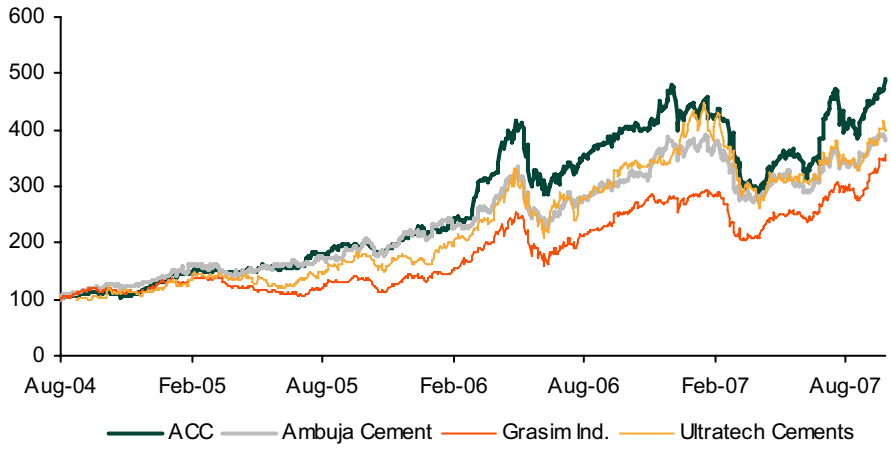
Satish Kumar
LBSPL, India
91-22-4037 4183
satishku@lehman.com

Snapshot

Industry market cap	US$ 21bn	**Size estimate**	US$13bn, INR520bn
Industry ROE	24%	**5-year historical CAGR (volumes)**	8.6%
		5 year historical CAGR (revenue)	32%
Key listed companies	ACC	**Forecast CAGR 5 year (volumes)**	10%
	Grasim industries	**Industry/GDP**	0.6%
	Ambuja cement	**Current cap utilisation**	95% (FY07)
	Ultratech cement		

Source: Bloomberg, Lehman Brothers.

Figure 101. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Growth and leverage to higher India growth

Demand for cement has grown at a healthy CAGR of more than 10% during the past three years on the back of strong demand from end-users. Major demand drivers for cement are as follows:

- Housing
- Infrastructure
- Commercial construction
- Industrial segments.

The Housing sector accounts for approximately 65% of cement demand, with the rest equally shared among other sectors. Demand drops during the July-September monsoon season and picks up after the rains stop.

We expect cement demand growth to remain strong in the next three years, mainly on increasing government expenditure on infrastructure, increased corporate capital expenditure and large-scale development of commercial real estate. Historically, growth in cement demand has had a correlation of 68% with the sum of growth in gross fixed capital formation (GFCF) and government expenditure.

Assuming GDP grows at 9% CAGR for the next five years and the investment to GDP ratio rises to 38% by FY12, we expect demand to grow at a CAGR of 10% in the period.

Competition

The cement industry is very competitive and there have been frequent price wars, mainly because of lower demand. However, as demand has picked up since FY05, competitive intensity has calmed.

In the past, the Indian cement industry was highly fragmented. However, there has been consolidation recently. ACC Limited is the largest cement maker in the country, followed by Ambuja Cement. Both companies are now controlled by Holcim, the Swiss cement major. AV Birla Group controls the next two largest companies: Grasim Industries and Ultratech Cement. The top 10 companies in the country account for about 75% of total installed capacity.

Opportunities

Cement is a cyclical industry. The past two years have been very positive for the industry, but overcapacity may be on the horizon. Over the long term, cement demand should continue to grow at a healthy pace in India and this is reflected in the acquisition of capacities by large multinational players, like Holcim and Lafarge, in India.

Risks

As mentioned earlier, the industry is susceptible to cyclical downturns. However, a structural threat could emerge if Indian GDP growth were to drop. For example, if GDP CAGR for the next five years is 7%, then we would expect cement demand to grow at 8%, which would mean serious overcapacity in the industry and consequently a very benign price outlook.

Key company profiles

- **ACC ltd.**: ACC is the largest and oldest cement manufacturer in India, with a pan-Indian presence. It has total installed capacity of 20m tonnes per annum and plans to take it up to 27m tonnes by 2009 end. Holcim international has a 41% stake in the company. **Market cap – INR 206bn**
- **Ambuja cement:** Ambuja cement is the second-largest cement maker in the country. Its current capacity is 17.5m tonnes per annum, which it has said it plans to take up to 23m tonnes by 2009. Holcim international has a 35% stake in the company. **Market cap – INR 217bn**
- **Grasim Industries:** Grasim is the flagship company of AV Birla group. It has an installed capacity of 15m tonnes per annum, which it plans to increase to 24m tonnes by end FY09. Besides cement, the company is also a world leader in Viscose staple fiber (VSF). The company is also engaged in the business of chemical, sponge iron and textiles. **Market cap – INR 291bn**
- **Ultratech cement:** Ultratech cement is also an AV Birla group company. The AV Birla group acquired it from L&T in 2004. It has an installed capacity of 17m tonnes per annum, which it plans to increase to 21m tonnes by end FY09. **Market cap – INR 121bn**

ENGINEERING GOODS

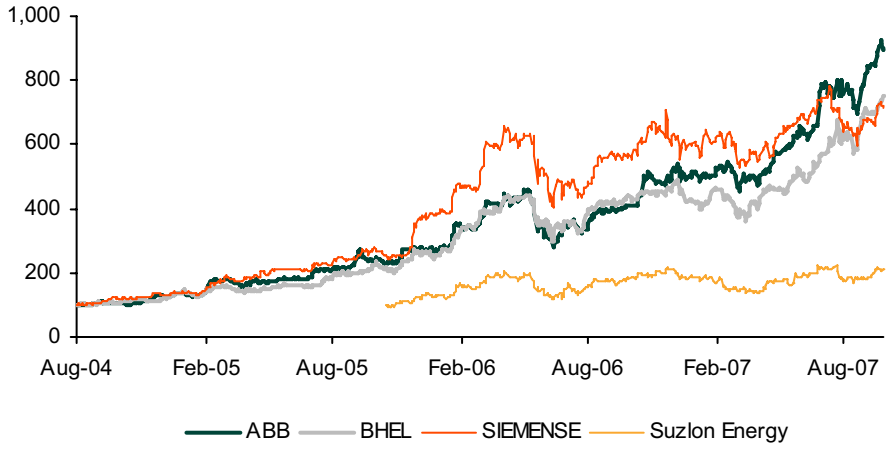
Satish Kumar
LBSPL, India
91-22-4037-4183
satishku@lehman.com

Snapshot

Industry market cap	US$ 58bn	**Size estimate**	US$15bn, INR600bn
Industry ROE	27%	**5-year historical CAGR**	29.7%
Key listed companies	BHEL	**Forecast CAGR 5 year**	20%
	ABB India	**Industry/GDP**	2%
	Siemens India	**Current cap utilisation**	N.A.
	Suzlon energy		

Source: Bloomberg, Lehman Brothers.

Figure 102. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg.
Key stocks are defined according to market capitalisation.

Growth and leverage to higher India growth

India's engineering goods companies are highly leveraged to growth in the economy. The growth of this sector is driven by industrial capex and investment in infrastructure. In the past five years the investment-to-GDP ratio has risen to 33% from 24% and this is reflected in the growth rates of these companies. Another fillip for this sector has come from the increased investment in infrastructure, especially power and roads.

Infrastructure investment is expected to continue to increase in India. If the investment-to-GDP ratio remains strong, we can expect the sector to sustain its high growth rate.

Competition

These companies cater to requirements of industrial and infrastructure sectors. There are companies making electrical equipment, construction equipment, mining equipment, automation products and a host of other products. Although the electrical equipment space is fairly competitive, there is not as much competition in mining equipment. In addition, there are many global players in this sector. Companies like GE, Toshiba, Hitachi and various Chinese companies compete with the Indian companies. Competition is particularly intense in low-tech goods, such as low-voltage electrical equipment.

Opportunities

Opportunities in this sector abound because of the strong industrial capex cycle and continued investment in infrastructure. Industry is stretched for capacities, and margins are also strong. Companies with access to high technology can benefit more as the end users are moving towards higher technology. We also see opportunities emerging in the

alternative energy space. There is much emphasis on the development of alternate energy resources and there could therefore be opportunities across the value chain.

Risks

From a sector point of view, the biggest threat for the industry is a decline in industrial capex or a slowdown in the investment in infrastructure for any reason.

Key company profiles

- **BHEL** (Bharat Heavy Electricals Ltd.): The largest power generation equipment maker in the country. About 65% of total installed power plants run on BHEL-made equipment. The company is a public sector undertaking. **Market cap – INR 910bn**
- **Siemens India**: The Indian subsidiary of German giant Siemens AG. The company is present in power equipment, medical devices, software services, automation products and transportation systems. **Market cap – INR 214bn**
- **ABB India**: ABB India is a subsidiary of Swiss multinational ABB group. The company is a market leader in power transmission and distribution equipments. Besides the company also makes automation systems and products for industrial consumers. **Market cap – INR 256bn**
- **Suzlon Energy ltd**.: Suzlon is one of the world's largest wind turbine manufacturing companies. It is a market leader in India with more than 50% market share. The company also makes wind turbine gearboxes. **Market cap – INR 380bn**

PHARMACEUTICALS

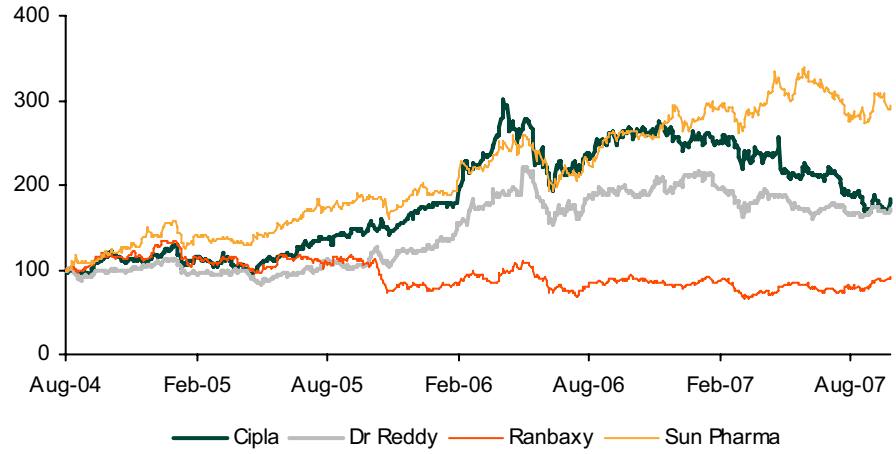
Saion Mukherjee
LBSPL, India
91-22-8037-4184
saion.mukherjee@lehman.com

Snapshot

Industry market cap	INR 1467 bn, US$ 37 bn	**Size estimate**	US$12bn, INR516bn
Industry ROE	20%	**5-year historical revenues CAGR**	15%
Key listed companies	Cipla, Dr Reddy, Ranbaxy	**Forecast CAGR**	15%
	Sun Pharma	**Industry/GDP**	1.6%

Source: Capitaline, Lehman Brothers.

Figure 103. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Indian pharmaceutical market

India is the fourth-largest pharmaceutical market in volume terms (around 8% of global pharma volume) and 15th largest in value terms. The Ministry of Chemicals & Fertilizers estimates the market at US$7.5bn. India is a very fragmented market with more than 20,000 registered units. It is mainly a retail-based branded generic market with 80% of dispensing via pharmacy outlets. Typical of an emerging economy, acute therapy dominates, with 75% of the market. The Indian pharmaceutical industry has had a CAGR of 9.5% in the past five years, but in the past two years growth has accelerated to 14%.

New product introduction has been, and continues to be, a major contributor to growth. Interestingly, the contribution from new product introduction to growth has not diminished since the introduction of pharmaceutical product patents in January 2005. The product patent regime limits the opportunity to reverse engineer and introduce new molecules. This has forced companies to focus on launching novel formulations and combinations. We expect the contribution of new product introduction to growth to decrease over time. We expect industry growth to become more penetration-driven.

India's Pharmaceutical industry looks set to mirror overall economic growth. We expect the industry to grow at 12% over the next three years. Innovation (particularly NDDS, combinations and new formulations), geographic reach and alignment of the product portfolio towards the high-growth chronic segment look set to be key growth drivers. Key participants in the domestic Indian pharmaceuticals market include Ranbaxy, Cipla, GlaxoSmithKline, Nicholas Piramal, and Sun Pharmaceutical.

Indian Pharma—Addressing the global generic opportunity

According to the Ministry of Chemicals & Fertilizers, Indian pharmaceutical companies export drugs worth US$4.5bn. Key export markets are the US, Western Europe and CEE countries, including Russia. India has the most manufacturing facilities approved by the USFDA outside the United States. Indian companies make the largest number of

regulatory filings to the USFDA. Key exporters include: Ranbaxy, Dr Reddy's, Cipla, Sun Pharmaceutical, Lupin and Wockhardt.

Indian Pharma—Addressing the outsourcing opportunity

Some companies are focusing on research and manufacturing outsourcing. India is fast evolving as an outsourcing destination given the abundance of product development, manufacturing and medical skills available in the country. Since the product patent regime was launched in 2005, India's appeal as an outsourcing hub has strengthened. Indian companies that have invested heavily in infrastructure and developing relationships with the innovators include Nicholas Piramal, Divis, Dishman and Jubilant Organosys.

Company profiles

- **Ranbaxy**: Ranbaxy is the largest manufacturer of generic drugs in India with sales of US$1.3bn (CY06). The company has ground operations in 49 countries, the largest presence among Indian companies. The United States is the largest geography, contributing 28% of sales. In terms of prescription drugs, Ranbaxy is the 11th largest generic company in the United States. The branded generic business in emerging markets, including India, contributes 43% of total company revenues. Ranbaxy has one of the largest R&D infrastructures in the country, with more than 1000 scientists. Ranbaxy spends roughly US$100m annually on R&D of which US$25m is spent on innovation research. Ranbaxy files approximately 650-700 generic applications annually worldwide. On the innovation front, it has two New Chemical Entities (NCEs) in clinical development. **Market cap – INR 162bn**
- **Dr Reddy's**: DRRD is India's second largest generic company in terms of sales. DRRD's key markets are the US, India, Russia and Germany. Exports currently contribute 82% of base business revenues (FY07 ex AG and exclusivity upsides). The branded generic emerging markets (including India) contribute 26% of base business revenues. DRRD is the largest third-party API supplier in India, with sales in excess of US$250m. It is also aggressively pursuing opportunities in Contract Research and Manufacturing Services (CRAMS) by using its R&D and manufacturing skills and infrastructure. The company has been active in M&A and much of its recent growth has been acquisition-driven. DRRD has spent US$54m on R&D in FY07. Of this, 45% was on NCE research and specialty projects. DRRD has five NCEs in clinical development. The company is also making investment in biologics; it currently markets two biologics. DRRD has recently launched the first generic version of monoclonal antibody Rutuximab in India. **Market cap – INR 109bn**
- **Sun Pharmaceuticals**: Sun Pharma is sixth largest company in the domestic market and has a strong focus on the chronic therapeutic segment. Sun Pharma's domestic sales have consistently grown above the industry average. According to market research firm CMARC, SUNP ranks number one in prescriptions in may areas. The other key market for SUNP is the United States. Combined, the US and India account for 85% of revenues. As in India, SUNP has delivered consistent growth in the US via product launches and increasing distribution reach. SUNP has recently hived-off and listed its innovation R&D entity, SPARC. **Market cap – INR 191bn**
- **CIPLA**: CIPLA is among the top three pharmaceutical companies in the domestic market. The ORG IMS data put CIPLA's retail market share just below 5%. CIPLA is the largest anti-asthma player in the country with more than 70% market share in the inhaler market. Worldwide, CIPLA is the third-largest inhaler manufacturer. CIPLA continues to invest heavily on inhaler facilities. Anti-AIDS drugs are another forte for CIPLA. It has now emerged as the largest generic ARV producer in the world. Exports accounts for 50% of CIPLA's turnover. Africa and the US are key export geographies. In its export market, CIPLA follows a partnership-based business model. It does not maintain its own front end. Rather, it supplies bulk and finished dosages to its partners, who then market the products. **Market cap – INR 142bn**

CONSTRUCTION AND INFRASTRUCTURE

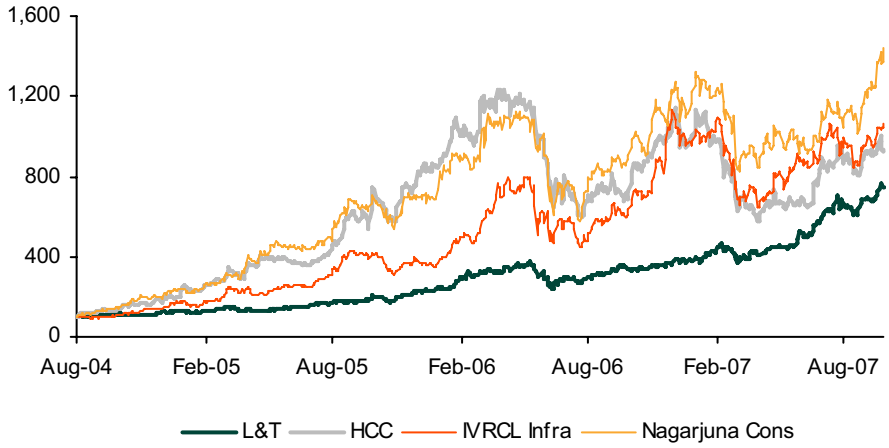
Saion Mukherjee
LBSPL, India
91-22-8037 4184
Saion.mukherjee@lehman.com

Snapshot

Industry market cap	INR 1769 bn, US$ 44 bn	**Size estimate**	US$70bn, INR3000bn
Industry ROE	14%	**5-year historical revenues CAGR**	21%
Key listed companies	Larsen and Toubro,	**Forecast revenues CAGR (3 year)**	30%
	Nagarjuna Construction	**Industry/GDP**	8.5%
	IVRCL Infrastructure,		
	Hindustan Construction		

Source: Bloomberg, Lehman Brothers.

Figure 104. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Indian construction industry

Construction is the second-largest economic activity in India, and spans across several subsectors of the economy. The government has implemented policies which have generated more than 8% growth on average for the past three years. Based on these policies, 9-10% annual growth rate over the next five years seems achievable. The average size of the industry in 2006 was INR3100bn (US$ 70bn).

Sector organization

Currently the sector consists of the following elements:

- Large corporate entities diversified into various sub segments of construction industry such as L&T.
- Developers investing equity capital in construction projects such as GMR.
- Companies engaged in direct construction in specific segments such as HCC.
- Small construction firms.

The complexity and size of contracts should increase as infrastructure spending rises, forcing the primary playing field to shrink to just a few larger, more experienced companies. We expect smaller companies to find it difficult to move up the value chain because of the lack of maturity and entry barriers in the sector, leading to consolidation in the industry over time.

Infrastructure opportunity

To sustain the GDP growth rate at 9% per annum in the medium term, investment in infrastructure would have to be substantially augmented. According to the Government Planning Commission, India would need about US$492bn invested (at 2006/07 prices) in various infrastructure sectors during the Eleventh Five Year Plan (2007-12).

Figure 105. Proposed infrastructure spending 11th Plan

	US$bn	US$bn
Electricity	70.5	150.4
Roads and bridges	31.7	76.1
Railways	20.3	62.2
Ports	1.3	18.0
Airports	2.1	8.5
Telecom	22.5	65.1
Irrigation	32.1	53.1
Water supply & Urban Transport	15.6	48.6
Storage	2.3	5.5
Gas	2.1	5.0
Total	200.5	492.4

Source: Government Planning Commission's consultation paper, 24 September 2007.

Furthermore, the investment in infrastructure would rise gradually from 4.7% of GDP in 2005/06 to 9% by 2011/12.

Risks

- **User Financing**: Infrastructure in coming years may have to be progressively financed by user charges as the government does not have resources to fund the entire expenditure
- **Execution**: The increasing size of projects could force companies to scale up, testing their operational and human resources capabilities.
- **Regulatory environment**: The government can change the sector policies, potentially adversely affecting the growth and industry dynamic.
- **Raw material costs**: Any increase in commodity prices would affect the margins of construction companies.
- **Interest rate risk**: As the projects in this sector are highly leveraged, any sharp increase in interest rates could adversely affect investment plans and, hence, the growth opportunity for construction companies.

Private participation in infrastructure

Given the significant investment required in social infrastructure like health and education, the central government has limited resources for investment in infrastructure. Hence, private participation has a key role in the investments in infrastructure. In the past decade, the Centre and state governments have awarded projects worth US$27bn through the public private partnership (PPP) route. Most of the projects were awarded only in the past three years. The Build-Operate-Transfer BOT opportunity that we expect over the next five years is around US$ 130bn.

Industrial capital expenditure

We project domestic industrial capex to more than double in FY07-09 versus the previous three-year period. This growth would be driven by Indian companies' capacity utilization, which is at a 15-year peak, and their strong balance sheets, with debt-equity ratios at all-time lows. The capex activity will likely remain robust across sectors, notably Metals, Oil & Gas and Autos.

Company profiles

- **Larsen & Toubro**: L&T is the largest engineering and construction company in India, with presence across many sectors, including oil & gas, petrochemicals, metals and other process industries. In the huge infrastructure spending planned across sectors L&T would qualify for most of the projects given its financial strength and technical expertise. **Market cap – INR 805bn**
- **Hindustan Construction Company**: Hindustan Construction Company (HCC) is one of the oldest construction companies in India, with a proven track record. HCC has historically focused on high-end construction work, which has led to margins that are higher than the industry average. HCC has until now preferred to watch BOT from the sidelines and focused only on cash contracts and maintaining higher margins. But infrastructure spending is moving towards a PPP model. HCC is looking at partnering with financial investors for such projects. **Market cap – INR 35bn**
- **Nagarjuna Construction**: Nagarjuna Construction (NJCC) is the second-largest construction company in India after Larsen & Toubro. NJCC has a diversified order book, with a contribution of 45% from roads, 25% from buildings, 9% from the hydropower and irrigation division, 6% from electrical division tapping transmission and distribution. The company is further reducing risk in its order book by venturing into exports. **Market cap – INR 53bn**
- **IVRCL**: IVRC has a predominant position in effluent treatment, water supply, sanitation and irrigation-related projects. IVRC is aggressively pursuing opportunities in roads and transmission and distribution (T&D). The contribution of the roads sector to IVRC's order book has increased from 9% in FY05 to about 30% by fiscal 2007. **Market cap – INR 55bn**

Prabhat Awasthi
LBSPL, India
91-22-4037-4180
prabhat.awasthi@lehman.com

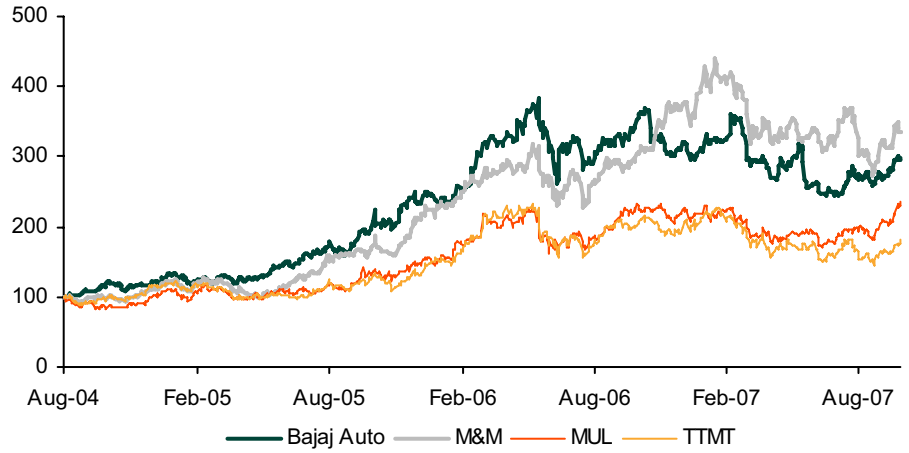
AUTO AND AUTOPARTS

Snapshot

Industry market cap	US$40bn	**Size estimate**	INR1147bn (FY06), US$ 27.9bn
Industry ROE	22%	**5-year historical CAGR**	16%
Key listed companies	Tata Motors	**Forecast CAGR 5 year**	15%
	Maruti Suzuki Limited	**Industry/GDP [2006]**	3.6%
	Mahindra and Mahindra	**Current cap util**	Not Available
	Bajaj Auto		

Source: Capitaline, Lehman Brothers.

Figure 106. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

Growth and leverage to higher India growth

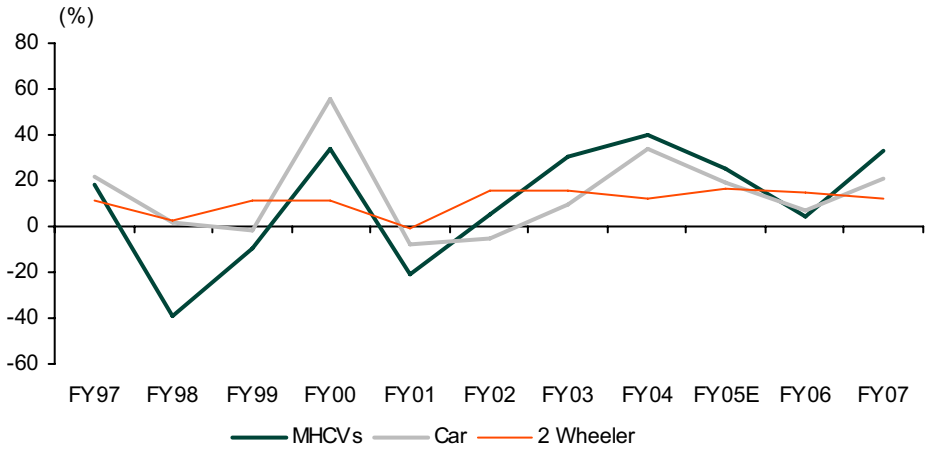
The main categories in India's auto industry are: 1) cars and utility vehicles (UVs); 2) two-wheelers; 3) commercial vehicles; 4) tractors; and 5) auto ancillaries.

Sales of cars and two-wheelers depend on overall growth in incomes, which is related directly to GDP growth. Car sales in India have been growing at a 5-year CAGR of 17.8%. We expect this rate to be sustained or even improved upon as GDP has been growing at a progressively faster rate over the past five years. On our estimates, only 8.5 of every 1,000 people own a car in India. Given this low penetration, we believe that domestic car sales in India could grow at a steady rate of 13% over the next seven years.

Two-wheeler volume sales have been growing steadily at a CAGR 13% for the past 15 years. Some 8.4m two-wheelers were sold in India in fiscal 2007. In the next five years, we think two-wheelers could experience lower growth than in the past because: 1) penetration levels have improved considerably; 2) more players are set to launch more fuel efficient smaller cars; and 3) public transport infrastructure will likely improve.

Commercial vehicle sales depend on industrial production. With the swing in industrial production, commercial vehicles move in a much more volatile cycle as Figure 107 shows. With the strong expansion in industrial production, growth rates have been strong, with a 5-year CAGR of 27.5%. Although near-term interest rate hikes have had an adverse impact on medium and heavy commercial vehicles (MHCV) sales, we expect that the growth rates will pick up and remain strong, along with solid industrial growth generally.

Figure 107. Volume sales growth rates for various Auto segments



Source: Society of Indian Automobile Manufacturers.

Tractor sales have been relatively slow, with a 5-year CAGR of 4.2%, in line with growth in India's agriculture industry. We expect tractor sales to remain slow given already high penetration and low growth rate in the agricultural sector.

Auto ancillaries leverage on overall growth in auto sales, which we expect to remain strong in India. This industry is very fragmented. Many of these players will struggle to scale up and we thus see the potential for M&A activity in this space.

Competition

The top three Auto OEMs in India (in terms of market share) in each of the segments commercial vehicles, two-wheelers and cars command more than 80% market share. New entrants, especially those from outside the country, find it very difficult to make headway in India. The reason for this is that their products are mostly unsuitable for Indian conditions and do not match Indian consumers' needs. Moreover, India is composed of a number of smaller markets with different local languages and cultures, complicating matters further for outside entrants.

Opportunities

India has developed considerable expertise in manufacturing small cars. More than 80% of the 1.2m cars sold in India are small. Many players, including Suzuki, Hyundai, Renault, Nissan and Toyota have plans to develop India into small-car manufacturing hubs. Two-wheel and commercial vehicle players are increasingly looking at exporting their products to similar markets worldwide. Indians have been catching up on the technology curve and have the expertise to compete on this basis.

Risks

Any downturn in economic growth would hurt India's auto industry. Moreover, interest rates and the availability of credit have a huge impact on auto sales as 90% of CVs, 80% of cars and 60% of two-wheeler sales are acquired with financing.

Key company profiles

- **Tata Motors (TTMT)**: TTMT is the market leader in commercial vehicles, with more than 60% market share in commercial vehicles. It also manufactures cars and has a nearly 15% market share in this area. It plans to launch (in 2008) the cheapest car in the world with a price tag of US$2,500. **Market cap – INR 267 bn**
- **Maruti Suzuki Limited (MUL)**: MUL is the market leader in cars, with a market share of more than 50%. MUL has maintained a strong hold on the Indian market over the past few years, despite the entry of new players. **Market cap – INR 252 bn**

- **Mahindra and Mahindra (MM)**: MM is a conglomerate. The parent manufactures three-wheelers, tractors, UVs and LCVs (Light commercial vehicles). It has entered into a JV with Renault to make cars. It also plans to develop MHCVs (Medium and heavy commercial vehicles) and is also heavily focused on the Auto ancillary business, with acquisitions in India and abroad. **Market cap – INR 173 bn**
- **Bajaj Auto (BJA)**: BJA is the second largest player in the two wheeler space. It has strong in-house R&D capability and has been able to obtain patents for its products. It is also involved in the Life and General Insurance business and plans to de-merge its various businesses into separate units. **Market cap – INR 235 bn**

FINANCIAL SERVICES

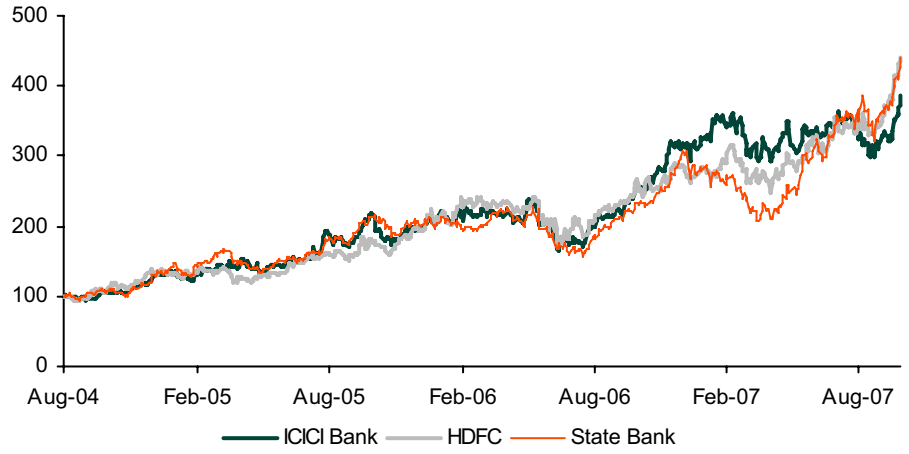
Snapshot

Srikanth Vadlamani
LBSPL, India
91-22-4037-4191
srikanth.vadlamani@lehman.com

Industry market cap	INR5,865bn US$ 145 bn	**Size estimate (Outstanding advances of the banking system)**	INR19,231bn US$ 475bn
Industry ROE	16%	**5 year historical CAGR**	24%
Key listed companies	ICICI Bank, HDFC, State Bank of India	**Forecast CAGR – 5yr**	23%
		Industry/GDP	6.1%
		Current cap util	NA

Source: Bloomberg, Lehman Brothers.

Figure 108. Price chart for key stocks in the industry (indexed to 100)



Source: Bloomberg. Key stocks are defined according to market capitalisation.

The growth opportunity

Strong economic growth is set to open significant opportunities for financial services. We foresee growth in terms of product range as well as new customers.

Notwithstanding the current sluggishness, we expect retail banking to offer the biggest growth opportunity. With continued demand for housing, we expect a secular increase in mortgage financing. Another low-hanging fruit is the wealth management opportunities being driven by the burgeoning middle class. Ancillary financial services, including insurance, asset management and stock broking will likely be growth drivers, too. In our view, however, the big opportunity lies in increasing the penetration of financial services. Major players are already successfully running programmes tailored to target hitherto ignored low-income segments. As players refine their delivery systems, we expect this segment to be a major driver of growth for the sector.

In the wholesale/corporate segment, we believe that the Indian market will increasingly mimic more advanced markets. We expect financial disintermediation in terms of corporates directly tapping the bond markets – either Indian or foreign – to be a significant trend. We recognize that the current nascent stage of the domestic bond market will likely be an impediment, but we expect this to change in the medium term. Concomitantly, we expect the structured finance market to develop, bringing fee-income opportunities for the sector. We believe that growth in retail finance, especially in mortgages, in the medium term will depend on a functioning structured finance/bond market. This could motivate regulators to be proactive in developing these markets.

A more liberalized approach in allowing foreign money into the debt markets would clearly be a material positive in providing liquidity to these markets. However, we expect the regulators to be cautious in this area, taking only small steps.

Industry structure and its possible evolution

The industry is currently dominated by banks. We expect this to remain the case, although we believe that non-banks with proven models and strong managements will also thrive.

Among banks, the degree of concentration is low. This is primarily a legacy issue, as the sector was once dominated by a large number of state-owned banks. We expect the state-owned banks to continue to lose market share. However, we believe that there is enough strength in their franchise to allow them to survive, albeit with a much lower market share. A key trend we foresee in the state-owned space is the folding up of the smaller state-owned banks into the top-5 groups.

One defining trigger of the industry structure could be the opening of the sector to foreign players, expected after 2009. Given the regulatory regime in India, we would expect acquisitions to be their preferred entry route. This could trigger a wave of consolidation. However, we would not expect such a wave of consolidation to lower the competitive intensity in the sector. On the contrary, we would expect to see a large number of strong well-managed participants in the market for the long term.

Risks

Retail credit is seeing very strong growth and we expect this trend to continue. This segment is relatively nascent in India and has not witnessed a full economic cycle. Hence, a key risk could be bad loans coming in at a rate greater than what has been priced into the product.

Growth in some of the emerging segments, including insurance, and asset management is being driven largely by the uptick in the equity markets. Hence, any prolonged weakness in the equity markets is a key risk for growth in these segments.

Key company profiles

- **ICICI Bank**. The ICICI group is the market leader in all the key growth segments: retail finance, insurance, structured finance, asset management. **Market cap – INR 1143bn**
- **HDFC group**. The HDFC group has a presence in all the major segments of the financial spectrum. The parent HDFC is a major player in the mortgage market, while HDFC Bank has a presence in both retail and wholesale banking. The group has a strong presence in insurance and asset management as well. **Market cap – INR 685bn**
- **State Bank of India:** Currently the largest banking group in the country. The company is poised to continue to be a major player in the Indian financial services sector, because of the sheer scale of its franchise, with by far the largest branch network, and a strong brand. The group is now building a strong presence in insurance and asset management. **Market cap – INR 1027bn**

CONSUMER GOODS

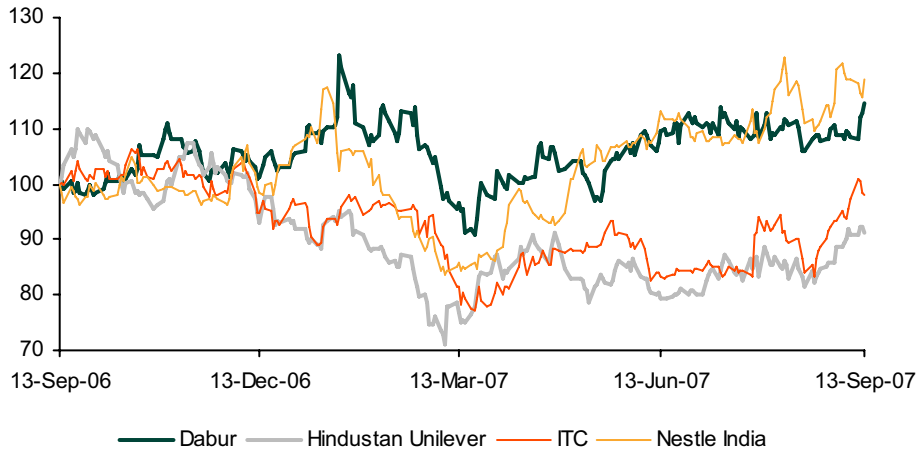
Manish Jain
LBSPL, India
91-22-4037-4186
manish.jain@lehman.com

Snapshot

Industry market cap	US$ 45bn	**Size estimate***	INR750bn, US$18bn
Industry ROE	~32%	**5-year historical CAGR**	NA
Key listed companies	Hindustan Unilever	**Forecast CAGR**	NA
	ITC Limited.	**Industry/GDP***	2%
	Nestle	**Current cap util**	NA
	Dabur		

Source: Bloomberg, Lehman Brothers.
** Because a significant part of the industry is unorganized, these are our estimates for branded consumer goods products.*

Figure 109. Price chart for key stocks in the industry



Source: Bloomberg, Lehman Brothers.
Key stocks are defined according to market capitalisation.

Industry on an upward trend

The consumer goods industry in India is on an upturn, led by rising disposable income and the changing lifestyle of the urban consumer.

The upturn has accelerated the top-line growth of almost all consumer goods players.

Figure 110. Accelerating growth momentum at HLL and ITC

Company	Sales FY02-04 CAGR	Sales FY04-07 CAGR
HLL (CY06)	-2.9%	5.5%
ITC (FY07)	9.6%	18.2%

Source: Capitaline, Lehman Brothers.
(Note – average GDP growth in 2002-2004 was 6% while in 2004-2007 was 8.6%, CY06=FY07)

Low penetration should favour long-term growth. For example, even for a large and mature category like shampoos, penetration is just 38%.

Figure 111. Consumer goods – penetration by category

Category	All India	Urban	Rural
Deodorants	2.1	5.5	0.6
Toothpaste	48.6	74.9	37.6
Shampoos	38.0	52.1	31.9
Instant Coffee	6.6	15.5	2.8
Toilet Soaps	91.5	97.4	88.9

Source: Industry data, Lehman Brothers.

Modern retail trade looks set to be a big factor in shaping the sector. According to research agency CRIS INFAC, the penetration of organized retail into the overall market will increase from 3.5% in 2005 to 8% in 2010. However, the impact of organized retail on the margins of consumer goods companies will depend on the size of the producer and the brand strength of the product involved.

Pricing power is returning. Pricing power seems to be returning in the consumer goods industry after a tough period in 2002-2006. Some of the recent prominent price hikes, like the 5-7% increase in soap prices by Godrej, have all been easily absorbed.

Risks

- Macroeconomic risks: Growth of the consumer goods industry has traditionally been closely linked to growth in the economy. Furthermore, with a large portion of demand coming from rural markets, any slowdown in farm incomes would put pressure on industry growth.
- Rising raw material prices: Escalating costs of inputs such as vegetable oils, milk and wheat, are becoming a challenge for most players in the industry.

Key company profiles

- **HUL:** HUL, part of the Unilever group, is one of the largest players in the Indian consumer goods space. The company was the first entrant in the Indian organized consumer goods space. HUL currently leads in most of the bigger categories, including fabric care, personal hygiene, shampoos and skin care. HUL's brands – including Lifebuoy, Lux, Surf, Rin, Fair & Lovely, Pond's, Sunsilk, Clinic, Pepsodent, Close-up and Lakme – are household names across the country. **Market cap – INR 484bn**
- **ITC Limited:** ITC Limited is one of India's foremost private sector companies. While ITC is a market leader in its traditional businesses of cigarettes, it is rapidly expanding its presence even in its nascent businesses of packaged foods & confectionery, branded apparel and greeting cards. **Market cap – INR 714bn**
- **Nestle:** Nestle India is a subsidiary of Nestlé S.A. of Switzerland and has been present in the Indian markets since 1912. The company is a leader in the foods space and its key brands include Maggi, Kit Kat, Milkmaid and Nescafe. In recent years it has also introduced products of daily consumption such as Nestle Milk, Nestle Slim Milk and Nestle Fresh 'n' Natural Dahi. **Market cap – INR 128bn**
- **Dabur**: Dabur is one of India's leading consumer goods players in the health care, personal care and food products. Some of the key brands include Hajmola, Promise, Babool, Meswak, Vatika and Real. **Market cap –INR 91bn**

NON-FERROUS METALS

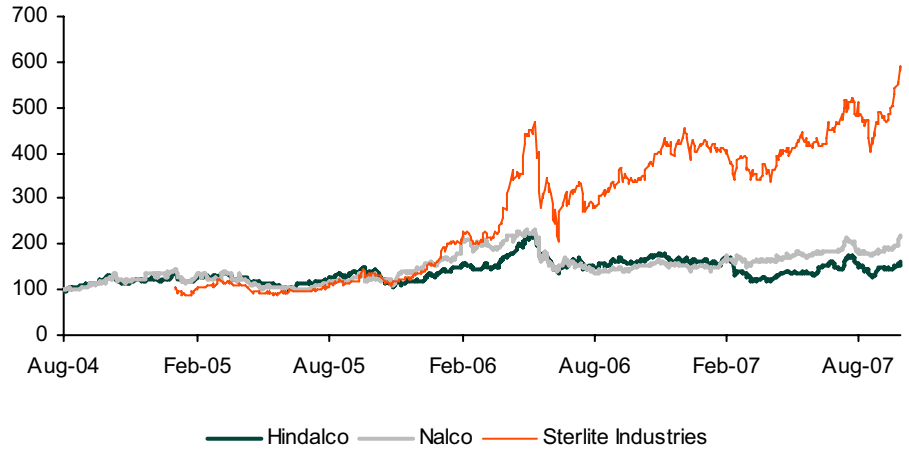
Prabhat Awasthi
LBSPL, India
91-22-4037-4180
prabhat.awasthi@lehman.com

Snapshot

Industry market cap	INR1225bn	**Size estimate**	INR501bn (FY07), US$ 12.2bn
Industry ROE	22.2%	**5 year historical CAGR**	26.5%
Key listed companies	Hindustan Aluminum	**Forecast CAGR 5-year**	NA
	National Aluminum	**Industry/GDP [2006]**	3.6%
	Sterlite Industries India Ltd	**Current cap util**	Not Available

Source: Bloomberg, Lehman Brothers.

Figure 112. Price for key stocks in the industry



Source: Bloomberg, Lehman Brothers. Key stocks are defined according to market capitalisation.

Economy set to fuel metal growth

This sector includes aluminium, zinc, copper and lead producers. Metals have been one of the major beneficiaries of the burgeoning economy and heavy infrastructure development. All metals have seen healthy growth in volumes in the past few years.

India consumed c.1m tons of Aluminium in FY06 with demand growing at a CAGR of 11.8% in FY2002-06. Electrical, transport and construction are the three largest consumers of aluminium and account for nearly 71% of total consumption. Revenues for the sector have grown at a CAGR of 29% in FY2002-07. The demand for the sector is expected to grow rapidly on the back of high growth in all the three major consuming sectors.

Copper consumption in India grew at a CAGR of 8% to 437,300 tons in FY07 from 298,000 tons in FY02. Telecom and power together are more than 55% of total copper demand. With Telecom sector coverage increasing rapidly and rising investment in the power sector, we can expect a rapid growth in copper demand.

Zinc consumption in India has risen from 347,000 tons in FY04 to 460,000 tons in FY07 – a CAGR of 9.9%. The steel sector is the largest consumer of zinc, approximately 70% of total demand, for galvanized products. We expect demand for zinc to remain firm on the back of a booming economy.

Competition

India's non-ferrous sector does not have many players. But since prices are generally linked to London Metal Exchange prices, industry structure has little effect on it. At the same time, domestic/demand supply does affect prices in the short term.

Opportunities

India still has very low per capita consumption of metals relative to developed countries or even China. With the economy expected to grow at a healthy rate and a construction boom taking place, metal demand should also grow rapidly. Companies have announced capital expenditure of US$11bn for the next five years. With healthy bauxite and zinc reserves, we think Indian players are in a good position to take advantage of integration.

Risks

Any downturn in global economic growth would have a negative impact on the Indian non-ferrous sector. In addition, any delays to power projects could affect smaller players without captive plants.

Key company profiles

- **Hindalco (HNDL)**: HINDALCO is the largest fully integrated aluminium producer in India. It is also one of the largest producers of copper in India. It has announced expenditure of more than INR 300bn by 2012 to expand its capacity. **Market cap – INR 211 bn**
- **National Aluminium Company (NALC)**: NALCO is the largest public sector unit, with a capacity of 450,000 tpa of aluminium. It is working on capacity expansion plans with an investment of INR 40 bn in the next two years. **Market cap – INR 194 bn**
- **Sterlite Industries India Ltd (STLT)**: Sterlite has a presence in copper as well as in aluminium and zinc. It owns a 51% stake in BALCO and a 65% stake in Hindustan Zinc. Both these companies were acquired in the government's disinvestment programme. Sterlite has an option to buy the government's remaining stake in both companies. **Market cap –INR 530 bn**

AN INTERNATIONAL PERSPECTIVE ON THE INDIAN DEBT MARKET

INTRODUCTION

Jack Malvey, CFA
1-212-526-6686
jmalvey@lehman.com

Joseph DiCenso, CFA
1-212-526-2288
jdicenso@lehman.com

Few global debt portfolios regularly employ Indian debt as of 2007. This will soon change.

During the coming decade of the "Teens", India is set to become a mainstay of the international debt portfolio choice set. And by the decade of the "Twenties", if not sooner, India will rank between the fifth and the tenth largest bond market in the world.

Given India's coming prominence in the world debt markets, international debt investors need to begin to prepare now to eventually include India in their portfolios. And given its rapidly growing position in the world economy, a thorough analysis of global economic and capital market prospects is impossible without a full consideration of India's dynamic role.

The strategic outlook for India's economy is very bright indeed. But India's prodigious 21st century growth will demand stout capital accumulation, an essential fuel for sustained economic development. Capital will be supplied by hearty domestic savings and by accessing the vast international financial markets. Both the accumulation and optimal deployment of capital will be aided by India's swift progression towards an advanced capital market architecture, a process already well underway.

Reinforcing the promise of vigorous Indian long-term economic growth, the timing of India's full entry onto the world capital market stage could hardly be more propitious. A century after a similar wave of globalisation, the late 20th and early 21st centuries will be recalled for the exceptional pace of mainstreaming India, China and other populous developing nations into the world capital markets.

On the verge of meeting all investment guideline requirements, Indian debt is about to become a staple of international debt portfolios. Thanks to an ongoing revolution in asset management philosophy in the pursuit of higher absolute total return and increased negative correlations among asset class holdings, there has been an institutional investor stampede to new investment vehicles. In particular, the embrace of geographic portfolio diversification has become a favourite tactic, as evidenced by the outsized performance of the emerging market (EM) debt class. Even with difficult global credit market conditions in July and August 2007, the Lehman EM debt index has cumulatively outperformed all other members of the world debt asset class during this decade with an annualised 11.39% total return for this first decade of the 21st century (January 2000 to 31 August 2007).

A monumental milestone looms for the world capital markets and for India. Before the end of the upcoming decade of the "Teens", if not sooner, the combination of full rupee currency convertibility and existing investment-grade rating status (Baa2/BBB-/BBB-, Fx ratings by Moody's/S&P/Fitch respectively in August 2007) will channel Indian government, corporate, and securitised debt into widely used global debt index benchmarks like the Lehman Global Aggregate Index (with more than US$2.0 trillion run against it as of mid-2007) and facilitate the widespread use of Indian debt in international portfolios.

Although the ownership of out-of-index securities can provide outperformance opportunities for institutional investors with fewer portfolio constraints, many investment mandates explicitly prohibit and/or limit the ownership of non-benchmark index issues. The full internationalisation of local currency debt markets, as manifest by their inclusion in widely used international debt indices, often serves as a spur to greater product development such as new debt structures and securitisation; and it can lead to a lower cost of debt capital, a deeper investor base, a faster rate of disintermediation and a more efficient allocation of capital Þ all demonstrable contributors to economic growth.

There is also ample evidence of a "virtuous index effect" in debt markets akin to the equity price boost afforded to new company members of widely followed equity indices. For example, on 1 January 2005 Lehman added eight new countries to its Global Aggregate Index. Each new country handily beat the overall Global Agg benchmark's 3.30% total return during 2005: Mexico (15.37%); South Africa (10.63%); Chile (5.73%); Czech (6.11%); Hungary (8.97%); Poland (9.52%); Slovakia (6.11%); and Slovenia (7.64%).

ON THE ROAD TO FULL GLOBAL DEBT CAPITAL MARKET INTEGRATION

A prerequisite: Full FX convertibility

As part of a managed floating currency regime, India maintains capital controls. On the current account, there have been no currency conversion restrictions hindering buying or selling foreign exchange since 1994 (though trade barriers still exist). So-called foreign institutional investors (FII) enjoy convertibility to bring money in and out of the country and buy securities; but the capital account also suffers from myriad quantitative restrictions. Although local firms are able to take capital out of the country in order to expand globally, households remain highly constrained in their ability to diversify globally.[92]

At a May 2007 India-Europe Investment Forum, Indian Finance Minister Chidambaram suggested that the rupee would soon be fully convertible and underscored the de facto convertibility already in place on the capital account.[93]

Restrictions on currency hedging also constrain the full mainstreaming of Indian debt into the international portfolios of global debt managers. Indian companies can currently hedge using over-the-counter currency options, swaps and forwards; but turnover is low because of rupee capital account restrictions. The Reserve Bank of India (RBI) is under pressure to allow rupee futures trading following the listing of a non-deliverable futures (NDF) contract in Dubai (which is settled in US dollars). See IRD1 <Currency> on Bloomberg.

BUILDING THE INDIAN DEBT CAPITAL MARKET ARCHITECTURE: A STRATEGIC PROCESS WELL UNDERWAY[94]

Money markets: A functioning repo framework

The Indian Government bond market is the third largest in Asia (after Japan and South Korea). Some of the key reforms introduced since 1992 include:

- The auction system for the sale of government securities was introduced in 1992;
- The Primary Dealership system was initiated in 1995;
- The Wholesale Debt Market segment has been set up at the National Stock Exchange to promote transparency; and,
- Automatic monetisation through the issue of ad hoc T-bills was ended.

Over time, the degree of monetisation of deficits has fallen significantly, lowering long-term inflation expectations and increasing appetite for longer-dated paper. As in developed debt markets, the maturity profile of government debt has extended.

Still, the investor base remains narrow and state-run banks dominate the market. The low duration of liabilities of banks limits their ability increasingly to absorb longer-dated paper. And there is a need to broaden the investor base. Although the market has been

[92] *See RBI website FAQ: http://www.rbi.org.in/scripts/FAQView.aspx?Id=34*
[93] *Address by Dr. Rakesh Mohan, Deputy Governor, Reserve Bank of India at the First Indian-French Financial Forum in Mumbai on May 16, 2007. http://www.rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=8478#ann3*
[94] *See footnote 92.*

opened somewhat to international investors, Indian authorities remain cautious about non-local institutional participation in the Indian debt market.

Further evidence of financial market deepening included new instruments, such as collateralised borrowing and lending obligations (CBLO).

Key details

- Issuance norms and maturity profiles of other money market instruments such as commercial paper (CP) and certificate of deposits (CDs) has been modified to encourage wider participation ;
- Ad hoc Treasury Bills have been abolished and regular auctions of Treasury Bills introduced;
- The RBI switched emphasis to setting prudent limits on borrowing and lending in the call money market, encouraging migration towards the collateralised segments and developing derivative instruments for hedging market risks;
- The institutionalisation of the Clearing Corporation of India Limited (CCIL) as a central counterparty has been undertaken; and,
- The upgrading of payment system technologies has also enabled market participants to improve their asset liability management.

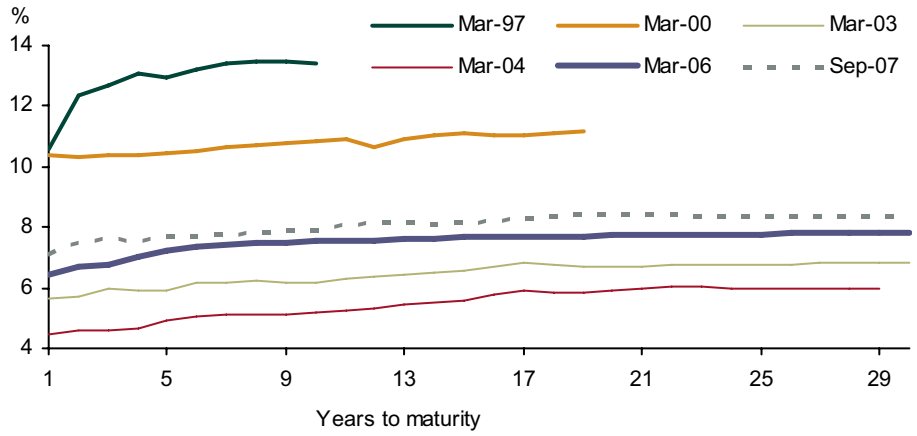
These developments fostered lower volatility in call rates and narrower bid-ask spreads in the call money market, allowing reforms in longer-term debt markets.

Indian government bond market reforms in the 1990s and the "oughts"

The 1990s witnessed a number of encouraging developments:

- An auction system for issuance of government securities was introduced;
- Statutory prescription for banks' investments in government and other approved securities has been scaled down from the peak level in February 1992 to the statutory minimum level of 25% by April 1997. Focus has shifted towards the widening of the investor base;
- Without unconstrained recourse by the Government to the Reserve Bank through automatic monetisation of deficits and conversion of non-marketable securities to marketable securities, the RBI gained more operational freedom;
- The RBI pursued a strategy of passive consolidation of debt by raising progressively a higher share of market borrowings through re-issuances. This has produced a critical mass in key maturities and has facilitated the emergence of market benchmarks;
- Improvement in overall macroeconomic and monetary management resulted in lower inflation, lower inflation expectations, and price stability, thereby promoting a longer-maturity yield curve, now up to 30 years (Figure 113); and,
- The RBI strengthened the technological infrastructure for trading and settlement.

Figure 113. Yield curve movement – SGL (Subsidiary General Ledger) transactions



Source: RBI, Reuters and Lehman Brothers.

More recent reforms in the "oughts" include:

- Intra-day short selling in government securities has been permitted among eligible participants – i.e., scheduled commercial banks (SCBs) and primary dealers (PDs) – in February 2006;
- Guidelines for trading in when issued "WI" market were issued by the RBI in May 2006;
- Short positions have been permitted beyond intra-day for a period of five trading days, effective 31 January 2007;
- FIIs are now allowed to invest in government securities, subject to certain limits;
- Automated screen-based trading in government securities has been introduced through a Negotiated Dealing System (NDS);
- A risk-free payments and settlement system in government securities through the Clearing Corporation of India Limited (CCIL) has been set up;
- A Real Time Gross Settlement System (RTGS) is being phased in;
- Trading in government securities on stock exchanges for promoting retailing in such securities has been introduced, permitting non-banks to participate in the repo market; and,
- NDS-OM and T+1 settlement norms have been introduced.

A MID-2007 SNAPSHOT OF THE INDIAN GOVERNMENT BOND MARKET: STYLISED FACTS, PERFORMANCE, AND GLOBAL COMPARISONS

After six rate hikes by the RBI since the beginning of 2006, the repo rate climbed to 7.75% as of early August 2007. As a result, Indian government debt returns were only 0.55% in the first half of 2007.

However, the Indian yield curve rallied significantly in July 2007, along with other global government yield curves, in response to the upward reset of global credit risk premia. In addition, slower second-half growth and falling inflation permitted a cessation of interest rate hikes, even if only temporarily. This brought India's 10-year rates down to 30bp to 7.85% and raised the year-to-date total return for its government bond market to 3.28% through 31 July. Over the same seven-month period, Indian government returns outpaced US Treasuries (2.69%), euro governments (-0.32%), Japanese governments

(0.19%) and Chinese governments (-2.55%) in local currency terms according to the Lehman Global Family of Indices.

- Two-thirds of our Indian Government Index's INR8.98 trillion market value resides in short and intermediate paper, with the largest concentrations in the 7-10 year sector (28%) and 10-20 year maturities (21%).
- This is a relatively long-duration index (6.02 years) compared to US Treasuries (4.88 years); but it is only slightly longer than the worldwide average (5.85 years for the Lehman Global Treasury Index) and very close to other major debt markets – eurozone (6.06 years) and Japan (6.05 years).
- Without any prepayment-sensitive or callable securities in the Indian Government Index, Indian Treasuries exhibit positive convexity: 0.64, in line with the Global Treasury average of 0.70.
- In US dollar terms, Indian Treasuries represent a sizeable local market. If eligible for inclusion in the Global Aggregate, then India would rank as the seventh largest with a US$218.3bn market value, just behind Korea. (Note: The Lehman Chinese Treasury Index is slightly larger with a US$256bn market value and the overall Chinese bond market is approximately US$567bn). Still, India would account for less than 1% of the US$24 trillion world bond market as measured by the Lehman Global Family of Indices.

Figure 114. Lehman Indian government bond index: July 31, 2007

							Total return (%) in INR		
	Amount outstanding (billion INR)	Market value (billion INR))	% market value	Duration	Convexity	Average coupon	YTD	Past 3 months	Past 6 months
India Govt. index	8,624	8,976		6.02	0.64	8.56	3.28	4.40	4.16
Intermediate	5,503	5,900	66%	4.46	0.30	8.99	4.51	4.51	4.65
Long	3,121	3,076	34%	9.00	1.29	7.81	1.36	4.20	3.31
1-3 Yr	1,071	1,138	13%	1.89	0.05	9.46	4.77	3.38	4.67
3-5 Yr	1,101	1,210	13%	3.39	0.15	9.93	4.83	4.52	4.95
5-7 Yr	961	1,026	11%	4.65	0.28	8.47	4.76	4.84	4.82
7-10 Yr	2,371	2,526	28%	6.06	0.48	8.55	3.98	4.75	4.29
10-20 Yr	1,864	1,905	21%	8.06	0.94	8.05	2.68	4.64	4.11
20+ Yr	1,257	1,171	13%	10.53	1.86	7.45	-1.48	3.46	1.80

Source: Lehman Brothers Fixed-Income Research.

Figure 115. Pro forma Lehman Global Aggregate and Multiverse Indices with India and China: July 31, 2007

Global Aggregate Index (all investment-grade)				Multiverse Index (all quality tiers)			
Ranking	**Currency bloc**	**Market value (US$bn)**	**% Market value**	**Ranking**	**Currency bloc**	**Market value (US$bn)**	**% market value**
	Global Aggregate Index	24713	100%		Multiverse Index	25692	100%
1	U.S.	9272	38%	1	U.S.	10,113	39%
2	Eurozone	7516	30%	2	Eurozone	7,639	30%
3	Japan	3891	16%	3	Japan	3,891	15%
4	U.K.	1388	6%	4	U.K.	1,403	5%
5	Canada	588	2%	5	Canada	588	2%
6	China	567	2%	7	China	567	2%
7	Korea	333	1%	6	Korea	333	1%
8	India	222	1%	8	India	222	1%
9	Sweden	166	1%	9	Sweden	166	1%
10	Australia	130	1%	10	Australia	130	1%
11	Denmark	110	0%	11	Denmark	110	0%
12	Taiwan	101	0%	12	Taiwan	101	0%
13	Poland	85	0%	13	Poland	85	0%
14	Mexico	71	0%	14	Mexico	71	0%
15	S. Africa	60	0%	15	S. Africa	60	0%
16	Malaysia	44	0%	16	Malaysia	44	0%
17	Hungary	39	0%	17	Hungary	39	0%
18	Singapore	36	0%	18	Singapore	36	0%
19	Norway	32	0%	19	Norway	32	0%
20	Czech	30	0%	20	Czech	30	0%
21	New Zealand	21	0%	21	New Zealand	21	0%
22	Slovakia	8	0%	22	Slovakia	8	0%
23	Chile	2	0%	23	Chile	2	0%
24	Hong Kong	0	0%	24	Hong Kong	0	0%
	Asia-Pacific (US$bn)	4,778					
	India as % of Asia-Pacific ex-China	4.6%					
	China (US$bn)	567					
	India % of China	39.1%					
	China as % of Asia-Pacific	10.6%					

Source: Lehman Brothers Fixed-Income Research.

- India will not soon represent a major share of the world bond market. From October 2006 to 31 July 2007, the Indian bond market grew at an annualised pace of 9.48% and now constitutes 0.86% of the global fixed income choice set as measured by the Lehman Multiverse Index. Looking longer-term, the Indian debt market grew at an 18.02% per annum rate from 1999 to 2006 per BIS data. At this pace and incorporating a conservative 8.21% bottom-up growth forecast for the world debt market, India would break 1% of the world bond market as measured by the Lehman Multiverse Index by 1 January 2010 (1.07% exactly) and reach approximately 4.0% by 2025. In dollar terms, the Indian bond market would swell from about US$331bn in 2010 to nearly US$4.0 trillion by 2025, equivalent to the current size of the Japanese government bond market.
- Launched on 1 October 2006, the new Lehman Indian Government Bond Index is not inclusive of all Indian issuers, either in local rupee markets or globally. As such, the BIS data set for international and domestic debt issuance/amount outstanding

offers a more-detailed alternative for comparing this burgeoning market to its peers. We have included a compendium of tables tracing the historical growth rate of Indian debt as reported by the BIS. As shown in Figures 116-117, most of the growth in Indian debt occurred in local markets.

- Local Indian debt outstanding has tripled so far this decade from just over US$102bn in 1999 to US$326bn at the end of 2006. Of that tally, government paper accounts for the vast majority, i.e., US$305bn. Note that in accordance with Lehman Index rules such as minimum issue size (INR10 billion) and time remaining-to-maturity (at least one year), the Lehman Indian Government Bond Index captures only US$218bn or 72%.
- Indian corporate and financial institution debt is nascent but growing rapidly. In 2004, the local Indian debt market had only US$1.4bn in financial institution paper compared with US$15.5bn at year-end 2006. Corporate debt doubled to US$5.3bn outstanding over this same 2-year span.
- Based on its current size, India would represent only a small portion of Asia's local government bond markets (15%) and corporate bond markets (2.5%). In concert with India's rapid economic growth, this looks set to change in the early 21st century.

Figure 116. International Indian debt in a global context: 1987-March 2007

(US$bn)	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	March 2007
All issuers																					
Global	1,055.9	1,171.6	1,335.3	1,644.7	1,853.0	1,921.0	2,107.3	2,529.4	2,846.8	3,258.0	3,629.3	4,411.8	5,468.2	6,490.2	7,594.6	9,270.1	11,705.4	13,940.5	14,610.5	18,448.9	19,567.6
Asia	20.5	21.2	20.7	23.7	28.0	33.5	42.6	59.9	72.0	108.1	140.0	143.6	142.8	140.1	135.3	154.6	177.6	213.6	243.7	291.6	308.3
India	1.8	2.2	2.7	3.3	4.3	4.1	3.0	3.3	3.7	4.4	5.9	5.7	4.8	4.3	3.9	3.4	3.4	6.5	10.7	20.0	26.7
Financial institutions																					
Global	394.1	464.0	537.6	641.3	693.6	690.5	903.9	1,124.0	1,358.2	1,723.9	2,072.0	2,674.0	3,574.1	4,410.1	5,314.1	6,625.7	8,522.2	10,353.6	11,100.2	14,349.5	15,314.5
Asia	7.0	7.5	7.3	8.7	11.1	13.1	18.2	26.7	34.6	55.9	73.9	71.0	67.3	62.9	55.6	66.4	82.9	107.2	128.5	164.3	177.5
India	0.9	1.1	1.3	1.4	1.5	1.4	1.4	1.5	1.6	1.7	2.1	2.1	2.1	2.0	1.7	1.3	1.4	2.4	4.0	7.2	11.9
Corporates																					
Global	-	-	-	-	-	-	518.1	548.0	548.5	552.5	575.3	649.2	781.4	923.9	1,101.0	1,245.1	1,474.6	1,608.5	1,544.5	1,885.6	1,940.0
Asia							14.1	21.8	26.3	38.0	49.4	50.3	49.2	48.8	49.1	52.9	55.9	62.7	68.3	75.8	76.7
India							1.5	1.9	2.0	2.8	3.9	3.6	2.7	2.3	2.2	2.1	2.0	4.1	6.7	12.7	14.8
Govt.																					
Global	-	-	-	-	-	-	-	577.3	639.2	672.7	678.8	717.1	735.3	775.8	796.8	962.4	1,201.7	1,422.8	1,421.4	1,626.2	1,694.9
Asia								11.4	11.1	14.2	16.7	22.3	26.4	28.4	30.6	35.3	38.8	43.7	46.9	51.5	54.1
India											**No debt as reported by BIS**										

Source: BIS

Figure 117. Domestic Indian debt in a global context: 1989-2006

(US$bn)	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
All issuers																		
Global	14,182.0	16,384.0	17,915.0	18,682.0	20,229.9	22,782.5	24,809.4	25,761.7	25,372.3	28,054.5	29,780.7	29,656.6	30,120.5	33,887.7	39,549.1	44,515.0	45,474.4	50,285.5
Asia	275.0	302.6	321.4	387.8	439.2	508.7	596.1	674.4	525.2	782.7	949.0	1,023.1	1,150.0	1,422.9	1,677.0	2,121.3	2,544.9	3,140.6
India	57.4	67.9	45.2	51.3	55.4	63.5	70.6	81.2	75.2	85.7	102.1	113.6	130.2	155.8	203.2	249.5	279.1	325.7
Government																		
Global	7,028.2	8,051.7	8,839.7	9,178.2	10,036.7	11,280.7	12,215.3	12,630.1	12,172.6	13,144.7	13,714.9	13,221.2	13,345.3	15,681.8	19,164.6	22,096.0	22,143.9	24,008.5
Asia	164.8	169.6	162.1	197.3	224.8	248.6	272.8	298.7	243.8	341.7	466.8	526.1	595.3	776.5	982.4	1,304.7	1,587.6	1,942.4
India	56.9	66.6	43.0	47.1	52.2	60.8	65.6	77.9	72.4	83.5	100.0	111.5	128.2	153.7	200.4	245.3	268.0	304.9
Financial institutions																		
Global	5,359.2	6,329.6	6,932.9	7,248.9	7,781.8	8,946.9	9,842.9	10,235.6	10,299.2	11,471.9	12,266.8	12,498.7	12,675.7	13,869.3	15,557.2	17,212.2	18,070.9	20,530.2
Asia	59.5	66.7	78.6	98.5	108.0	131.0	162.2	168.3	130.8	168.1	166.2	176.6	197.0	269.2	317.4	406.1	521.5	712.1
India	0.5	1.4	2.1	3.8	2.1	2.1	4.9	3.2	1.7	1.0	0.3	0.2	0.2	0.2	0.8	1.4	7.3	15.5
Corporate																		
Global	1,794.6	2,002.6	2,142.4	2,254.9	2,411.4	2,554.9	2,751.2	2,896.0	2,900.5	3,437.9	3,799.0	3,936.7	4,099.5	4,336.6	4,827.3	5,206.8	5,259.6	5,746.7
Asia	50.7	66.3	80.7	92.1	106.4	129.1	161.1	207.3	150.6	272.9	315.9	320.5	357.7	377.2	377.2	410.6	435.8	486.2
India	-	0.03	0.04	0.3	1.1	0.6	0.0	0.1	1.2	1.3	1.8	1.8	1.7	1.9	1.9	2.8	3.8	5.3

Source: BIS.

THE FUTURE

Thanks to its impressive modernisation efforts since the early 1990s, India has managed to compress about a half century of US and European debt capital market development into less than two decades. In our opinion, India will make even more rapid progress in modernising its capital market over the next two decades. This process stands to be marked by the following major milestones:

Unrestricted currency convertibility: Given their understandable need for ready liquidity, most international debt funds operate only in those currency regimes which allow the ability easily to buy and sell public securities. The eventual elimination of the current dwindling currency controls, a prerequisite for membership in international debt benchmarks like the Lehman Global Aggregate Index, will galvanise international investor demand for Indian debt securities. Just as Asian central bank purchases of non-local government securities have helped constrain US and European interest rates since 2003, increased international investor appetite for Indian debt securities should help contain long Indian interest rates and benefit India's economic growth engine.

Disintermediation of corporate borrowings from banking system to both local and international debt investors: As the Indian banking system graduates from a loan originator/holder to a more fee-based business model like its European and US large bank counterparts, corporate issuers will turn to the public debt markets to finance their expanding businesses. This will drive up the velocity of corporate origination, most likely to a long-term growth rate above government supply. More important, especially with non-Indian institutional investors increasing their participation in the Indian debt markets, the aggregate supply of credit to the Indian economy will be enhanced, thereby further aiding Indian economic growth.

Broad application of securitisation: Emulating the innovations of the past two decades in more developed capital markets and assuming the implementation of the requisite institutional legal and regulatory framework (eg, an appropriate bankruptcy code), the broad application of securitisation techniques to consumer credit (credit cards, auto loans), real estate loans (both consumer and commercial), and corporate credit (bank loans, receivables, inventory and project financings) is set to spawn a tidal swell of securitised origination. A second-order effect will be the bundling of these various conventional and securitised debt products into Collateralised Debt Obligations (CDOs) to meet the diverse cash flow, yield and total return objectives of both institutional and retail investors located in India and around the world. As in the US and Europe, the outstanding size of the Indian securitised debt market is destined eventually to surpass the combined size of the treasury and corporate bond markets. Overall, this vast liquefaction of both real and balance sheet assets through securitisation will help sustain and even accelerate the pace of Indian economic growth.

Full derivitisation of the Indian debt markets: Moving beyond its impressive inauguration in the government bond market, the full derivitisation of all asset class components of the Indian market from governments through especially corporates (mainly via Credit Default Swaps (CDS)) will facilitate liquidity in the underlying cash markets as well as aiding hedging, risk control and innovation. By authoring a broader, finer and more precise distribution of risks, this supporting derivative architecture should help moderate periods of economic and capital market systemic turbulence. In turn, smoother markets through time should help dampen business, consumer, and investor uncertainties. In parallel, the resulting diminution of strategic risk premia also can help boost the Indian economy.

CONCLUSION

In tandem with its bustling economy, the Indian debt markets are destined to be numbered as among the fastest growing in the world over the first quarter of the 21st century, if not for the entire 21st century. Indian economic maturation, coupled with greater global economic integration, render this burgeoning component of the world fixed income choice set a compelling arena for asset managers looking to add portfolio alpha through international diversification. Indian debt unquestionably will become a regular staple of international debt portfolios. Global asset managers should already be preparing for their inaugural allocation to the dynamic Indian debt market. And far more rewarding than just studying the expansion of the international debt choice set, it is gratifying to watch India rise to its rightful role in the world economy and capital markets.

MEASURING THE LONG-TERM TREND AND VALUE OF THE INR

Craig Chan
+65 6433 6106
craig.chan@lehman.com

Francis Breedon
+44 20 7260 2144
fbreedo2@lehman.com

Jim McCormick
+44 20 7103 1283
jmmccorm@lehman.com

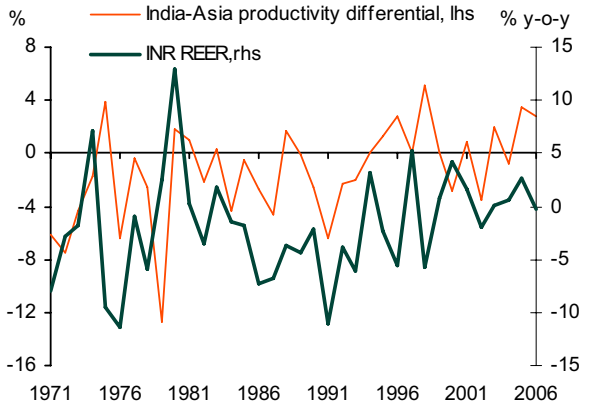
INTRODUCTION

India's moving into a new era of solid economic growth, through rising productivity, economic and financial reforms, and urbanization, should support a long-term appreciation trend of the Indian rupee. To gauge the path and fair value of the rupee, we compare India with other economies that experienced similar investment-and productivity-driven booms during their "take-offs". To measure the fair value of the Indian rupee, we use the Fundamental Equilibrium Exchange Rate (FEER) approach. This technique will determine the INR Real Effective Exchange Rate (REER) level that is consistent with macroeconomic balance. Changing the components of the model allows us to analyse INR valuation in different scenarios.

Productivity booms and their REER impact

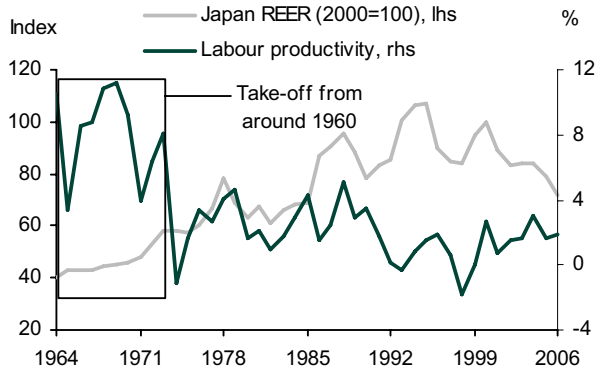
The correlation of productivity with real exchange rates is not "spurious"[95]. Higher productivity leads to REER appreciation as highlighted through: (1) the Balassa-Samuelson effect[96]; and (2) rising cross-country broad productivity differentials. The Balassa-Samuelson framework focuses on real exchange rate appreciation from higher productivity growth in the tradable goods sector relative to non-traded goods in developing economies. The positive sectoral productivity gap led by the tradable sector leads to higher wages and pressures wages in the non-tradable sector higher to keep salaries competitive. Because productivity growth is higher in the tradable sector than the non-tradable sector, unit labour costs and, consequently, CPI inflation will rise faster in the non-tradable sector. This will result in rising inflation for the overall economy, causing the REER to appreciate. For India, our measures show that productivity growth in the tradable sector[97] has risen faster than the non-tradable sector for three consecutive years to 2006. The average tradable and non-tradable sector productivity in 2004 to 2006 was 6.3% and 4.5%, respectively. Wages have risen rapidly in both sectors, but strong productivity in the tradable sector relative to the non-tradable sector may prolong the upward wage pressures in the tradable sector. This could sustain upside inflation risks and filter through to real INR appreciation.

Figure 118. India's strengthening productivity should support INR appreciation



Source: Lehman Brothers, BIS.

Figure 119. Japan productivity surges during take-off



Source: Lehman Brothers, BIS.

[95] *Cointegrating relationships between the real exchange rate, productivity, and real oil price using Johansen (1988) and Stock-Watson (1993) procedures. NBER working paper series no. 8824.*
[96] *Balassa, Bela, "The Purchasing Power Parity Doctrine: A Reappraisal,"* Journal of Political Economy *72 (1964). Samuelson, Paul, "Theoretical Notes on Trade Problems," Review of Economics and Statistics 23 (1964).*
[97] *We have taken agriculture, manufacturing, trade, transport, hotels, communications as tradables. Non-tradables include electricity, construction, other services. We smooth out the volatility with a 5-year moving average.*

Another approach is to look at India's broad cross-country productivity growth differentials and its impact on the INR REER. Critics of the Balassa-Samuelson approach claim that exchange rate appreciation is only partially explained by non-tradable and tradable sector price differentials, and cross-country productivity has more significant implications for the real exchange rate[98]. The reason is that faster productivity can increase aggregate demand, with consumption and investment picking up due to expectations of higher future income and profits[99]. The theory adds that demand for domestic goods due to wealth effects overwhelms the downward pressure exerted by higher productivity upon the terms of trade, and so the real exchange rate appreciates. The broad productivity differential between India and Asia[100] widened to 2.8% in 2006 from -3.6% in 2002 (Figure 118) and the Johansen cointegration[101] test shows no spurious correlation of the two variables. Whether we take the Balassa-Samuelson or the broad cross-country productivity approach, the strength of India's broad productivity led by the tradable sector supports a long-term INR appreciation path.

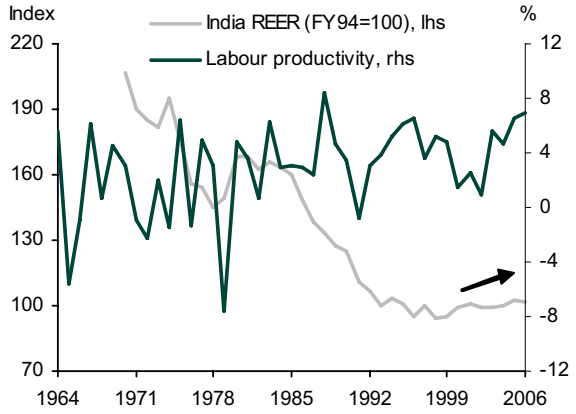
Productivity, REER and take-offs in Asia

Empirical studies show that countries have witnessed strengthening REERs during their productivity booms, which was an inherent reason for their take-offs in the first place.

Japan's economy began to take off at around the start of the 1960s with labour productivity averaging 8.9% y-o-y in that decade (1.2% average in the ten years to 2006). The boom in productivity was led by the surge in domestic investment, with fixed capital investment rising from 19.4% in 1955 to a peak of 36.4% in 1973. From 1960 to 1973, real GDP per capita saw a three-fold rise to US$20,479. During this period in which Japan's economy "took off", the Japanese Yen real effective exchange rate strengthened by 18% from 1964 to 1971 (BIS data only available from 1964), driven largely by nominal FX appreciation (Figure 119). The Japanese Yen REER strengthened by a further 22% from 1971 to 1973. But most of this is likely to have been from the collapse of Bretton Woods in 1971, which led to broad US dollar weakness.

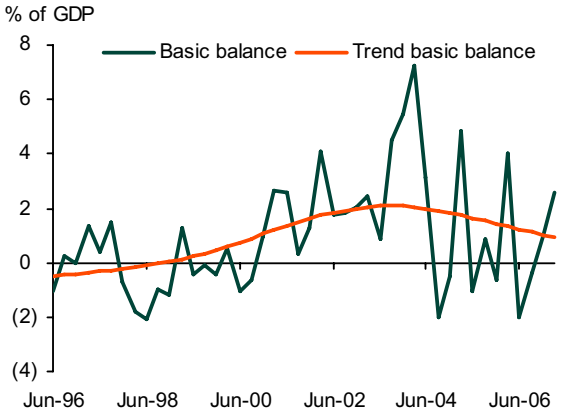
Japan, in our view, bears the closest resemblance to the current boom in India given Japan's capital account liberalisation. But even Japan's capital account convertibility

Figure 120. India's productivity growth strengthening



Source: World Bank.

Figure 121. India's basic balance and trend basic balance using the Hodrick-Prescott Filter



Source: Lehman Brothers, CEIC.

[98] *National Bureau of Economic Research working paper series no. 8824,* Productivity and the euro-dollar exchange rate puzzle, *Ron Alquist and Menzie D.Chin.*
[99] *Bailey, Andrew, Stephen Millard, and Simon Wells, "Capital Flows and Exchange Rates,"* Bank of England Quarterly Bulletin *(Autumn 2001).*
[100] *India's productivity less the average productivity of China, HK, Japan, S.Korea, Singapore and Taiwan.*
[101] *Hypothesis that at least 1 co-integrating vector between the REER and productivity differentials can be rejected using the Johansen (1988) trace test.*

only began to move towards more significant liberalisation from 1960 to the 1970s and was still relatively closed compared with India now.

Other parts of Asia including Taiwan, Singapore and China all saw solid productivity and GDP per capita growth during their boom periods[102], but capital accounts were mostly closed. The TWD strengthened on both a REER and NEER basis during its take-off period, but was volatile. Singapore's REER weakened on relatively low inflation, but appreciated on a nominal basis. Chinese authorities drove the CNY weaker throughout most of its boom period to support exports[103]. But were it not for the heavy FX intervention after China stepped up trade (WTO in late 2001) and capital account liberalisation, China's REER would have likely followed a similar path to Japan's.

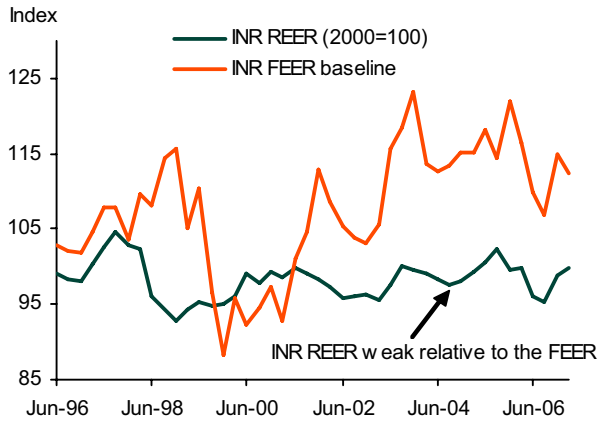
India's productivity boom should lead to real INR appreciation

India's growth acceleration is taking on key characteristics shown by other economies in Asia (especially Japan) during the early stages of their take-offs. Those include the sharp rise in India's investment-to-GDP ratio, the acceleration in GDP per capita, the opening up of the economy (trade-to-GDP) and surging productivity growth (see Chapter 2: India rising).

India's high productivity growth and investment boom looks set to continue. Labour productivity, at 7.0% in 2006, is at the highest since 1988 and is supported by the increase in gross domestic investment as a share of GDP to around 35% in FY07 (28.0% in FY04). Ample sources of funds and healthy balance sheets are underpinning a boom in investment. Other measures of the underlying strength of productivity include our incremental capital output ratio – ratio of the investment rate to GDP growth – which has fallen to under 4.0 in FY07 (more than 4.5 in early 2000). Total factor productivity from FY81 to FY06 also accounted for 2.9% per year of the average 5.9% growth (see Chapter 3: Accounting for India's growth: Figure 26, Sources of economic growth). These support our view that INR still has much to gain from the uptrend in investment and productivity growth with strong demographic and urbanisation trends in its favour.

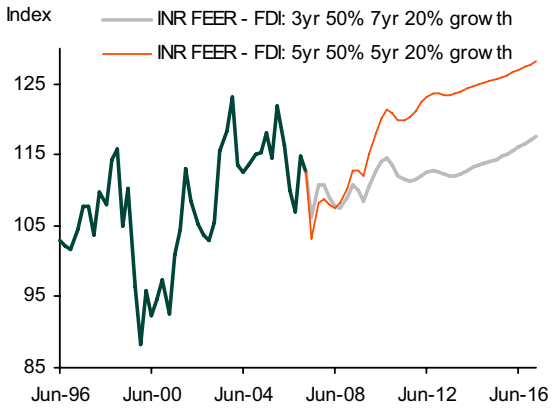
The strength of India's productivity growth and rising differential with Asia (including Japan) and against the US are likely to provide more support to our long-term INR REER appreciation view. The INR REER is still only 7.3% stronger (1H 2007) than the previous ten-year average (Figure 120), suggesting there is ample space for the INR to appreciate further.

Figure 122. INR FEER shows INR undervalued



Source: Lehman Brothers, RBI.

Figure 123. INR FEER under FDI boom scenarios



Source: Lehman Brothers, RBI.

[102] *China 1978, Hong Kong 1961, Taiwan 1961, Japan 1960, Singapore 1965. Lehman Brothers estimates.*
[103] *World Bank 1993,' The East Asian Miracle, economic growth and public policy.'*

Vigilance on capital account liberalisation needed

There are risks to the long-term INR appreciation trend from unpredictable shocks such as US credit market stress, a surge in oil prices, avian flu and politics. But there are also major differences in the global financial market backdrop when comparing India's situation with the periods of take-off in the more developed parts of Asia. Globalisation and the international flow of capital are much larger than a few decades ago. IMF data show that net private capital flows from 22 industrial countries to 33 developing countries accounted for close to 6% of GDP by the end of the 1990s from close to zero in the early 1970s[104]. This could imply greater volatility for the INR as India moves towards a market-determined exchange rate. A cautious approach to freeing up capital movements is likely to be the key, given the scale of global capital flows, because having to back-track on capital account liberalisation or creating FX policy uncertainty would have negative implications. This is evidenced from Thailand's capital account controls in December 2006, which have led to a slowdown in net FDI[105]. Reducing the vulnerability of the INR as its capital account is liberalised will also depend on whether India is able to meet most of its preconditions as recommended by the second Tarapore Committee report (see *Box 8: Recommendations on fuller capital account convertibility*).

Modelling the fair value of the INR through our FEER estimates

With the productivity-driven long-term INR appreciation trend intact in our view, we gauge the fair value of the INR REER through the FEER model[106]. The FEER is a macro balance approach that calculates the level of the INR REER that would align the actual (structural) current account with the equilibrium current account. We judge the gap between the actual and equilibrium current account balance as a trend[107] of the gap between the structural current account and long-term capital flows (FDI, portfolio flows, and reserve accumulation) called the Basic Balance (Figure 121). The structural current account balance is then simply the actual current account adjusted for the state of the economic cycle. Using income and price elasticities[108] for imports and exports of goods and services (G&S) to India's and the world output gap, we can calculate the exchange rate level that closes the gap between the structural and equilibrium current account. According to this calculation, India's exchange rate (INR REER) in 1Q 2007 was undervalued by 12.7% (Figure 122). This undervaluation dropped from a peak of 23.7% in 4Q 2003 as a result of the fall in exports of goods and services relative to GDP.

INR FEER projections based on our assumptions

The flexibility of the FEER approach is that it allows us to implement scenario analysis on INR valuation through changes in the underlying components of the model. Using Lehman Brothers baseline economic assumptions over the next ten years, we take two optimistic, but relatively conservative scenarios on FDI growth to gauge the impact on the INR FEER – conservative, because net FDI accelerated by 116% in the past two years to 1Q07. Our first scenario is FDI rising by an annual 50% y-o-y over the next three years and 20% in the remaining seven years. This assumption widens the undervaluation gap of the current INR REER to 17.4%. In our second scenario, where we assume an annual 50% y-o-y FDI growth over the next five years and 20% in the remaining five years, the INR REER undervaluation widens further to 28.1% (Figure 123). Although this is a static model in that the INR REER is unchanged through the forecast period, this approach supports the case for further INR REER appreciation, especially with India moving into a productivity- and investment-driven boom.

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[104] *IMF, "Effects of Financial Globalization on Developing Countries: Some Empirical Evidence." Eswar Prasad, Kenneth Rogoff, Shang-Jin Wei and M. Ayhan Kose.* March 17, 2003.

[105] *IMF Executive Board Article IV consultation with Thailand, March 23, 2007 noted that capital controls in the long run are costly because they adversely affect investor confidence and capital market development.*

[106] *See* Introducing The Macro-Balance Currency Valuation Model*, December 12, 2006 , Francis Breedon, Lehman Brothers, Global Foreign Exchange. The approach taken is most closely related to Borowski and Couharde (2003).*

[107] *Using a Hodrick-Prescott Filter.*

[108] *Source Lehman Brothers, IMF, IIM (Lucknow): 1.33 and 0.11 for income and price elasticity to imports respectively; 2.47 and 1.498 for income and price elasticity to exports respectively.*

APPENDIX 1: COMMON ABBREVIATIONS

ABM	Anti-Ballistic Missile (Treaty)
ADB	Asian Development Bank
APEC	Asia-Pacific Economic Co-operation
ARF	ASEAN Regional Forum
ASEAN	Association of Southeast Asian Nations
ASSOCHAM	Associated Chambers of Commerce and Industry of India
BIS	Bank for International Settlements
BJP	Bharatiya Janata Party
BOP	Balance of payments
BRICs	Brazil, Russia, India, China
BSE	Bombay Stock Exchange
BSP	Bahujan Samaj Party
CCIL	Clearing Corporation of India Limited
CEO	Chief Executive Officer
CFO	Chief Finance Officer
CFSP	(EU) Common Foreign and Security Policy
CPI	Communist Party of India
CPI(M)	Communist Party of India (Marxist)
Crore	Ten million
CRR	Cash Reserve Requirement ratio
CST	Central Sales Tax
CTBT	Comprehensive (Nuclear) Test Ban Treaty
CV	Commercial vehicle
ECB	External Commercial Borrowings
EM	Emerging market
EU	European Union
FDI	Foreign direct investment
FII	Foreign institutional investor
FRAs	Forward rate agreements
FRBMA	Fiscal Responsibility and Budget Management Act
FTA	Free Trade Agreement
GDP	Gross domestic product
HPAEs	High performing Asian economies
IAEA	International Atomic Energy Authority
IBRD	International Bank of Reconstruction and Development (ie The World Bank)
ICOR	Incremental capital output ratio

IDFC	Infrastructure Development Finance Company
IIFCL	India Infrastructure Finance Company Limited
IIMs	Indian Institutes of Management
IITs	Indian Institutes of Technology
IMF	International Monetary Fund
INC	Indian National Congress (party)
IPR	Intellectual property rights
IRDA	Insurance Regulatory and Development Authority
ITIC	International Trust and Investment Corporation
Lakh	One hundred thousand
LAF	Liquidity Adjustment Facility
MCA	Model Concession Agreement
MD	Missile Defence (formerly National Missile Defence or NMD)
MFN	Most Favoured Nation
MRTPA	Monopolies and Restrictive Trade Practices Act
MSS	Market Stabilisation Scheme
MTCR	Missile Technology Control Regime
Nasscom	National Association of Software and Services Companies
NATO	North Atlantic Treaty Organisation
NCP	Nationalist Congress Party (NCP)
NGO	Non-Government Organisation
NPL	Non-performing loan
NPT	(Nuclear) Non-Proliferation Treaty
NREGS	National Rural Employment Guarantee Scheme
NRI	Non-resident Indian
NSE	National Stock Exchange
NYSE	New York Stock Exchange
OECD	Organisation for Economic Co-operation and Development
OGL	Open general licence
PE	Private equity
PPP	Public-private partnership
PPPAC	Public-Private Partnership Appraisal Committee
R&D	Research and development
RBI	Reserve Bank of India
ROE	Return on equity
SAARC	South Asian Association for Regional Co-operation
SBI	State Bank of India
SEBI	Securities and Exchange Board of India

SEZ	Special Economic Zone
SIMI	Students' Islamic Movement of India
SMEs	Small and medium-sized enterprises
SLR	Statutory liquidity ratio
SOE	State-Owned Enterprise
SSI	Small-scale industry
TFP	Total factor productivity
UN	United Nations
UNDP	United Nations Development Programme
UNGA	UN General Assembly
UNSC	UN Security Council
UP	Uttar Pradesh
UPA	United Progressive Alliance
UV	Utility vehicle
VAT	Value-added tax
WTO	World Trade Organisation
y-o-y	Year-on-year

APPENDIX 2: ISSUES WITH INDIA'S MACROECONOMIC DATA

Data are seldom as good as the economist would like but, in India's case, data problems are severe. For example, as emphasised by Bosworth, Collins, and Virmani (2006), who pay particular attention to the issue of data reliability[109], because more than 40% of India's output is produced in the non-organised sector, the only reliable estimates of output and employment are those made at the times of the quinquennial surveys of households and small enterprises. The annual estimates between these surveys are perforce based on interpolations or extrapolations of these survey data.

Revisions can therefore be substantial: the (upward) revision to 1993-94 GDP, for example, was fully 9%. Moreover, substantial adjustments often have to be made to the base data. For example, as noted by Bosworth, Collins, and Virmani (2006),

> "…the censuses of 1971, 1981, and 1991 are believed to have produced solid estimates of the overall population, but they grossly underestimated the worker-population ratio (WPR) and thus the size of the total workforce. Visaria (2002) discusses these problems and suggests the need for corrections on the order of 26 (1971), 15 (1981) and 12 (1991) percent to the reported figures. In contrast, the quinquennial surveys appear to yield consistent estimates of WPRs, but to underestimate the total population. Thus, estimates of India's labour force are typically generated by combining the survey-based estimates of the WPR for four component groups (rural men, rural women, urban men and urban women) with estimates of the corresponding populations, obtained from interpolating the census data. As a result, reliable estimates of the total workforce are limited to the years covered by the six quinquennial household surveys that were conducted over the period of FY73 to 1999."

Interpolation is one of the principal reasons why production functions can rarely be estimated directly, by econometric methods: to the extent that any relationship between output and inputs is found, it is as likely to be the result of the way that the data were compiled as it is to reflect a genuine underlying relationship running from inputs to output. The interpolation issue is also important in connection with dating the fluctuations in economic activity: the perennial Indian debates about the precise timing of the consequences of economic reform do not have a sufficiently sound basis in the data.

Another serious practical problem concerns the treatment of depreciation in the estimation of the capital stock. To the extent that the rate of depreciation is constant, series for gross capital stock and for net capital stock will grow at the same rate. Hence, while incorrect assumptions about depreciation will thereby introduce errors into calculations that involve the comparisons of levels, such as rates of return on capital, they will not introduce errors into the rate of growth calculations on which growth accounting calculations depend.

However, when the rate of depreciation changes, assumptions about depreciation stand to become important for growth accounting calculations too. Some capital, such as information technology equipment, has a comparatively short life, for technological if not physical reasons; whereas other components of the capital stock, such as buildings and roads, last for decades or more. Hence if, as seems likely, short-lived capital formation is becoming proportionately more important, the assumptions made about depreciation become quantitatively important: to the extent that the depreciation of the capital stock accelerates, the net capital stock will grow more slowly than will the gross. Whether for this or for some other reason, estimates of India's capital stock seem to be uncertain: for example, the change of base to FY00 increased the figure for total industry

[109] *See Bosworth, Collins, and Virmani, A. (2006), especially pp. 9-16, who in turn draw upon Sivasubramonian, S. (2004).*

investment in FY00 by 3%, which in turn had a major effect on estimates of the growth of the capital stock since FY94[110].

In addition to such issues that are likely to be particularly important in India and in other emerging economies, there are other, more general, issues. The twin problems of aggregating the outputs of myriad firms and the self-employed in order to produce a single measure of aggregate output, and of aggregating numbers of workers of many different sorts and abilities in order to produce an index of labour input, are well known. Generally they are noted by economic practitioners and thereafter ignored. But despite their imperfections, these aggregate data are often adequate, at least in the advanced industrial economies, for addressing a number of policy issues, such as inferring the degree of inflation pressure in an economy from the gap between measures of output and potential[111].

[110] *For further detail, see Bosworth, B., Collins, S.M. and Virmani, A. (2006), p. 12.*
[111] *For an interesting and informed discussion of this use for the data in question, see Cotis, Elmeskov, and Mourougane (1993).*

APPENDIX 3: THE RETURNS TO EDUCATION

Education helps to increase the productivity of, and thereby the return to, labour. Most studies corroborate the increasing returns to education, particularly for women, and at the secondary education level. However, estimating the return on education is far from easy. It is usually estimated as the rate of return on "years spent in education". Establishing a relationship between education and earnings is also difficult, because it is necessary to deal with issues such as the effect of omitted variables, measurement error, and family-specific characteristics. Another limitation is that, in most developing countries, such as India, people with higher education constitute only a small proportion of the total labour force.

Notwithstanding these challenges, however, a number of studies have estimated the private return to education using the Mincerian earnings model. The specification of the model is as follows:

$$LnY_i = \beta_0 + \beta_1 S_i + \beta_2 X_{1i} + \beta_3 X_{2i} + \varepsilon_i$$

Where Ln Y_i is the log of earnings of individual *i,*

S_i measures years of completed schooling,

X_{1i} is a vector of observed characteristics of individual *i*,

X_{2i} is a vector of observed characteristics of the family,

and ε_i is the individual-specific error.

In such a specification, the coefficient on schooling, β_1, measures the rate of return to each additional year of schooling (or to a particular level of schooling).

A number of studies have estimated the private and social return to education in India; Kingdom (1998), for example, estimates that the private return to education was 10.6% in India, and detailed analysis of these returns by gender, location, state and cross-country has been estimated by various authors. We briefly review the key results below.

By gender, and rural vs urban

Duraisamy, P. (2002) estimates the private returns per year of schooling in India in 1993-94 by gender and location (Figure 125). He estimates that the return to an additional year of women's education is higher than that of men at the middle, secondary and higher secondary levels. At the secondary education level, the wage gain to women's education is more than twice that of men's.

To estimate the impact of imperfect mobility between the rural and urban areas and the difference in institutional factors, Duraisamy also estimates the return in rural and urban areas separately. He finds that while the returns per year of schooling are higher in the rural than in the urban areas for primary, secondary and technical diploma, the returns for middle, higher secondary and college education are higher in the urban labour markets than those in the rural areas.

Inter-state comparison

Inter-state returns to education have recently been estimated by Asaoka (2006), who finds the highest primary rates of return among lower-income states, while the return on tertiary education is highest among the high-income states (Figure 124). He also finds that the private rates of return to university completion for men in urban areas in 16 states in 1993 were positively and significantly correlated with the state's GDP per capita.

Figure 124. State-wise rate of return to education in India, 1993

	Primary	Secondary	Tertiary
Gujarat	4.3	8.0	23.8
Tamil Nadu	4.4	10.9	22.7
Karnataka	4.8	13.1	21.2
Kerala	2.9	8.9	20.1
Punjab	1.5	6.8	19.5
Andhra Pradesh	4.7	11.5	19.1
Haryana	5.1	9.9	19.1
West Bengal	5.2	9.6	18.5
Maharashtra	5.6	10.8	17.4
Madhya Pradesh	5.4	10.0	15.8
Jammu & Kashmir	4.1	9.4	15.5
Bihar	6.5	7.7	15.0
Orissa	8.1	13.5	12.6
Uttar Pradesh	4.6	9.2	12.1
Rajasthan	3.9	9.8	11.9
Assam	5.9	15.2	4.3

Source: Asaoka (2006) and Lehman Brothers.

Cross- country comparison

A cross-country comparison of the private rate of return to education suggests that India has one of the highest rates of return on secondary and tertiary education (Figure 126). Private rates of return to secondary and tertiary education in India at 17.7% and 16.6% respectively, are much higher than China's at 13.0% and 15.0% respectively. In fact, in most countries the returns have increased over time.

Figure 125. Private rate of return to education in India by gender and location

(%)	All	Men	Women	Rural	Urban
Primary	7.9	6.3	3.8	8.4	6.3
Middle	7.4	6.4	10.3	7	8
Secondary	17.3	16	33.7	19.7	16
Higher secondary	9.3	8.9	11.8	9	10.5
College/University	11.7	12	9.1	11.4	12.3
Technical diploma/Certificate	14.6	15	12	19.1	13.4

Source: Duraisamy, P. (2002) and Lehman Brothers.

Figure 126. Summary of private rate of return to education

Country	Primary	Secondary	Tertiary
Egypt, 1998	5	6	8
Indonesia, 1989	22	16	15
Korea, 1986	-	10	19
Philippines, 1988	18	10	12
Argentina, 1989	10	14	15
China, 1993	18	13	15
India, 1993	7.8	17.7	16.6

Note: For Indonesia, the return is the social rate of return; while for India secondary is the return on secondary school and tertiary is the return on college/university.

Source: Allen, 2001; CRESUR, 2004; Hossain, 1997; Duraiswamy (2002) and Lehman Brothers.

APPENDIX 4: PHYSICAL ECONOMIES OF SCALE

Many, and probably most, economic processes are characterised by increasing returns to scale – a doubling of all inputs more than doubles capacity – and are quantitatively important[112] in contributing to growth, particularly in economies that grow quickly from a small-scale base.

Economies of scale originate in a number of different ways, including from the laws of geometry and of physics; technology; and from the interaction between indivisibilities and the scale of output.

- **Geometrical relations**. In the (engineering) construction of many items of capital equipment, the so-called "power rule" often applies: where the equipment is volumetric, for example a sphere, the relationship between the area (A) of material used to construct it and the volume (V) that it encloses is:

  $A = fV^{2/3}$

  To the extent that cost is (approximately) proportional to the area of material used, it follows that cost varies as volume to the 2/3 power, so that a 10% increase in capacity require only a 6.5% increase in expenditure. A similar phenomenon, albeit with different parameters, applies to many other volumetric shapes, such as tubes and cylinders: hence geometric economies of scale are to be found in a wide range of products, from blast furnaces to engines to ships.

  Economies of scale are even to be found in some areas of agriculture, which is often cited as a classic example of diminishing returns, in such instances as, for example, the application of more and more units of fertiliser to a given area of land. But even in agriculture, some activities exhibit increasing returns to scale. For example, suppose that land needs to be fenced in order to become productive. The cost of the fencing is a *linear* function of the length of the fence: but the area enclosed increases with the *square* of the length of the fence.

- **Physical laws**. The extent to which geometric economies of scale can be reaped may be limited by the laws of physics. A container cannot be scaled up without limit: the laws of physics governing the structural strength of a hollow body imply, for a sphere for example, that if scaled up too far it would collapse under its own weight, unless the walls were thickened. Thus in the case of a sphere, the economies of scale would ultimately be limited to less than implied by the 2/3 "power rule", although in many cases the volume would nevertheless increase less than in proportion with the amount of material used in its construction. Other physical laws can be important too. For example, the maximum speed that a ship can be driven through water is proportional to the *square root* of the length of the hull on the water line, giving rise to the exploitation of economies of scale in shipping. Similarly with blast furnaces: according to the physics of heat, the heat loss from a blast furnace is proportional to its surface area, whereas the *volume* of metal that can be smelted is proportional to the *cube* of its surface area, a source of increasing returns between fuel used and output.

  Moreover, geometric laws and physical laws may interact. In the case of a ship, for example, the geometric property that a ship's carrying capacity is approximately proportional to the cube of the surface area of its hull combines with the laws of physics governing the structural strength of a hollow body such that the cost of building a ship varies approximately linearly with the surface area of its hull.

  By contrast, some structures, such as bridges, exhibit decreasing returns to scale: if all the dimensions of a bridge are altered by a factor ∂, its structural strength is

[112] *This appendix draws particularly on Manne, A.S. (1967), and on Lipsey, R.G. (2000).*

altered by (approximately) $1/\partial$, and its weight, (and thereby the cost of the materials used in its construction) by (approximately) ∂^3.

- **Technology**. The effects of the combination of the laws of geometry and physics taken together can on occasions be offset by technology. For example, the discovery or invention of a new, stronger, material could permit a sphere to be scaled up beyond the size at which it would normally collapse: in that case, the extent of the economy of scale would also be dictated by the (extra) cost of the new material relative to the older one. Similarly, the diseconomies of scale in structures such as bridges could be reduced by using new, higher-strength, materials.

APPENDIX 5: PROBLEMS WITH THE THEORY OF THE PRODUCTION FUNCTION

Perhaps the most severe problem in production function analysis is that of aggregating investment data to produce a series for the capital stock, striking as it does at the heart of the approach. Some economists consider the problem so severe as to render such capital stock series economically meaningless.

To begin with, the function that is used in growth accounting calculations assumes that production takes place under conditions of constant returns to scale, i.e. that a doubling of all inputs results in a doubling of output. This assumption is "required" because, without it, it cannot be assumed that the factors of production, labour and capital, are paid their marginal products, and hence it cannot be assumed that the weights required to be applied to labour and to capital in order to calculate their individual contributions to output can be inferred from the data on the share of GDP going to wages (and thereby to profits) as recorded in the national accounts. If, for example, returns to scale are greater than unity, the last worker to be hired produces more output than the average; workers (and capital) therefore cannot be paid their marginal products, because the sum of wages and profits would exceed the value of the output they (collectively) produce. Conversely, if the production function were to exhibit diminishing returns then, once wages and profits had been paid, some output would be "left over". The problem here lies with the root assumption of constant returns to scale, which is empirically false: almost all physical plant, and many service activities, exhibit powerful increasing returns to scale[113].

A second problem with the production function approach is that the commonly used Cobb-Douglas function assumes that technical progress is equivalent to an increase in the supply and/or efficiency of labour – the assumption of "disembodied", or "Harrod neutral", technical progress. In practice it is most unlikely that all, or even most, technical change takes this form: a considerable amount of technical progress enters the economy only through being embodied in gross investment. Information technology is one obvious case in point: computer technology affects productivity not by being invented, but by being brought into use.

Perhaps the most serious problem, however, is the so-called "aggregation problem". In a seminal article whose very title seems designed to strike unease in the minds of practitioners of growth accounting – *Aggregation in Production Functions: What Applied Economists Should Know* – Felipe and Fisher (2001) represent the problem as being so severe as to be terminal:

> "The pillar of these neoclassical growth models is the aggregate production function, a relationship that is intended to describe the technological relationships at the aggregate level. The problem is that the macro production function is a fictitious entity. At the theoretical level it is built by adding micro production functions. However, there is an extensive body of literature, developed since the 1940s, which points out that aggregating micro production functions into a macro production function is extremely problematic."[114]

These problems have been known for a long time. As Felipe and Fisher point out,

> "As far back as 1963 … in his seminal survey on production and cost, [Professor Sir Alan] Walters had concluded: After surveying the problems of aggregation one may easily doubt whether there is much point in employing such a concept as an aggregate production function. The variety of competitive and technological conditions found in modern economies suggests that one cannot approximate the basic requirements of sensible aggregation except, perhaps, over firms in the same industry or for narrow sections of the economy…"

[113] *Manne, A.S. (1967).*
[114] *Felipe, J. and Fisher, F.M. (2001), p. 1.*

The response

To some extent, this catalogue of criticisms of the growth accounting method, and the production function theory that lies behind it, may appear like what, in ice-hockey parlance, is termed "piling on". Perhaps understandably, practice has been to note the objections, but then press on regardless: just as "you go to war with the Army you have"[115], so has been the practice when studying the sources and caucuses of economic growth.

Why, therefore, have economists persisted with growth accounting analyses, despite the evident problems with the theory that purportedly underpins them? There are perhaps three principal reasons:

1. Instrumentalism: To the extent that aggregate production functions appear to give empirically reasonable results, why should they not be used?
2. Production functions are parables: some rationalisation can be provided for the neoclassical production function parable, but the assumptions are extremely restrictive.
3. For empirical applications (such as growth accounting and econometric estimation), there is no other choice.

Not surprisingly, perhaps, critics such as Felipe and Fisher dismiss all three arguments, the first on the grounds that instrumentalism is "indefensible on methodological grounds"; the second because, in the light of the literature on aggregation, it "loses its power"; and the third on the grounds that it is "a variant of the instrumentalist position and also clashes with the results of the aggregation work"[116].

All of this suggests, with the benefit of hindsight, that it is perhaps pointlessly complicated to conduct a growth accounting exercise on the assumption that a number of implausible assumptions hold true, and then to seek to quantify the importance of dropping each of them. Certainly that is the view of Burmeister (1980), who concludes that:

> "Perhaps for the purpose of answering many macroeconomic questions … we should disregard the concept of a production function at the macroeconomic level. The economist who succeeds in finding a suitable replacement will be a prime candidate for a future Nobel prize."[117]

It is, in our judgement, more sensible in many cases simply to work directly with adducing evidence (sometimes macroeconomic but more often microeconomic, from a range of countries, both developed and emerging), on the potential importance of each of a range of factors that contribute to economic growth, and thereafter to focus on how important, quantitatively, each might be to a given country in a given period.

[115] *The full quotation of this observation by former US Secretary of Defense, Donald H. Rumsfeld, is "As you know, you go to war with the Army you have. They're not the Army you might want or wish to have at a later time." See US Department of Defense transcript December 08 2006 http://www.defenselink.mil/transcripts/2004/tment.r20041208-secdef1761.html*

[116] *For a detailed discussion – and ultimate rejection – of each of these arguments, see Felipe and Fisher (2001), especially pp.26-29.*

[117] *Burmeister (1980) pp. 427-428.*

APPENDIX 6: LIMITATIONS OF THE "GROWTH ACCOUNTING" METHOD

The basic framework within which this issue is typically addressed was pioneered in the 1950s by Professor Solow (1957), in his seminal paper *Technical Change and the Aggregate Production Function*. Solow took as his point of departure the fundamental assumption that an economy can be represented by a function that relates the level of output to the level of the employed labour force, the stock of capital, and the pace of technical progress.

Solow assumed a comparatively simple, constant returns to scale, Cobb-Douglas production function[118] which relates the level of output, Q, to the level of the (employed) labour force, E, and the stock of capital, K, thus:

$$Q = A E^{\alpha} K^{\beta} \qquad (1)$$

The interpretation of the exponents α and β is as follows. A value of less than unity for either implies a decreasing marginal productivity of the associated factor, i.e. a doubling of that factor alone results in a less-than-doubling of output, as is generally to be expected.

If the exponents sum exactly to unity, i.e. $\alpha + \beta = 1$, as assumed by Solow, a doubling of all inputs results in a doubling of output – the production function exhibits constant returns to scale. A value for the sum of the exponents of less than unity implies decreasing returns to the factors of production taken together, i.e. a doubling of both factors results in a less than doubling of output. And if the exponents sum to greater than unity, a doubling of inputs results in output more than doubling – increasing returns to scale.

Then there is the matter of representing technical progress. To the extent that this can be presumed fairly constant, equation (1) can be modified to incorporate it, in a constant returns to scale production function, by a time trend term (e^{ct}):

$$Q = A E^{\alpha} K^{1-\alpha} e^{ct} \qquad (2)$$

In principle, the values of α, β, and c can be estimated by estimating a regression equation using data for (real) GDP, employment, and the capital stock. In practice, however, estimating production functions for entire economies more often than not proves problematic. While output and employment data tend to be measured relatively accurately, with the result that a plausible relationship can often be found between GDP and employment, the capital data often pose considerable problems: a plausible relationship involving the capital variable is often impossible to find. This problem may arise for a variety of reasons. Most data series for capital measure the stock of capital rather than the flow of capital services that the stock provides. And reverse causality is often at work, the capital stock term reflecting the fact that investment tends to be strong when output is growing strongly, rather than the other way around.

Moreover, the very concept of an aggregate, whole-economy, production function is dubious in an economy that is undergoing profound structural change in the way that India has and is. Hence, we were not surprised that it did not prove possible to estimate a meaningful production function for the Indian economy as a whole: most successfully fitted production functions have been achieved using data for sub-sectors of economies, usually the manufacturing sector or some part of it.

Given these difficulties in fitting an aggregate production function, most studies of the determinants of economic growth instead employ the "growth accounting" method, which side-steps the need to find statistical evidence of a relationship between inputs and output.

[118] *For an exposition of Cobb-Douglas production function theory, see Archibald G.C., and Lipsey R.G. (1967).*

The growth accounting method starts from a production function such as (2) above, re-expressed in growth rate terms, thus:

$$q = \alpha e + (1-\alpha)k + c \qquad (3)$$

where lower case letters denote average annual rates of growth.

On the (powerful) assumption that the production function exhibits constant return to scale, i.e. that a doubling of both inputs – labour and capital – results in a doubling of output, *and* that labour and capital are paid their marginal products – two big assumptions – the value of α equals labour's share of national product. This is a convenient, if dubious, pair of assumptions, because it means that the value of α, and hence of $\beta = (1-\alpha)$, can be obtained by calculation from the national accounts, rather than by econometric estimation.

The first such growth accounting calculation was performed by Robert Solow himself, using annual US data for the years 1909 to 1949 for GDP and the two factors of production, employment and the capital stock. Weighting the factors of production by their respective shares in national income, Solow's basic conclusion was that, together, the (growth of) the two factors of production accounted for just 12½% of US GDP growth during the 40-year period: the remainder of US output growth, some 83½%, was attributed to "technical change" – also known variously as "the residual factor", "the residual", or "total factor productivity growth". Such a result is broadly typical of a wide range of studies for other developed economies using the same basic method.[119] And such too is the basic result of such a calculation for India – see Appendix 7 below.

The fundamental difficulty with such an approach, as Solow himself frequently stated, is that concluding that some sort of unspecified *deus ex machina* – the "residual" – was responsible for the bulk of GDP growth is not particularly helpful. By not making any presumption about what was responsible for the greater part of economic growth, it offers few clues about what might be the principal determinants of growth in the future.

Such problems apply equally to growth accounting estimates for India, especially as structural change, which has been, and remains, particularly important in India's development process, is by assumption ruled out of the growth accounting process.

[119] *Another classic work, that applied the growth accounting method to the British economy, is Matthews, R., Feinstein, C., and Odling-Smee, J. (1982). For an exposition of the growth accounting method, see Denison (1991); and for an interesting discussion of some of the principal issues involved, see Jorgensen, D. and Griliches, Z. (1972).*

APPENDIX 7: GROWTH ACCOUNTING RESULTS FOR THE INDIAN ECONOMY

Over the 25-year period from FY81to FY06[120] as a whole, real GDP as measured in India's national accounts grew at an average of 5.9% per year, employment (e) by 2.0% per year, and the capital stock (k) by 5.2% per year. Applying a Solow-type calculation by taking the coefficients on employment and capital shares to be 0.7 and 0.3 respectively – the results are not particularly sensitive to the precise values used – yields the following:

5.9%	=	(0.7 x 2.0%)*e	+ (0.3 x 5.2%)*k	+ c
	=	1.4%	+ 1.6%	+ 2.9%

Thus, employment can be considered to have contributed 1.4 percentage points on average to India's output growth; capital 1.6 percentage points; and total factor productivity growth 2.9 percentage points. Employment growth is thus reckoned to have accounted for 24% of the overall growth of output; the capital stock 27%; and growth of total factor productivity – the so-called growth "residual" – for 49%, very nearly half of total growth.

A broadly similar calculation is reported by Bosworth, Collins, and Virmani (2006)[121], who, on the basis of their adjusted data state that:

> "… over the relatively long periods 1960-80 versus 1980-2004 [reflecting] the widespread view that the performance of the Indian economy changed significantly around 1980…nearly all of the output growth during the [pre-1980] period is associated with increases in factor inputs. However, the post-1980 acceleration is concentrated in improvements in the efficiency of factor use, TFP." [i.e. the 'residual'][122]

Similarly, Dholakia, in his study of the Indian economy for the period 1960-2001, reports that:

> "During the pre-liberalisation period (1960-85), the main sources of growth of Indian economy were the growth of labour input which accounted for 44% and capital input which accounted for 32% of the overall GDP growth rate of 3.66% per annum. Growth of total factor productivity contributed only 0.79 percentage points or less than 22% of the overall growth rate during the pre-1985 period. In the post liberalisation phase (1985 -2000), the total TFP growth in the economy as a whole has turned out to be as high as 2.85 percentage points accounting for 48% of the overall GDP growth rate of 5.95% achieved."

Unfortunately, such results are not by themselves particularly illuminating. It is not helpful to be told that a major part of growth is unexplained. Accordingly, there has developed a considerable so-called "growth accounting" literature – although not to date particularly extensively for India – which seeks to identify at least the larger components of the "residual". The growth accounting method was pioneered by Edward Denison, particularly in his monumental 1979 book *Why Growth Rates Differ*[123], in which he sought to quantify the principal sources of differences between post-war growth rates of the US and a range of European countries. And similar investigations have subsequently been undertaken for many economies, including Japan[124], South Korea[125], and India[126].

These studies generally seek, sometimes with great ingenuity – Denison was the master – to quantify each of a number of influences on aggregate productivity growth suggested

[120] *We have extended the labour force data by a year to 2005-06 by assuming an annual labour force growth of 2.4% as given by Bosworth* et al *(2006) during 1999-2004.*
[121] *Bosworth, Collins, and Virmani (2006), Table 3*
[122] *Bosworth, B., Collins, S.M., and Virmani, A. (2006), p.17.*
[123] *Denison, E. (1967) and Denison, E. F. (1979).*
[124] *Kanamori, H. (1972); and Denison, E.F. and Chung, W. (1976).*
[125] *Kim and Park (1985).*
[126] *Dholakia (1974).*

by economic theory or offered by microeconomic evidence. Such influences include: the (generally improving) quality of factor inputs; improved resource allocation (commonly labour moving from low productivity activities (usually agriculture) to high productivity sectors (usually manufacturing)); and ad hoc modifications to the production function to allow for the possibility of increasing returns to scale.

An example of results from this sort of calculation is given in Figure 127 below.

Figure 127. Perhaps the most severe problem in production function analysis
Sources of Economic Growth, Total Economy, 1960-2005

Annual percentage rate of change				Contribution of:			
Period	Output	Employment	Output per worker	Physical Capital	Land	Education	Total factor Productivity
1960-04	4.7	2.0	2.6	1.2	-0.1	0.3	1.2
1960-80	3.4	2.2	1.3	1.0	-0.2	0.2	0.2
1980-04	5.8	1.9	3.8	1.4	0.0	0.4	2.0
1960-73	3.3	2.0	1.3	1.1	-0.2	0.1	0.2
1973-83	4.2	2.4	1.8	0.9	-0.2	0.3	0.6
1983-93	5.0	2.1	2.9	0.9	-0.1	0.3	1.7
1993-99	7.0	1.2	5.8	2.4	-0.1	0.4	2.8
1999-04	6.0	2.4	3.6	1.2	0.1	0.4	2.0

Source: Bosworth et al *(2006) and Lehman Brothers.*

APPENDIX 8: STATUS OF INDIA'S BILATERAL AND MULTILATERAL TRADE POLICIES

1998

December - India-Sri Lanka Free Trade Agreement (ISLFTA). In operation since March 2000. While India has already completed the tariff elimination programme in March 2003, Sri Lanka is scheduled to reach zero duty by 2008.

2003

March - India-Afghanistan Preferential Trade Agreement. India has granted concessions on 38 products, mainly fresh and dry fruits, in return for concessions on eight items for exports to Afghanistan.

October - Framework Agreement on Comprehensive Economic Cooperation between ASEAN and India. The Trade Negotiating Committee is negotiating free trade in goods.

October - India and Thailand Framework Agreement for establishing Free Trade Area. The Early Harvest Scheme covering 82 items for exchange of concessions between India and Thailand has been in effect since 1 September 2004.

2004

January - Agreement on South Asia Free Trade Area (SAFTA). The tariff liberalisation programme under the Agreement was implemented on 1 July 2006.

January - MERCOSUR Preferential Trade Agreement (PTA). The PTA between India and MERCOSUR (Brazil, Argentina, Uruguay and Paraguay) will be operational after ratification by the legislatures of MERCOSUR countries.

February - Framework Agreement on Bay of Bengal initiative for Multi-sectoral Technical & Economic Coop. (BIMSTEC). Signed by Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand, with the aim of a free trade area on goods with effect from July 2006.

2005

January - India-Chile Framework Agreement on Economic Cooperation. Successful negotiations resulted in a PTA being signed on 8 March 2006.

June - India and Singapore Comprehensive Economic Cooperation Agreement. The Early Harvest Scheme involves phased reduction/elimination of all duty on products other than those on India's negative list by April 2009. Singapore has already eliminated all duty on products from India.

In negotiation

India-Korea Joint Task Force. India and Korea constituted a Joint Task Force for negotiating FTAs in goods, services and investment. Four rounds of negotiations have been held so far.

India-China Joint Force. A Joint。ask Force between India and China has been set up to study in detail the feasibility of, and the benefits that may derive from, the possible China-India Regional Trading Arrangement.

India-Gulf Cooperation Council (GCC) FTA. The first round of negotiations on the India-GCC FTA was held in Riyadh on 21-22 March 2006.

India-Mauritius Preferential Trade Agreement. Currently under negotiation and likely to be finalised shortly.

India-Israel Preferential Trade Agreement. Negotiation process for a Preferential Trade Agreement has commenced.

India-South Africa Customs Union. The framework agreement aims to provide a mechanism to negotiate and conclude a comprehensive FTA.y

Source: Ministry of Finance, Economic Survey 2006-07.

APPENDIX 9: INDIA'S FOREIGN DIRECT INVESTMENT POLICY AS ON 3 OCTOBER 2007

Sector	% Cap	Controls
Retail trading (except single brand product), atomic energy, lottery business, and gambling & betting	0	Sectors prohibited for FDI.
Private sector banking	74	Subject to Reserve Bank of India (RBI) guidelines. The cap is applicable only to private sector banks that are identified by RBI for restructuring.
Non-banking financial companies	100	Various minimum capitalization norms for fund-based NBFCs
Insurance	26	2004/05 budget proposed raising it to 49 percent; however, this is not yet operational.
Telecommunications	74	For basic and cellular, unified access services, national/international long distance, V-sat, and global mobile personal communications by satellite, subject to licensing and security requirements and a lock in period for transfer of equity. Automatic route up to 49%. Beyond 49% needs approval from the Foreign Investment Promotion Board (FIPB)
	74	For ISPs with gateways, radio-paging and end-to-end bandwidth. Automatic route up to 49%. Beyond 49% needs approval from the FIPB.
	100	For ISPs without gateways, e-mail, voice mail, providing dark fiber. Automatic route up to 49%. Beyond 49% needs approval from the FIPB. Subject to divestiture of 26% of their equity in favour of Indian public in 5 years. Subject to licensing and security requirements.
Broadcasting	100	Up-linking a non-news & current affairs TV channel
	49	Setting up hardware facilities such as up-linking, HUB.
	26	Up-linking a news & current affairs TV channel, cable network.
	20	Direct-to-home & FM radio.
Courier services	100	For carrying parcels, packages and other items which do not come within the ambit of the Indian Post Office Act 1898. No FDI allowed in the distribution of letters.
Establishment & operation of satellites	74	Automatic route not available. Approval via FIPB.
	100	Manufacture of telecom equipment. Automatic route available.
Print Media	100	Publishing of scientific and technical magazines, periodicals, and journals.
	26	Publishing of newspapers and periodicals on news and current affairs.
Airports	100	Greenfield projects. For existing projects, FIPB approval required for investments of more than 74%.
Domestic airlines	49	Foreign equity participation up to 49% and investment by expatriate Indians up to 100%. Subject to no direct or indirect equity participation by foreign airlines.
Housing and real estate	100	Residential & commercial premises, resorts, educational institutions, recreational facilities, city and regional level infrastructure.
Petroleum (refining)	26	Cap applies to public sector units. Automatic route not available.
	100	Cap applies to private Indian companies. Automatic route available.
Petroleum (other than refining)	100	Automatic route available. Includes market study and formulation; investment/financing; setting up infrastructure for marketing in petroleum and natural gas sector.
Coal and lignite	100	For most activities in this sector.
Mining	100	Exploration and mining of diamonds and precious stones, gold, silver, and minerals.
Atomic minerals	74	Subject to guidelines issued by the Department of Atomic Energy.
Power	100	Generation (except atomic energy), transmission, distribution and power trading.
Defense and strategic industries	26	Subject to licensing and security requirements.
Coffee & rubber	100	
Alcohol & brewing; cigarettes	100	Subject to license.
Trading	100	Automatic route available for wholesale/cash & carry trading, and trading for exports. FIPB approval for trading of items sourced from small scale sector.
	51	Single brand product retailing.
Floriculture, horticulture, animal husbandry, aquaculture	100	For tea plantations, restrictions apply, including approval from government, divestiture of 26% in five years, and approval in case of change in land use.

Source: Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India.

APPENDIX 10: KEY STATISTICS: INDIA

	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12
Gross Domestic Product									
Nominal, US$bn	604	695	805	912	1187	1478	1761	2066	2415
Nominal GDP per capita, US$	560	635	723	807	1033	1266	1486	1716	1975
Real GDP growth rate, % y-o-y	8.4	7.4	9.0	9.4	8.8	9.2	9.7	10.0	10.0
GDP by industry, % total									
- Agriculture	22.1	20.2	19.7	18.5	17.5	16.7	15.9	15.1	14.4
- Industry	25.7	26.1	26.2	26.6	26.9	27.1	27.4	27.9	28.7
- Services	52.2	53.7	54.1	54.9	55.6	56.2	56.7	57.0	56.9
Gross domestic investment % GDP	28.0	31.5	33.8	35.3	36.5	37.0	38.0	38.5	39.0
Gross domestic savings % GDP	29.7	31.1	32.4	34.2	35.0	34.9	35.6	35.7	36.0
Balance of Payments									
Exports, US$bn	66.3	85.2	105.2	127.1	148.1	174.7	218.4	273.0	341.2
Top 3 export markets, % total:									
US	18.2	17.3	16.8	15.2	-	-	-	-	-
UAE	8.0	9.2	8.3	9.6	-	-	-	-	-
China	4.6	6.4	6.4	6.3	-	-	-	-	-
Imports, US$bn	80.0	118.9	157.0	192.0	236.2	297.6	371.9	464.9	581.2
Merchandise trade balance, US$bn	-13.7	-33.7	-51.8	-64.9	-88.1	-122.8	-153.6	-191.9	-239.9
- % of GDP	-2.3	-4.8	-6.4	-7.1	-7.4	-8.3	-8.7	-9.3	-9.9
Current Account, US$bn	14.1	-2.5	-9.2	-9.6	-16.8	-33.5	-44.3	-58.0	-75.7
- % of GDP	2.3	-0.4	-1.1	-1.1	-1.4	-2.3	-2.5	-2.8	-3.1
FDI inflows, US$bn	4.3	6.0	7.7	19.4	26.1	27.9	34.4	42.9	52.4
FDI outflows, US$bn	-1.9	-2.3	-2.9	-11.0	-13.5	-14.4	-15.3	-18.5	-22.7
External debt, US$bn	111.6	123.2	126.4	155.0	-	-	-	-	-
- % of GDP	17.8	17.3	15.8	16.4	-	-	-	-	-
Foreign exchange reserves, US$bn	113.0	141.5	151.6	199.2	232.1	262.0	295.4	344.3	397.8
Financial Market Indicators									
Exchange rate, per US$	43.4	43.8	44.6	43.6	38.0	35.6	35.0	34.0	33.0
Interest rate, %: 10 year bond yield	5.15	6.69	7.53	7.94	7.75	7.50	7.25	6.50	6.00
Repo rate, %	6.00	6.00	6.50	7.50	7.75	7.75	7.00	6.50	6.00
Cash reserve ratio, %	4.50	5.00	5.00	6.00	7.50	8.50	8.50	8.50	8.50
Stock market, BSE Sensex	5591	6493	11280	13072	-	-	-	-	-
Monetary indicators									
WPI inflation, % y-o-y	5.5	6.5	4.4	5.4	4.4	5.3	4.5	4.0	3.5
M3 money supply growth, % y-o-y	13.1	14.2	16.1	19.6	20.0	19.6	19.0	18.0	18.0
Non-food credit, % y-o-y	17.2	27.7	33.7	31.2	25.3	26.8	25.0	22.0	20.0
Fiscal indicators									
General govt fiscal balance, % GDP	8.5	7.5	7.4	6.1	5.7	6.0	5.4	5.2	5.2
General govt public debt, % GDP	81.5	82.4	78.7	75.3	72.5	71.0	67.4	65.0	63.0

Source: RBI, CEIC, Economic Survey and Lehman Brothers.
Note: All financial market indicators are fiscal year-end numbers.

APPENDIX 11: CHRONOLOGY OF EVENTS IN INDIA

1858 India comes under direct rule of the British crown after failed Indian mutiny.

1885 Indian National Congress founded as forum for emerging nationalist feeling.

1920-22 Nationalist figurehead Mahatma Gandhi launches anti-British civil disobedience campaign.

1942-43 Congress launches "Quit India" movement.

1947 End of British rule and partition of sub-continent into mainly Hindu India and Muslim-majority state of Pakistan. Jawaharlal Nehru becomes first Indian prime minister.

1947-48 Hundreds of thousands die in widespread communal bloodshed after partition.

1948 Mahatma Gandhi assassinated by Hindu extremist.

The government issues the First Industrial Policy Resolution, reserving certain industries for the public sector. The Reserve Bank of India is nationalised and becomes the central bank.

1948 War with Pakistan over disputed territory of Kashmir.

1950 The Republic of India is declared with the promulgation of the constitution. Dr Rajendra Prasad is elected the first president.

1951 A draft of the First Five-Year Plan is published. It is primarily a public expenditure plan.

1951-52 Congress Party wins first general elections under leadership of Jawaharlal Nehru.

1956 The Second Five-Year Plan is presented to parliament and approved. It shifts emphasis to government-led industrialisation.

1957 Stringent import and foreign exchange controls are imposed in response to the growing fiscal and balance-of-payments deficits arising from the implementation of the Second Five-Year Plan.

The Congress party retains power in the third general election.

1961 The Third Five-Year Plan continues the investment patterns of the second plan, focusing on government-led industrialisation.

1962 The Congress Party retains power in the third general election.

India loses brief border war with China.

1964 Prime Minister Jawaharlal Nehru dies. Lal Bahadur Shastri is chosen as the next prime minister.

1965 Second war with Pakistan over Kashmir.

1966 Lal Bahadur Shastri dies in Tashkent. Nehru's daughter, Indira Gandhi, becomes prime minister.

Poor harvests trigger a food shortage and a BOP crisis. India devalues the rupee by 36% and receives food and monetary aid under an IMF-World Bank programme.

1967 Indira Gandhi remains prime minister after the Congress party retains power in the fourth general election.

1969 Parliament passes the Bank Nationalisation Bill nationalising all domestically owned commercial banks. The Fourth Five-Year Plan, placing greater priority on the agricultural sector than earlier plans, is adopted.

1970 The Monopoly and Restrictive Trade Practices Act, regulating the activities of business houses, comes into effect.

1971 Indira Gandhi continues as prime minister after the Congress Party wins the fifth general election.

Third war with Pakistan over creation of Bangladesh, formerly East Pakistan.

1971 Twenty-year treaty of friendship signed with Soviet Union.

1972 The government nationalises all insurance companies.

1973 The Foreign Exchange Regulation Act, controlling foreign investment in India, comes into effect.

1974 India explodes first nuclear device in underground test.

1975 Indira Gandhi declares state of emergency after being found guilty of electoral malpractice.

1975-1977 Nearly 1,000 political opponents imprisoned and programme of compulsory birth control introduced.

1977 The state of emergency is lifted, and parliament dissolved. The Janata Party coalition wins the sixth general election, and Moraji Desai is appointed prime minister. The targets laid out in the Fifth Five-Year Plan are abrogated by the new government, which resorts to an annual planning mechanism.

1979 Moraji Desai resigns. Charan Singh leads a new coalition as prime minister but soon loses support, and parliament is dissolved.

1980 Indira Gandhi returns to power in the seventh general election, heading Congress Party splinter group, Congress (Indira).

Facing a significant BOP problem, India negotiates a loan from the IMF under its Extended Fund Facility. The Sixth Five-Year Plan sets out a target annual growth rate of about 5%, which is achieved over the next five years.

1984 Troops storm the Golden Temple – the Sikhs' holiest shrine – to flush out Sikh militants pressing for self-rule.

Indira Gandhi is assassinated by Sikh bodyguards. Her son, Rajiv Gandhi, is chosen as prime minister after the Congress Party wins the ensuing elections.

1984 In December, a gas leak at the Union Carbide pesticides plant in Bhopal kills thousands. Many more subsequently die or are left disabled.

1985 The Rajiv Gandhi government initiates modest liberalisation measures as regards industrial licensing and import and export regulation. The Seventh Five-Year Plan sets a target annual growth rate of about 5%, which is achieved over the next five years at the cost of increasing fiscal imbalance.

1989 Falling public support leads to Congress defeat in the ninth general election. A coalition of non-Congress parties comes to power, and V.P. Singh is appointed prime minister.

1990 V.P. Singh resigns as prime minister after the BJP withdraws support. Chandra Shekhar leads a minority government supported from the outside by the Congress party.

Muslim separatist groups begin campaign of violence in Kashmir.

1991 The minority government loses support, and new elections are ordered. Rajiv Gandhi is assassinated during the election campaign by a suicide bomber sympathetic to Sri Lanka's Tamil Tigers. The Congress Party wins the tenth general election. The new prime minister, P.V. Narasimha Rao, appoints Manmohan Singh as finance minister.

India faces a severe macroeconomic and BOP crisis, and the government responds with stabilisation measures and structural reforms.

1992 The Eighth-Five-Year Plan, placing greater emphasis on private initiative in industrial development than any previous plan, is adopted.

Hindu extremists demolish mosque in Ayodhya, triggering widespread Hindu-Muslim violence.

1993 Financial sector reforms, based on the recommendations of the Narasimham Committee, are initiated.

1996 Congress suffers the worst ever electoral defeat as Hindu nationalist BJP emerges as the largest single party in the eleventh general election. The National Front coalition forms the government supported by the Congress Party. H.D. Deve Gowda is chosen as prime minister.

1997 H.D. Deve Gowda resigns as prime minister and is replaced by I.K. Gujral. I.K. Gujral resigns, and fresh elections are ordered after the government falls. The Ninth Five-Year Plan, prioritising agricultural and rural development, is adopted.

1998 The BJP secures a plurality in the twelfth general election, and heads a coalition government with A.B. Vajpayee as prime minister.

India carries out nuclear tests, leading to widespread international condemnation.

1999 February Prime Minister Vajpayee makes a historic bus trip to Pakistan to meet Premier Nawaz Sharif and to sign the bilateral Lahore peace declaration.

1999 May Tension in Kashmir leads to a brief war with Pakistan-backed forces in the icy heights around Kargil in Indian-held Kashmir.

The BJP-led coalition government falls, and in the ensuing elections, the National Democratic Alliance – headed by the BJP – wins a majority in parliament. A.B. Vajpayee is chosen as prime minister.

2000 May India marks the birth of its bnth citizen.

2000 Liberalisation measures are initiated in the areas of insurance, consumer good imports, and domestic telephony.

US President Bill Clinton makes a groundbreaking visit to improve ties.

2001 April A high-powered rocket is launched, propelling India into the club of countries able to fire big satellites deep into space.

2001 July Prime Minister Vajpayee meets Pakistani President Pervez Musharraf in the first summit between the two neighbours in more than two years. The meeting ends without a breakthrough or even a joint statement because of differences over Kashmir.

2001 July Mr Vajpayee's BJP party declines his offer to resign over a number of political scandals and the apparent failure of his talks with Pakistani President Musharraf.

2001 September The US lifts the sanctions it imposed against India and Pakistan after they staged nuclear tests in 1998. The move is seen as a reward for their support for the US-led anti-terror campaign.

2001 December Suicide squad attacks parliament in New Delhi, killing several police. The five gunmen die in the assault.

2001 December India imposes sanctions against Pakistan to force it to take action against two Kashmir militant groups blamed for the suicide attack on parliament. Pakistan retaliates with similar sanctions, and bans the groups in January.

2002 January India successfully test-fires a nuclear-capable ballistic missile - the Agni - off its eastern coast.

2002 February Worst inter-religious bloodshed in a decade breaks out after Muslims set fire to a train carrying Hindus returning from pilgrimage to Ayodhya. More than 800, mainly Muslims, die in revenge killings by Hindu mobs.

2002 May Pakistan test-fires three medium-range surface-to-surface Ghauri missiles, which are capable of carrying nuclear warheads.

War of words between Indian and Pakistani leaders intensifies. Actual war seems imminent.

2002 June The UK and the US urge their citizens to leave India and Pakistan, while maintaining diplomatic offensive to avert war.

2002 July Retired scientist and architect of India's missile programme, A.P.J. Abdul Kalam, is elected president.

2003 November India matches Pakistan's declaration of a Kashmir ceasefire.

2003 December India and Pakistan agree to resume direct air links and to allow overflights.

2004 January A groundbreaking meeting is held between the government and moderate Kashmir separatists.

2004 May Surprise victory for the Congress Party in the general elections. Manmohan Singh is sworn in as prime minister.

2004 September India, along with Brazil, Germany and Japan, applies for a permanent seat on the UN Security Council.

2004 November India begins to withdraw some of its troops from Kashmir.

2005 April Bus services, the first in 60 years, operate between Srinagar in Indian-administered Kashmir and Muzaffarabad in Pakistani-administered Kashmir.

2005 July More than 1,000 people are killed in floods and landslides caused by monsoon rains in Mumbai (Bombay) and the Maharashtra region.

2006 February India's largest-ever rural jobs scheme is launched, aimed at lifting around 60m families out of poverty.

2006 March The US and India sign a nuclear deal during a visit by US President George W. Bush. The US gives India access to civilian nuclear technology while India agrees to greater scrutiny of its nuclear programme.

APPENDIX 12: MAP OF INDIA

Source: Lehman Brothers.

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