

India's Growth Potential

India can achieve the target GDP growth of 10 per cent a year by raising its labour and capital productivity. Productivity gains through more efficient processes and more product and service innovations are the key source of growth.

In the last chapter, we presented our assessment of India's labour and capital productivity performance and employment generation potential based on 13 case studies and drew implications for India's growth. In this chapter, we extrapolate our findings and the corresponding implications for these 13 sectors to the overall economy (*see Appendix 5A* for a detailed discussion on the methodology used for extrapolation).

We show that India has the potential to improve both labour and capital productivity (**Exhibit 5.1**) if economic reforms are accelerated. This conclusion is based on the implications that removing the barriers to productivity growth will have for India's growth, as identified in our 13 case studies (*see Appendix 5B*). To summarise:

- ¶ If the current slow pace of reforms continues, India will only be able to maintain GDP growth at around its current 5.5 per cent. The Indian economy will not be able to absorb the expected surge in the workforce, which will lead to an increase in idle hours in agriculture from 36 per cent to 45 per cent of economy-wide employment.
- ¶ If all barriers to productivity improvement are removed, India can achieve around 8 per cent growth in labour productivity, which will translate into a 10 per cent growth in GDP. To translate the productivity gains into a higher aggregate output, India will have to invest in new capacity that will create high productivity jobs.
- ¶ Contrary to the commonly held belief that a total investment rate of 35 per cent of GDP is needed for 10 per cent growth in GDP, we believe that an increase to 30 per cent from the current 24.5 is necessary for India to achieve the 10 per cent GDP growth target. Capital productivity in the sectors can be increased by around 50 per cent through a 20 per cent improvement in capacity utilisation and a 30 per cent improvement in the cost per unit of capacity. This increase will, however, be offset by a reduction of around 15 per cent in overall capital productivity due to a shift in output towards the capital intensive modern sectors. Average capital productivity will thus show a net increase of around 30 per cent.

- ¶ The 30 per cent investment rate is well within India's reach. The additional investment of 5.7 per cent of GDP required to grow at 10 per cent will be funded from two sources. First, removing barriers to productivity and investment will increase FDI from its current 0.5 per cent of GDP to 2.2 per cent. Second, increased domestic savings mainly through a reduction in the consolidated budget deficit will finance the remaining 4 per cent of investment.
- ¶ With complete reforms, India will be able to more than double its current growth rate while creating 75 million jobs outside agriculture and therefore absorbing the new young people entering the workforce over the next 10 years. Our case studies show that India's expected skill profile will be able to support high growth.
- ¶ Quantifying the barriers to growth in India indicates that around half of India's growth potential can be achieved by removing product market barriers. This will contribute as many as 2.3 percentage points to growth. Removing land market barriers and eliminating government ownership will increase growth by 1.3 per cent and 0.7 per cent respectively. Labour reforms and infrastructure investments will contribute 0.2 per cent and 0.1 per cent respectively.

INDIA'S OUTPUT AND EMPLOYMENT PROSPECTS ARE LIMITED IF REFORMS ARE NOT ACCELERATED

If the current slow pace of reforms continues, India's GDP will grow at around 5.5 per cent a year due to slow productivity growth and decreasing employment per capita (**Exhibit 5.2**). Labour productivity will grow at around 4.9 per cent a year (**Exhibit 5.3**), driven by small productivity increases in the modern sectors due to organisational improvements stimulated by deregulation in some sectors. Productivity in agriculture will grow at around 4 per cent a year because of continued mechanisation and yield improvements through better extension services and diffusion of best practices in farming.

Employment will not increase enough to absorb expected growth in workforce

If barriers to productivity growth are not removed, the Indian economy will not be able to absorb the substantial increase (around 2.2 per cent a year) that is likely to take place in the workforce over the next 10 years. The current demographic profile and mechanisation trend in agriculture will inevitably increase underemployment in India (*see* Volume I, Chapter 3: Current Perspectives on India's Economic Performance). Although the population will grow at 1.5 per cent a year, the entry of young people into the workforce will cause it to expand by 2.2

per cent a year. In addition, the existing underemployment in agriculture is likely to increase as current mechanisation trends in agriculture continue.

Without further reforms, this demographic change will increase underemployment in agriculture to 45 per cent of total employment by 2010 (**Exhibit 5.4**). At present, around 36 per cent of the economy's official employment (i.e., 56 per cent of official agricultural employment) consists of idle time. In future, population growth and the increase in the working age population could raise idle hours to 50 per cent of total employment. Continuing mechanisation in agriculture will further displace workers, increasing idle hours to 51 per cent. Although output growth in the transition¹ and modern sectors will create jobs, this will only absorb 5.8 per cent of employment, leaving idle hours in 2010 at around 45 per cent of total employment.

INDIA'S LABOUR PRODUCTIVITY CAN GROW AT 8 PER CENT IF ALL BARRIERS ARE REMOVED

If all productivity barriers are removed, India's labour productivity can rise from the current levels of 4.9 per cent a year to 7.9 per cent. This result is derived from extrapolating our case findings to the overall economy. This high productivity growth will primarily be achieved in the modern sectors, which will take advantage of better organisational practices and economically viable investments (**Exhibit 5.5**). Our case studies provide detailed arguments and estimates on the productivity improvement potential as explained in the previous chapter.

Productivity in the modern sectors could grow at 11 per cent

Labour productivity in the modern sectors can grow at around 11 per cent per year from the current 15 per cent of US levels to 43 per cent in 2010 (**Exhibit 5.6**). As mentioned in the previous chapter, most of the productivity improvements will come from rationalising workforces, improving the organisation of functions and tasks and investing in viable assets. For example:

- ¶ Reforms in the steel industry can increase labour productivity from its current 11 per cent of US levels to 78 per cent in 2010. Privatisation and the lowering of import duties will increase competition among large steel players and force them to rationalise labour and streamline workflow. Similarly, controlling tax evasion and energy theft will force sub-scale and under-utilised mini-mills to exit and allow cheaper productive players to gain market share.

¹ These sectors typically provide goods of lower quality than their modern counterparts (e.g., mud houses as opposed to modern brick houses) to cater to groups that cannot afford the higher quality goods produced by the modern sector.

- ¶ In dairy processing, removing subsidies for cooperative and government-owned plants as well as MMPO (Milk and Milk Products Order) restrictions will increase productivity almost three-fold from 16 per cent to 46 per cent of US levels in 10 years. Increased competitive pressure coupled with removal of subsidies will force cooperatives and public dairy plants to reduce excess workers and improve organisational practices. Moreover, the entry of private players will facilitate the diffusion of best practices, which will reduce seasonal milk fluctuations and increase capacity utilisation in the flush season.
- ¶ In the telecommunications sector, privatisation of operators and a more stable regulatory framework administered by an empowered regulator will allow providers to increase their productivity from the current 25 per cent to the potential 100 per cent of US levels. The entry of new operators and increased choice for consumers will induce managers to rationalise labour and invest in automated repair and maintenance equipment. These practices will lower the operators' labour costs as well as improve the quality of service.
- ¶ Allowing FDI and removing land market barriers will allow retail supermarkets to increase productivity more than four-fold from the current 20 per cent to almost 90 per cent of US levels in 10 years. Removing restrictions on FDI and land ownership as well as levelling taxes across formats will enable the diffusion of retail best practices and enable the restructuring of the retail supply chain. High productivity will allow supermarkets to lower prices below those of counter stores, thereby gaining market share.

Productivity growth in agriculture and transition sectors will be limited

Even if all barriers are removed, productivity in agriculture will grow at only 5 per cent a year while productivity in the transition sectors will remain at current levels. The scope for mechanisation in agriculture will remain limited for the foreseeable future.

- ¶ **Removing barriers in agriculture will allow productivity to grow at 5 per cent mainly because of yield improvements:** In dairy farming, disseminating improved farming practices will ensure an increase in yields. In wheat, the scope for yield improvements and productivity improvement lies mainly in improving extension services and increasing the use of tractors from the current 60 per cent of total land to 90 per cent in 10 years.
- ¶ **Further mechanisation in agriculture (e.g., switching to combine harvesters) will not be economically viable for the next 10 years at least:** Currently, underemployment in agriculture keeps average incomes

in rural areas low. Agricultural wages increase only during the harvesting and sowing seasons when the greater need for labour absorbs virtually all the underemployed workers in rural areas (**Exhibit 5.7**). As the economy grows, underemployed agricultural workers will migrate to transition jobs where average wages are high enough to compensate for their forgone average agricultural income as well as travel costs to urban areas. Initially, these workers will return to their villages to help in harvesting and sowing to earn higher peak season agriculture wages. This return of transition labour eases the pressure on peak season agricultural wages and limits the scope for mechanisation.

In the long run, as demand for transition products and services increases, transition workers will return less often to their villages during peak season. The resulting labour shortage will increase agricultural wages over time and enable mechanisation in the form of combine harvesters and automatic milking parlours. As seen in Thailand, the use of combine harvesters in agriculture occurs only when countries have reached a per capita income four times higher than India's current level. India's per capita income will not reach this threshold level till 2010.

- ¶ **Labour productivity in the transition sectors is limited at around 7 per cent of US levels:** Although currently higher than in agriculture, productivity in the transition sectors is inherently low due to the crude materials (e.g., mud housing), primitive technology (e.g., *chakkis* and tailors), and rudimentary business formats (e.g., street vendors and rural counter stores) used. In most of our case studies, the transition sectors have already achieved their productivity potential in India.

TOTAL INVESTMENT RATE OF 30 PER CENT CAN YIELD 10 PER CENT GDP GROWTH RATE

Achieving India's GDP growth potential will require investments in additional capacity. High productivity growth in the modern sectors will involve rationalising excess labour, improving organisation of the workforce and investing in viable mechanisation. To translate the productivity gains into a higher aggregate output, India will have to invest in new capacity that will create high productivity jobs.

Most people believe that India will require at least 35 per cent investment rate to achieve a 10 per cent GDP growth. However, our findings show otherwise. If all the barriers to productivity growth are to be lifted, India's investment rate will need to increase from its existing 24.5 per cent to only 30.2 per cent to achieve the 10 per cent GDP growth potential. We have found that barriers that hinder capital productivity improvements are the same as those that hinder labour productivity growth. Hence, we do not need to make a separate effort to improve capital productivity. Higher capital productivity will allow India to sustain a given growth

with lower investment levels. As a result, labour productivity will grow at around 7.9 per cent, roughly maintaining current employment split across sectors. Given the expected increase in the workforce of 2.2 per cent a year, this productivity increase will result in a GDP growth of around 10.1 per cent a year.

These requirements are based on the investment estimates for each of our 13 case studies, which incorporated the capital productivity improvement resulting from the removal of productivity barriers. We then took these case level estimates and extrapolated them to reflect a figure for the overall economy, taking into account the output mix evolution that would result from a removal of the barriers. The output mix evolution is the key to estimating overall investment as each sector has different capital requirements per unit of output.

The additional investment of 5.7 per cent of GDP required to grow at 10 per cent will be funded from two sources. First, removing barriers to productivity and investment will increase FDI and allow India to sustain the resulting increase in its current account deficit of 1.7 per cent of GDP. Second, increased domestic savings mainly through a reduction in the consolidated budget deficit will finance the remaining 4 per cent of investment.

India's capital productivity in sectors can increase by 30 per cent

India's capital productivity can increase by around 30 per cent if all productivity barriers are removed (**Exhibit 5.8**). Capital productivity at the sector level will increase by around 50 per cent due to a 20 per cent improvement in capacity utilisation and a 30 per cent improvement in the cost per unit of capacity. At the same time, output will shift towards the modern sectors, reducing overall capital productivity by around 15 per cent. Taking both effects into account, the average capital productivity will show a net gain of around 30 per cent.

At the sector level, capital productivity has two components: The first is capacity utilisation, which is the degree to which equipment and buildings are used during the production or service delivery process. The second is capacity created with assets, which is an indicator of the cost per unit in putting up the equipment and buildings in the first place. Indian companies can improve on both aspects.

¶ **Capacity utilisation:** On average, the capacity utilisation of Indian plants is at least 20 per cent lower than that of plants in the US (**Exhibit 5.9**). Capacity utilisation could be improved in the following ways:

- In the steel industry, players should exit from small mini mills and invest in well-utilised large mills.
- In dairy processing, replacing nondescript cows with crossbred cows and buffaloes will increase the utilisation of processing plants in summer.

- In wheat milling, *chakkis* (primitive flour mills) in rural India can improve their capacity utilisation by 4 per cent every year, the rate of growth in wheat output.
 - Better maintenance of plants and better sourcing of coal will increase utilisation in power generation plants.
 - In retail and retail banking, improved management and economic growth will lead to higher throughput and increase the utilisation of equipment and buildings (such as Point of Sale machines in supermarkets, computers in bank branches).
- ¶ **Capacity created with assets:** Capacity created with assets is typically around 30 per cent lower in India than in the US. This means that Indian plants are typically costlier by 30 per cent than US plants of the same capacity. This is after taking into account the decrease in capital productivity because of the increased substitution of capital for labour as managers invest in viable equipment in response to increasing wages. Several factors are responsible for India's lower capacity created with assets, as described below (**Exhibit 5.10**).
- **Time and cost overruns:** Most Indian steel and power plants have time overruns of 1 to 2 years. Government ownership and lack of competition mean that managers face little pressure to monitor construction costs and completion times. At the prevailing debt to equity ratio of around 1.5 for such projects, this delay translates into an increase in interest cost equal to 10-15 per cent of the total cost of operators.
 - **Over-invoicing of equipment:** At some plants in India, plant equipment is over-invoiced to misappropriate money from projects. In private plants, over-invoicing is possible because of a lack of pressure from the main shareholders and lenders, typically government-owned banks and insurance companies. In government-owned companies, over-invoicing happens because of poor corporate governance. The cost to projects from such overpayments ranges from 5 to 10 per cent.
 - **Over-engineering of plant and machinery:** Instead of following a standardised blueprint, Indian power generation companies typically design each plant individually, leaving ample scope for over-engineering. This practice is also common in fertilisers and petroleum refining where the rate of return is linked to the capital invested.
 - **Low scale and outdated technology:** Sub-scale steel mini-mills, which cost more to build on a per ton basis, are able to compete with large plants by evading taxes and energy payments. While US plants have an average scale of 10.2 million tons per annum (mtpa), Indian

plants have an average scale of 4.1 mtpa. Low scale leads to a difference in capital cost of around 4 per cent. Similarly, petroleum refineries in India are typically smaller in scale than in the US.

In the apparel sector, outdated domestic apparel plants are shielded from competition by entry restrictions on foreign best practice players. Similar penalties arising from outdated technology apply to Indian plants in other sectors as they typically use technology that is at least one generation behind that of the US. The effect of this could increase plant costs by as much as 2-3 per cent.

Shift in output mix towards modern sectors will decrease capital productivity by 15 per cent

An output shift towards the modern sectors, resulting from complete reforms, will significantly decrease India's capital productivity. Modern sectors are typically more capital intensive than are transition and agricultural sectors. Therefore, an increase in the output mix towards the former will decrease India's capital productivity from the current average at the sector level. To illustrate this point, applying Korea's relative capital productivity across sectors to India's expected output mix shows that the output shift can reduce India's capital productivity by around 15 per cent (**Exhibit 5.11**). However, this decrease in overall capital productivity is significantly smaller than the expected 50 per cent improvement at the sector level described earlier.

If all barriers are removed, the output mix will shift towards modern sectors, which will increase total output from today's 47 per cent to 69 per cent by 2010.

Estimating output growth

We have followed two steps in estimating output growth. First, we estimated domestic consumption from international benchmarks. Second, we adjusted the output growth from domestic consumption to reflect India's increased export potential if all productivity barriers were removed.

Estimates for domestic consumption are derived from case level international benchmarks. Since consumers tend to have similar consumption patterns across countries for a given GDP per capita, we have used "penetration curves" to estimate the relationship between GDP per capita and physical consumption in each sector. To arrive at the output growth for the modern sectors, we have deducted the expected demand for transition goods and services in every case. To estimate output of transition sectors, we have used the evolution of transition employment in Thailand from 1970 to 1990 to estimate future output growth in India (**Exhibit 5.12**). Given that the productivity of this sector is not expected to grow in the future, output growth will directly translate into employment growth.

Finally, once we estimated the output evolution at the sector level, we scaled up these results to estimate output growth for the overall modern sectors.²

The domestic output mix is adjusted to account for India's export potential in the future. Indian exports will grow from the current 10.8 per cent of GDP to around 15 per cent, mainly due to growth in the export of manufacturing goods and business services, including software and remote services.

In contrast to the modern sectors, output in the agriculture and transition sectors will lag behind GDP growth.

- ¶ Agricultural output will grow at 4 per cent to meet the expected demand increase. Output growth in agriculture takes place mainly through yield improvements. Our observation in the wheat and dairy farming sectors is that yield will improve as a result of the dissemination of better farming practices and improved irrigation. Increases in exports will be limited and restricted mainly to cash crops such as tea and coffee.
- ¶ Output in the transition sectors will grow at around 6 per cent. Growth in transition output will be driven by higher incomes in the economy. The increased purchasing power of low-income groups will result in a greater demand for transition goods and services. For example, low-income groups that were previously producing their own food and housing will now buy from street vendors and from builders in the relatively inexpensive, unorganised sector. Furthermore, higher income classes will also have a greater need for transition services such as domestic help and other personal services such as laundry and ironing.

Business investment rate will increase to 22 per cent

Total investment can be decomposed into business and non-business (e.g., health and education) investment. Currently, India's total investment rate of 24.5 per cent of GDP is the result of 17.5 per cent of business investment and 7 per cent of non-business investment.

If all barriers to productivity are removed, India's business investment rate will grow from the current 17.5 per cent to 22 per cent of GDP in order to absorb labour reallocated within the modern sectors and to realise India's 10 per cent GDP growth potential. The modern sectors will remain the key drivers of this increased investment (**Exhibit 5.13**).

Our estimates of the investment requirements in the 13 sectors we have studied and scaled up to the overall economy (**Exhibit 5.14**), which take into account the

² For more detail see **Appendix 5B**: Methodology for extrapolation.

capital productivity improvement potential, show that business investment must increase by at least 4.5 per cent.

Our projected increase to 22 per cent in the business investment rate is consistent with the overall trends in capital productivity and output. As we have said, India's overall capital productivity can be increased by around 30 per cent through improved capacity utilisation and capacity created with assets, and taking into account the expected output mix towards modern sectors. In turn, this improvement in capital productivity will translate into a decrease in the business investment per unit of output of around 30 per cent (**Exhibit 5.15**).

Non-business investment will also increase

Although our case-level findings show that transport infrastructure is not a constraint to productivity growth, India has fallen behind on its investment in infrastructure and health and education as well as private housing compared to other benchmark developing countries such as Thailand and Brazil. As a result, we are including in our estimates an increase in non-business investment to bridge this gap.

The increased investment in transport infrastructure, from the current 2.2 per cent of GDP to 4.2 per cent, will be directed mainly towards making targeted improvements to existing transport infrastructure and housing (**Exhibit 5.16**).³

- ¶ Investment in roads will need to increase from 1 per cent of GDP to 2.2 per cent in order to widen and refurbish India's highways and major roads.
- ¶ Investment in ports can continue at the current level of 0.1 per cent of GDP but must be better targeted. Less focus on building new berths and terminals and more attention to removing bottlenecks in existing capacity will create sufficient port capacity for India's future trade demands. In addition, existing capacity can be better used by reducing red tape and bureaucracy in customs, thus contributing to faster ship turnaround.
- ¶ Investment in airports will increase from 0.4 per cent of GDP to 0.5 per cent to fund the required increase in passenger throughput capacity. This includes larger terminals as well as sophisticated air traffic control equipment to increase the take off and landing rate.
- ¶ Investment in urban infrastructure will increase from 0.7 per cent to 1.4 per cent of GDP. Most of this investment should be directed to water, sewerage and roads in city suburbs in order to increase the availability of developed land for construction and retailing.

³ See **Appendix 5E**: Required infrastructure investment.

The government will also increase its investment in education and health from 0.7 per cent to 1 per cent, mainly in the form of equipment and buildings. Although we did not find education to be a constraint to India's current growth potential, faster growth in the future will hinge on adequate investment in the sector. Furthermore, the social value of better education and improved health is now recognised. Better education allows citizens to capture economic opportunities, make better choices and participate productively in a democratic system.⁴

Besides investing in health and education, we also include in our estimates an increase in the current spending on health and education by 1 per cent of GDP, mainly for better salaries for teachers and doctors⁵ (see section on the evolution of the government deficit). For a rapidly growing GDP, this implies increasing the overall spending in health and education more than five-fold.

Finally, reforms in the construction sector will also boost private investment in housing from 1.6 per cent to 3 per cent of GDP. Increased competition in housing construction and removal of land market distortions will drive down housing prices and increase the square metres of construction per capita in India to reach international benchmarks (*see* Volume III, Chapter 1: Housing Construction for details on the evolution of this sector).

India will invest more efficiently than most fast growing Asian countries

If all productivity barriers are removed, India will invest more efficiently than most fast growing Asian countries (**Exhibit 5.17**). First, it will need to invest more than other Asian countries (except China) did when they were at India's stage of development. Second, India will need to ensure more efficient allocation and use of capital to attain close to best practice capital productivity. In fact, the investment to GDP growth ratio should be higher than that observed in all other Asian countries.

REQUIRED INVESTMENT RATE IS WITHIN REACH

If all barriers to productivity growth are removed, the required 30 per cent investment rate and hence the 10 per cent GDP growth potential will be within India's reach. The additional investment of 5.7 per cent of GDP required to grow at 10 per cent will be funded from two sources. First, the increased inflow of FDI will allow India to sustain the resulting increase in the current account deficit of

⁴ For a discussion on India's past performance in health and education and their impact on the country's social development *see* *India: Economic Development and Social Opportunity* by Amartya Sen and Jean Dreze, Oxford University Press, 1995.

⁵ These estimates are based on international benchmarks for teachers and doctors per capita in India vis-à-vis other developing countries.

1.7 per cent of GDP. Second, increased domestic savings resulting mainly from a reduction in the consolidated budget deficit will finance the remaining 4 per cent of investment (**Exhibit 5.18**).

Increased FDI will finance 1.7 per cent of GDP of additional investment

If India removes all barriers to productivity improvement and growth, FDI will certainly increase. This increase will fund additional investment to the tune of 1.7 per cent of GDP, though absorbing this FDI without putting pressure on the exchange rate will require an increase in the current account deficit. This is sustainable because of the higher imports stemming from higher investment in upgrading existing capital stock and installing new capacity.

The current account deficit will grow from the current 1.1 per cent of GDP to nearly 2.8 per cent over the next 10 years (*see Appendix 5C*). Although exports and invisibles (e.g., tourism) will increase, imports will grow faster. Exports will grow by 5 per cent of GDP, from the current 10.8 per cent to 15.8 per cent mainly through software exports, remote services and exports in selected manufacturing sectors such as apparel and textiles. Imports will grow by 7.4 per cent of GDP primarily due to greater imports of capital goods for upgrading existing equipment and installing new capacity. Finally, the increase in the inflow of invisibles will also increase by 0.7 per cent from 1.7 per cent to approximately 2.4 per cent of GDP owing mainly to increased earnings from tourism.

With complete reforms, India could increase its FDI inflow from 0.5 per cent of GDP in 2000 to at least 2.2 per cent by 2010. This will bring India closer to the FDI levels of other developing countries (**Exhibit 5.19**). In fact, the potential is as high as 4-5 per cent of GDP but from a current account deficit perspective we can absorb 2.2 per cent. This FDI can be attracted in any of the three sectors: domestic sector, export-oriented sector or through privatisation. Further, the barrier that prevents productivity and output growth also prevent FDI inflows.

The main reforms needed are the removal of product market barriers and arbitrary enforcement, removing restrictions on foreign ownership and the elimination of government ownership. This will encourage the entry of best practice players. For example, allowing FDI in retail and enforcing taxes uniformly on all players will encourage best practice retail players to enter the Indian market just as they have done in China and Poland. In turn, these large retail players will attract foreign food processing companies, thereby bringing in additional FDI.

Increased domestic savings will finance remaining 4 per cent

Removing productivity barriers will also increase domestic savings enough to finance the remaining 4 per cent of GDP for investment. Currently, India's gross domestic savings of 24.5 per cent of GDP are below the levels achieved in other developing countries. Following the removal of productivity barriers, we expect

India's domestic savings to increase to around 27.4 per cent of GDP, a level achieved by other Asian countries at similar GDP per capita levels (**Exhibit 5.20**).

Domestic savings will rise in three ways:

- ¶ First, removing barriers to productivity growth will shrink the consolidated budget deficit, a key factor in the current low levels of domestic savings by at least 4.9 per cent (*see Appendix 5D*). Such measures as rationalised taxation, better tax enforcement, less power theft and higher user charges will directly improve the balance of both central and state governments. Expenditure can be reduced by around 2.3 per cent of GDP by privatising government-owned companies and reducing losses in the power sector as well as using the proceeds of privatisation to alleviate interest charges on public debt. Similarly, government receipts can be increased by around 2.6 per cent of GDP by levelling excise duties and increasing property tax collection and user charges.
- ¶ Second, reforms will make investment more attractive, encouraging companies to reinvest profits and expand their productive businesses.
- ¶ Third, higher incomes and improved returns on savings will give individuals more incentive to increase personal savings.

RESULTING EMPLOYMENT GROWTH WILL ABSORB EXPECTED SURGE IN WORKFORCE

With complete reforms, India will be able to more than double its current growth rate while creating 75 million jobs outside agriculture and, thereby, absorbing the young people entering the workforce over the next 10 years. Our case studies show that India's expected skill profile will suffice to support high growth.

Additional new jobs will absorb increase in the workforce

Besides raising GDP growth from 5.5 to 10 per cent a year, removing barriers to productivity growth will also enable the Indian economy to absorb the substantial increase in the workforce that will take place over the next 10 years (**Exhibit 5.21**). We believe that complete reforms will create 75 million new jobs outside agriculture and prevent underemployment in agriculture from growing.

Our employment estimates are derived from our productivity and output estimates at the case study level, including our benchmark of employment growth from the experience of Thailand. As mentioned in the previous sections, productivity growth estimates are derived from our quantification of the productivity gap as well as our assessment of how fast this gap can be closed. Output growth at the sector levels is obtained by summing domestic consumption growth derived from

the “penetration curves” and the output growth that would come from exports. These productivity and output growths at the case level are then scaled up for the overall economy to obtain average productivity growth, GDP evolution by sector and, hence, employment evolution by sector.

The estimated output and employment evolution by sector is consistent with the experience of Thailand in 1992, when it was at the same stage of development that India will be at 10 years from now (**Exhibits 5.22 & 5.23**).

As we have said, the current demographic profile and growing productivity in agriculture are likely to exacerbate underemployment in agriculture unless sufficient jobs are created by the transition and modern sectors. Although the population will grow by 1.5 per cent a year, the entry of young people into the workforce will cause an overall annual increase of 2.2 per cent in the workforce. Moreover, productivity growth in agriculture will release around 8 million jobs, reducing the share of (full time equivalent) employment in agriculture from the current 28 per cent to 21 per cent in 2010. As a result, an additional 75 million jobs will be required to maintain underemployment at current levels and keep the share of idle hours to 36 per cent of total employment (i.e., 56 per cent of official employment in agriculture).

This employment challenge can be met only if India unleashes growth in the modern and transition sectors through productivity-enhancing actions (**Exhibit 5.24**). In the modern sectors, this will create around 32 million jobs while the transition sectors will create an additional 43 million jobs. As a result, these sectors will be able to absorb the expanding workforce as well as the workers displaced from productivity improvements in the modern sectors.

India has sufficient aggregate labour skills to achieve 10 per cent GDP growth

The current evolution of skills in India will be sufficient to support the 10 per cent GDP growth required for the next 10 years. Although additional skills are required to sustain higher GDP growth, our findings show that most of these skills can be acquired on the job. As a result, we did not find low literacy rates (*see* Volume I, Chapter 4: Synthesis of Sector Findings) to be a constraint on productivity growth in the sectors we studied. Moreover, most of the new jobs will be created in sectors such as construction and retail, which require relatively lower skills than sectors like banking and software.

Accounting for the retirement of existing workers, India will require an additional 2 million skilled and 51 million semi-skilled workers over the next 10 years (**Exhibit 5.25**). To sustain a 10 per cent GDP growth rate, the modern sectors will need to employ 36 million skilled and 90 million semi-skilled workers in 2010. These estimates are based on our extensive interviews and findings in the case studies and scaled up to the overall modern sector (**Exhibit 5.26**). Sectors such as

construction and retail can achieve best practice productivity levels even with relatively less literate workers. Moreover, high school graduates could fill blue-collar jobs in manufacturing plants.

Graduates will be required only in top-level managerial positions in manufacturing and in high value added services such as banking and software. Interestingly, given the current workforce profile, most of these jobs will be filled by existing young workers who will still be active in 2010.

India's educational system will be able to close the expected skill gap. Even at current supply trends, India's educational system will provide an additional 30 million skilled and 105 million semi-skilled workers, which is well above the estimated requirements (**Exhibit 5.27**). This "excess" of skills is also a feature of India's current performance, with current employment already skewed towards higher skills than required. As we found in our case studies, skilled graduates are often found performing low skill jobs.

We found a similar result when we tested the availability of specialised engineering skills for manufacturing and software services. Despite the increased sourcing of software professionals by companies in developed markets, the recent growth in the number of graduates from Indian engineering schools is likely to be sufficient to meet the needs of a high growth economy over the next 10 years (**Exhibit 5.28**).

RELATIVE IMPORTANCE OF DIFFERENCE BARRIERS TO OUTPUT GROWTH

Around half of India's additional growth potential will come from the removal of product market barriers. More specifically, of the additional 5 percentage points of GDP growth, the removal of product market barriers will account for as many as 2.3 points. Land market barriers and government ownership are also significant, constraining India's growth by 1.3 per cent and 0.7 per cent respectively. We found that labour market and infrastructure barriers are relatively less significant, restricting India's growth by only 0.2 per cent and 0.1 per cent respectively (**Exhibit 5.29**). This estimate is based on the external barriers to labour and capital productivity analysed in each case study, accounting for the fact that barriers may affect productivity and output differently.

Appendix 5A: Assessing the barriers to productivity and output growth

In this appendix we explain how we quantified the barriers to productivity growth, using the following three-step process:

- ¶ First, we quantified the external barriers to labour productivity in each case study.
- ¶ Second, in each case, we accounted for the fact that barriers may affect productivity and output differently. We also accounted for the fact that capital productivity barriers may differ from labour productivity barriers.
- ¶ Third, we extrapolated the figures in the case studies to the economy to arrive at the overall quantification of barriers to output growth.

QUANTITATIVE IMPACT OF PRODUCTIVITY BARRIERS

As we have said, we found that product market barriers are the major constraint to labour productivity in most sectors, accounting for 70-90 per cent of the constraint on labour productivity growth. Land market barriers also act as impediments to the growth of the retail and housing construction sectors. In the case of largely government-owned sectors such as power, retail banking, steel and telecommunications, we found that government ownership inhibited labour productivity by limiting the competitive intensity in the industry. This accounted for 70-80 per cent of the constraint on labour productivity. Labour market barriers were found to limit labour productivity only in automotive plants and are relatively less important in most other cases, accounting for less than 10 per cent of the constraint on labour productivity growth (**Exhibit 5.30**).

DIFFERENTIAL IMPACT OF BARRIERS TO PRODUCTIVITY AND OUTPUT GROWTH

Barriers to output may not always have the same relative importance as barriers to labour productivity. For example, in retail banking, one of the biggest barriers to labour productivity growth is the government's ownership of large banks. While these banks employ the majority of the employees in the industry, they are unable to invest in technology and introduce new channels. However, the new private banks are able to do all this and have been growing significantly in market share.

It is, therefore, conceivable that most of the output growth in the future will come from private banks. The most important barrier to output growth in the industry is not government ownership but product market barriers such as interest rate controls and an unsatisfactory judicial system.

In each case study, we have analysed whether barriers to output growth are the same as barriers to labour productivity growth and whether they have the same relative importance in preventing both output growth and labour productivity growth.

As **Exhibit 5.31** shows, in almost all cases, the relative importance of product market barriers increases while that of government ownership and labour market barriers decreases. This is consistent with the fact that greenfield investment or capacity additions contribute most of the output growth in most industries. Both are most hindered by product and land market barriers. For example, in dairy processing, current productivity growth is checked by government ownership of cooperative plants. If product market restrictions such as MMPO licensing were to be removed, we would find that most of the growth in milk processing would come from private entrants.

As we moved from pure labour productivity barriers to output barriers, we also quantified the barriers to capital productivity growth in cases with significant capital investment. We found that, in the power, telecom and steel industries, the barriers to capital productivity were very similar to the barriers to output growth. As before, this corresponds to the fact that a lot of the capital invested in these sectors is likely to be new capacity, the creation of which suffers from the same barriers that affect output growth.

EXTRAPOLATING OUTPUT ONLY BARRIERS

Having quantified the barriers to output growth, we scaled them up to arrive at the weighted average impact of each barrier. This was done by weighting the barriers in each case by the average increase from the “status quo” output expected between 2000 and 2010. Areas such as the automotive sector, where the increase in output between a “status quo” scenario and a “complete reforms” scenario is small, were given a lower weight than sectors such as retail or housing construction, which are likely to witness huge increases in output.

At the aggregate level, barriers that prevent the growth in output of modern sectors are weighted higher than those that affect agriculture or transition because their contribution to overall output growth is much lower. On scaling up, we found that product and land market barriers are four to five times more likely than government ownership to constrain output growth. Labour market barriers and poor infrastructure do not have a significant effect.

Appendix 5B: Methodology for extrapolation

Our estimates of overall productivity, output and employment are based on the productivity and output estimates for the case studies extrapolated to calculate that for the overall economy. This extrapolation was done in two stages:

- ¶ First, we reclassified Indian non-agricultural output and employment in transition and modern sectors. To do this, we made a detailed examination of employment figures from the 49th National Sample Survey round at the 3-digit level of the SIC code. We classified each sub-sector based on information from our case studies as well as expert interviews. For example, we included mud-house construction in the transition construction sector and tailoring and *chakkis* (primitive flour milling) in the transition manufacturing sector. According to this analysis, around 60 million employees (around 15 per cent of total employment) are working in transition sectors in India while 86 million employees (around 21 per cent of total employment) are working in modern sectors (**Exhibits 5.32 & 5.33**).
- ¶ Second, we scaled up productivity and output for each segment.
 - We scaled up productivity and productivity growth by averaging, for each sub-sector, the productivity levels and growth estimates of the following representative sectors:
 - In the transition sectors, tailoring and *chakkis* for manufacturing and street vendors for trade; mud-house construction for transition construction; and tailoring and street vendors for personal services (such as domestic help).
 - In modern sectors, steel for mining and quarrying; steel, automotive assembly, food processing and apparel for manufacturing; telecom for transport, storage and communications; power for utilities; housing construction for construction; retail for trade; banking and software for financial and business services; and public sector banks for government services.
 - We also scaled up output growth by averaging the output growth estimates of the representative sectors. As mentioned earlier, we used “penetration curves” as benchmarks for estimating output growth in the modern sectors. In the case of transition sectors, we used

employment growth in transition sectors in Thailand as a benchmark for output growth potential in India.

Appendix 5C: Balance of Payments if barriers are removed

If productivity barriers are removed, the current account deficit will grow from the current 1.1 per cent to nearly 2.8 per cent of GDP over the next 10 years (**Exhibit 5.34**), due to an increase in exports, imports and invisible transfers. Exports will grow from the current 10.8 per cent to 15.8 per cent of GDP. Imports will also grow from 13.6 to 21 per cent of GDP, driven primarily by an increase in the import of capital goods and consumption goods. Finally, inflow of invisibles transfers (mainly increased earnings from tourism) will increase from 1.7 per cent to approximately 2.4 per cent of GDP.

EXPORTS

Although Indian exports have reached 10.9 per cent of GDP by growing at an average rate of 10 per cent a year since 1990, they are unlikely to exceed 16 per cent of GDP by 2010 even if all barriers to productivity growth are removed (**Exhibit 5.35**). This is lower than the export levels of benchmark countries such as China and Thailand (**Exhibit 5.36**). This slow growth is primarily due to the fact that western countries have already outsourced most of their manufacturing to lower wage countries and, therefore, are unlikely to further outsource manufacturing to India. Service exports will grow rapidly but are unlikely to exceed 5 per cent of GDP by 2010.

- ¶ **Agricultural exports:** Agricultural exports could grow from their current level of US\$ 5.4 billion to US\$ 10.1 billion by 2010, an average annual growth of 6.2 per cent. This is close to the past trend of 6 per cent a year, driven mainly by an increase in tea and coffee exports.

Exports of tea and coffee could grow at 7.6 per cent a year. While India already has a significant share of world trade in these products, its share could rise further due to India's growing superiority in quality tea and coffee. Inadequate marketing is the main factor limiting this growth.

Exports of other agricultural products will continue to grow at their current rate of 6 per cent a year. The low growth of the world market means that, to increase exports, India needs to steal market share from competing nations. Given its lack of competitive advantage over other producing nations, this will be difficult to achieve.

¶ **Export of manufactured goods:** Export of Indian manufactured goods could rise from the current level of US\$ 37.8 billion to US\$ 108.2 billion by 2010, an average annual growth of 11.1 per cent compared to the 8 per cent of the past. This modest growth will be driven mainly by an increase in the export of apparel and allied products (textiles, shoes and leather), toys and electronics. However, India will not witness the export boom experienced by other South East Asian countries through the outsourcing of manufacturing by the West. India's earlier restrictions on FDI and other product and labour market distortions have deterred Western businesses from entering. Since a lot of the outsourcing has already happened, even if India were to remove all barriers to FDI and to productivity and output growth, few Western firms would switch their manufacturing to India. Moreover, the continuing underemployment in China's rural areas would continue to keep its wages low.

Sectors with higher export potential such as apparel and allied products and electronics will increase from US\$ 10.8 billion in 2000 to US\$ 38.5 billion by 2010, an average annual growth of 13.5 per cent. A rapid growth in world trade of these products and India's geographical advantages will drive this growth. In particular, India can take advantage of its geographical proximity to European markets and increase the market share from other low wage countries exporting to these regions. To achieve this, India needs to remove important product market barriers still affecting these sectors such as small-scale reservations, import barriers and restrictions on FDI (*see* Volume II, Chapter 3: Apparel).

Exports of other manufactured products will increase from US\$ 26.9 billion in 2000 to US\$ 69.8 billion in 2010, continuing their past average annual growth of 10 per cent.

¶ **Services exports:** Export of services from India can rise from the current level of US\$ 2.2 billion to US\$ 52 billion by 2010, an average annual growth of 37.2 per cent (**Exhibit 5.37**). Software exports and remote services will contribute to this boom, as will some percentage of pharmaceutical and health services exports.

Software exports and remote services are expected to grow from US\$ 2.2 billion to US\$ 47 billion between 2000 and 2010. India has a huge competitive advantage in software services primarily due to its large, well educated, English-speaking population. A language advantage is key in software and remote services, where customer interaction and coding language are mainly in English (*see* Volume III, Chapter 5: Software for more details on estimates of export growth potential).

In pharmaceuticals, just as US firms are outsourcing their software service requirements to India, Western pharmaceutical firms are expected

to outsource their back-end research and development functions to India. Early forecasts indicate that this business will be worth US\$ 5 billion by 2010.

IMPORTS

Imports are expected to grow at nearly 20 per cent a year over the next 10 years from 13.6 per cent to 21 per cent of GDP (**Exhibit 5.38**).

- ¶ Import of capital goods is expected to rise from 1.7 per cent to nearly 5.5 per cent of GDP. With complete reforms, the capital-intensive modern sectors of telecom and power will drive a substantial share of total import growth. We expect that 50 per cent of the incremental machinery and equipment required will be imported. This is consistent with our findings in Brazil and Poland.
- ¶ Import of petroleum products will increase from 2.8 per cent to 3.5 per cent of GDP over the next 10 years. In the past, consumption of petroleum products has grown in line with GDP growth. Domestic production, which amounts to nearly one third of demand, has remained constant over the last decade. Consequently, petroleum product imports have grown at a slightly higher rate than GDP. In future, with increased private participation in the oil sector, we expect domestic production to grow at around 5 per cent per annum, lower than the projected growth in consumption of 10 per cent a year. Therefore, we expect imports to grow at 12-14 per cent a year and remain the dominant source of supply.
- ¶ Imports of consumer goods will grow from 1.7 per cent to 4.1 per cent of GDP by 2010. With the opening up of the Indian economy, imports have grown at 30 per cent a year in absolute terms, although from a very small base. As consumption increases in line with increased GDP per capita, we expect these imports to continue to grow at around 30 per cent a year.
- ¶ Export-related imports are expected to experience growth rates similar to corresponding exports (such as gems and precious stones, apparel and chemicals) and, hence, are likely to grow from 2.7 per cent to 3.2 per cent of GDP.
- ¶ Other imports, mainly durable goods, have grown at nearly the same rate as GDP and are expected to continue to experience growth rates in line with GDP growth.

INVISIBLE TRANSFERS

Net inflow from invisibles will increase from 1.7 per cent to 2.4 per cent of GDP over the next 10 years, due to an increase in tourism receipts as well as continuing growth in private transfers from Non-Resident Indians (NRIs).

Over the next 10 years, the sharp potential increase in the number of tourists of around 17 per cent a year will increase tourism revenues by over 10 times their current value of US\$ 1.2 billion. Due to its wealth of culture and largely English-speaking population, India has a strong competitive advantage in tourism. The removal of land and product market barriers will boost investment in retail, hotels and restaurants geared to tourists. Similarly, boosting business activity will also increase business investment into the country. As a result, we can expect a significant growth in the number of tourists, reaching at least half of China's current level by 2010. Most tourism revenues will be generated in the retail, hotel and restaurant industries. This increased output from tourism exports has already been captured in the output growth estimates of the retail industry. Since the potential growth of these industries has been calculated by benchmarking against countries that also have significant numbers of tourists, the estimated future output already captures future tourism revenues.

Private transfers from NRIs have grown at nearly 12-13 per cent a year over the last 10 years. Since the earnings determining these NRI inflows are linked more to the growth of the world economy than the Indian economy, we expect these inflows to continue to grow at the same rate. At the same time, there might be some increase with more Indians moving out to work for international companies and repatriating earnings back to India. Hence, we believe that these inflows will grow at around 13 per cent a year.

CAPITAL INFLOWS

With complete reforms, India's capital inflows will increase from the current 2.5 per cent to 4.7 per cent of GDP due to an increase in FDI from the current 0.5 per cent to 2.2 per cent of GDP.

Appendix 5D: India's consolidated deficit if all barriers are removed

Removing productivity barriers will reduce the consolidated budget deficit by nearly 4.9 per cent (from the current 11.6 per cent) of GDP, contributing to an increase in domestic savings.⁶ This reduction will result from a potential cutback in government expenditure of around 2.3 per cent of GDP and an increase in revenue receipts of nearly 2.6 per cent (**Exhibit 5.39**).

REDUCTION IN GOVERNMENT EXPENDITURE

With the right measures, the government could succeed in reducing its expenditure by nearly 4.6 per cent of GDP. Having achieved these savings, the government could support faster growth by increasing its expenditure on health, education and infrastructure by approximately 2.3 per cent of GDP. The main actions the government needs to take are as follows:

- ¶ **Privatising Public Sector Units (PSUs):** This will help reduce the government's budgetary support to these PSUs by nearly 0.5 per cent. This reduction is brought by eliminating all support from centre and state governments towards capital expenditure, maintenance and part funding of losses. The centre and state governments together provide around 1.0 per cent of GDP as budgetary support to these PSUs. The government would, however, lose the dividend and other receivables from these PSUs, which are around 0.5 per cent of GDP.
- ¶ **Reforming the power sector:** This will help the government save nearly 1 per cent of GDP. Reforming the power sector will help the government reduce losses by nearly 1 per cent of GDP. These losses are mainly due to heavy subsidies to agricultural and domestic consumers, power theft and poor state of SEB receivables. As a result, the power sector is experiencing a loss of around Rs 25,000 crore or nearly 1.5 per cent of GDP.
- ¶ **Reducing interest payments:** Interest payments, the largest single expenditure item in the government budget, can be reduced by 3.2 per

⁶ All figures in this section are average percentages of GDP for the next 10 years. In the case of the budget deficit, increased revenues from reforms (e.g., privatisation) would mostly accrue during the initial years.

cent of GDP. This reduction can be achieved almost equally by adopting a two-pronged approach:

- By repaying outstanding debt with the proceeds from privatisation
- Reducing the cost of debt through lower interest rates.

A 60-80 per cent privatisation of all non-strategic PSUs, including the State Electricity Boards, is likely to provide the government with about US\$100 billion with which to repay debt. This will help reduce the interest expenditure by around 2.2 per cent. Further, floating administered interest rates (e.g., in small saving schemes such as provident funds and post office deposits), which form a large part of the debt burden, will reduce interest expenditure by around 1 per cent of GDP.

- ¶ As we have said, the government will need to increase spending on health, education and infrastructure by nearly 2.3 per cent of GDP. Total spending on health and education (for better equipment and buildings) needs to be increased by nearly 0.3 per cent of GDP. As we have pointed out, we also estimate an increase in infrastructure spending by nearly 2 per cent of GDP (*see Appendix 5E* for a detailed discussion on infrastructure investment requirements).

INCREASED RECEIPTS

The government can increase its revenue receipts by nearly 2.6 per cent of GDP by levelling taxes and duties as well as implementing economic user charges and property taxes.

- ¶ As much as 46 per cent of the total manufacturing sector output is from the small-scale sector, which is exempt from paying excise duties. Complete reforms will allow the government to levy excise duties uniformly, increasing receipts by nearly 1.5 per cent of GDP.
- ¶ Increasing user charges for water and sewerage and rationalising the property tax and stamp duty structure will increase receipts by 1 per cent of GDP. Raising average yearly user charges for water and sewerage to Rs.1,100 per household from an average of Rs.100 today, combined with better enforcement, can help improve receipts from user charges by nearly 0.5 per cent of GDP. Rationalising property tax and stamp duty structure can increase government collections by nearly 0.5 per cent of GDP. This increase can be achieved by: (a) freeing property tax from rent control and linking it to the market value of the property; (b) bringing the property tax rate closer to international levels to around 1 per cent from nearly 0.5 per cent; and (c) by rationalising stamp duties to

2-4 per cent levels from the current levels of 8-12 per cent and encouraging larger number of property transactions to be registered.

Appendix 5E: Required transport infrastructure investment

Although our case-level findings show that transport infrastructure is not a constraint to productivity growth, India has fallen behind on its investment in infrastructure and health and education as well as private housing compared to other benchmark developing countries such as Thailand and Brazil. As a result, we are including in our estimates an increase in government investment in transport infrastructure from 2.2 per cent of GDP to 4.2 per cent of GDP.

KEY ISSUES IN TRANSPORT INFRASTRUCTURE

While the length of India's road and rail network will not be a bottleneck to economic growth, the quality and width of some of the key roads, the amount of railway freight rolling stock and the capacity of Indian ports and airports are key issues to be addressed in the face of very high GDP growth.

- ¶ **Poor quality of Indian roads:** The length of Indian roads compares very favourably with benchmark countries. India has 280 kilometres of paved road per thousand square kilometres of land area. This is more than Indonesia (90), China (28), the Philippines (130) and Thailand (130) (**Exhibit 5.40**). India has 950 kilometres of paved road per million people. This is more than Indonesia (810), China (220) and the Philippines (550) and marginally less than Thailand (1080). India has 13.3 kilometres of highways and expressways per thousand square kilometres of land area. This is more than both Indonesia (7.0) and China (2.6).

However, the quality of Indian roads is a problem, and will become increasingly so in the future. Key highway segments, in particular along the “golden quadrangle”, are very overburdened and need to be widened. In addition many roads are in need of resurfacing.

- ¶ **Inadequate port capacity:** Capacity in Indian ports is currently massively overstretched. However, it can be increased almost five-fold with limited investment in machinery and automation and better organisation of functions and tasks (**Exhibit 5.41**). This increase will eliminate the need to build new ports for the next 10 years.

- ¶ **Overstretched airports:** India's main airports are also very overstretched. With an expected 10.3 per cent annual growth in passenger traffic, India will need to increase the capacity of its existing international airports as well as upgrade some of its larger domestic ones.
- ¶ **Poor quality railways:** India's rail track length compares very favourably with its benchmark countries. India has 12.4 kilometres of track per thousand square kilometres of land area. This is more than Indonesia (3.4), China (5.9) and Thailand (7.2) and marginally less than the Philippines (13.0). India has 42 kilometres of track per million people. This is greater than Indonesia (31) and the Philippines (5) and marginally less than China (45) and Thailand (62).

However, as India's GDP grows, it will face a shortage of freight wagons. India currently has only 4.3 freight wagons per kilometre of track compared to 7.4 in China and an average of 4.8 in countries with a GDP between 12 per cent and 25 per cent of the US.

In addition, poor quality rolling stock and railway track constrain passenger and freight throughput and will need to be improved in the future. The existing rolling stock, both passenger and freight, is outdated. Further, the railway track is of different gauges in different regions and is mostly not electrified.

INVESTMENTS REQUIRED TO IMPROVE TRANSPORT INFRASTRUCTURE

To facilitate economic growth, in our estimates we include and increase in government investment in transport infrastructure from the current 2.2 per cent of GDP to 4.2 per cent in 10 years. These estimates include a 30 per cent capital productivity improvement potential in these sectors.⁷ This will complement private investment in infrastructure as a result of the removal of the productivity and output barriers, including privatisation in power and telecom.

- ¶ **Government investment in infrastructure:** The government will invest in roads, ports, airports and urban infrastructure.
 - **Roads:** Investment in roads will increase from 1 per cent of GDP to 2.2 per cent (on average US\$ 15.3 billion per annum) to fund highway widening and road resurfacing. The proposed widening of the golden quadrangle will cost US\$ 5 billion. Widening other highways will cost

⁷ Since the government will make some of these investments, our estimate of the potential for capital productivity improvement in infrastructure projects is lower than our full reforms estimate of 50 per cent.

US\$ 22 billion and resurfacing roads will cost US\$ 128 billion over the next 10 years.

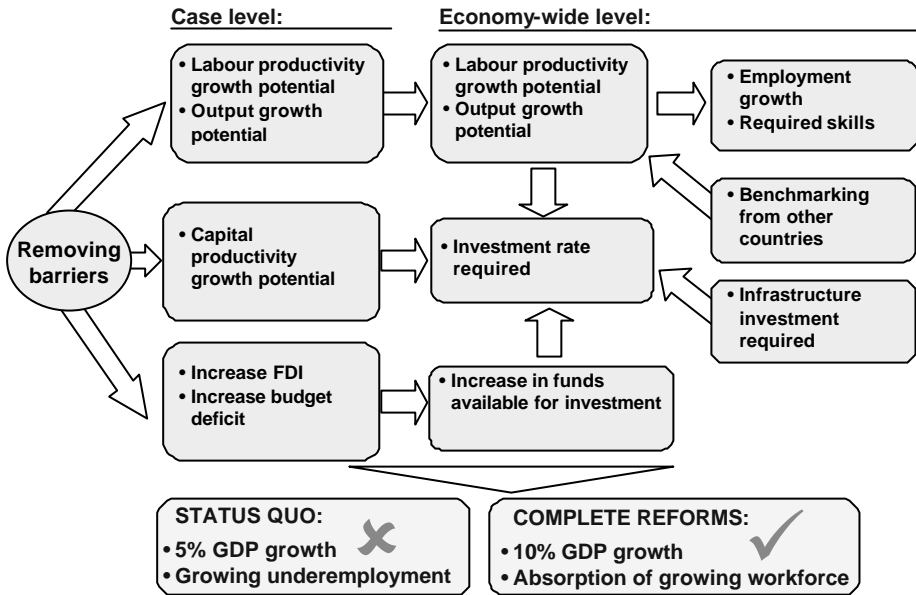
- **Ports:** Investment in ports need not increase but should be better targeted. Better targeting of investment, with less focus on building new berths and terminals and more focus on the right equipment to remove bottlenecks to existing capacity, will create sufficient port capacity to cope with India's future trade demands. We estimate that 0.1 per cent of GDP (on average US\$ 0.9 billion per annum) is needed to fund the automation and equipment required at the existing major ports.
 - **Airports:** Investment in airports will increase from 0.4 per cent of GDP to 0.5 per cent (on average US\$ 3.2 billion per annum) to fund the required increase in passenger throughput capacity. This includes both larger terminals (US\$ 32.3 billion) and advanced air traffic control equipment to increase the maximum take off and landing rate from one plane every 5 minutes to one plane every minute (US\$ 1.1 billion).
 - **Urban infrastructure:** Investment in urban infrastructure will increase from 0.7 per cent to 1.4 per cent of GDP. Most of this investment should be made in water, sewerage and roads in city suburbs in order to increase the availability of developed land for construction and retailing.
- ¶ **Business investment in infrastructure:** Business investment will also increase, following privatisation and other actions.

Investment in the railways will increase from 0.7 per cent of GDP to 0.9 per cent (on average US\$ 6.2 billion per annum) to fund the necessary track and rolling stock improvements. This comprises track widening where necessary, track electrification and additional modern rolling stock

Similarly, investments in power and telecommunications will also increase, fuelled by privatisation and increased competition (*see* Volume III, Chapters 2 and 6, for details).

Exhibit 5.1

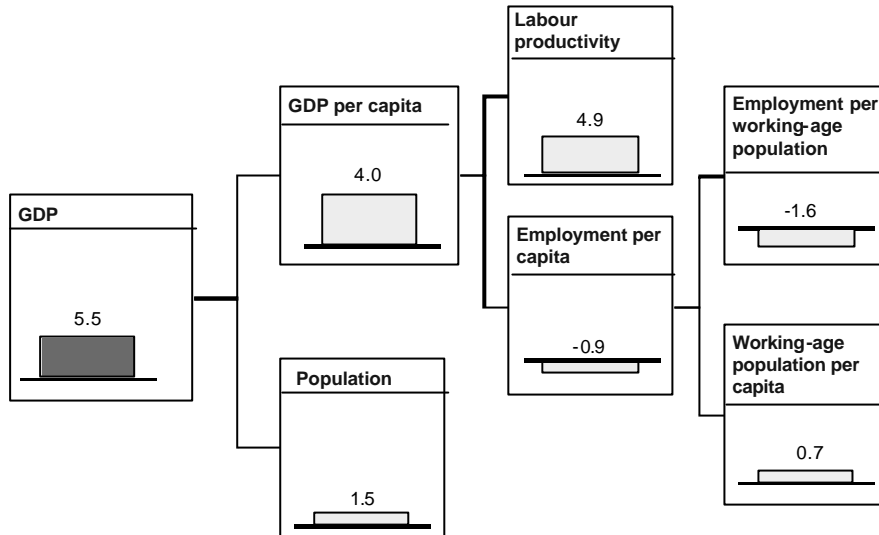
ESTIMATING INDIA'S GROWTH POTENTIAL



Source: McKinsey analysis

Exhibit 5.2

STATUS QUO: ESTIMATES OF OUTPUT GROWTH, 2000-2010
CAGR



Source: McKinsey analysis

Exhibit 5.3

PRODUCTIVITY GROWTH ESTIMATES UNDER 'STATUS QUO'

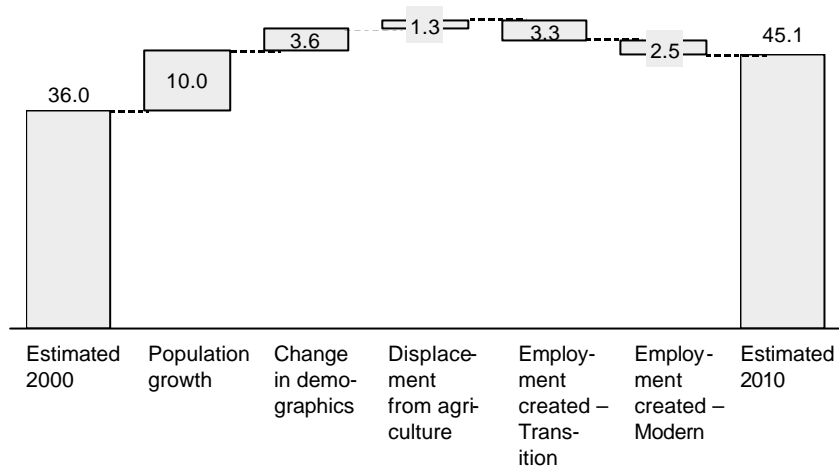
Sector	Past productivity growth Per cent	Expected productivity growth, 2000-2010 Per cent
Dairy farming	5	5
Wheat farming	5	5
Steel	16	5
Automotive assembly	20	10
Dairy processing	7	7
Wheat milling	3	4
Apparel	4	3
Telecom	19	16
Power: Generation	5	5
T&D	5	5
Housing construction	3	2
Retail	5	4
Retail banking	2	6
Software	7	7

Source: Interviews; McKinsey analysis

Exhibit 5.4

SHARE OF IDLE HOURS UNDER 'STATUS QUO'

Per cent

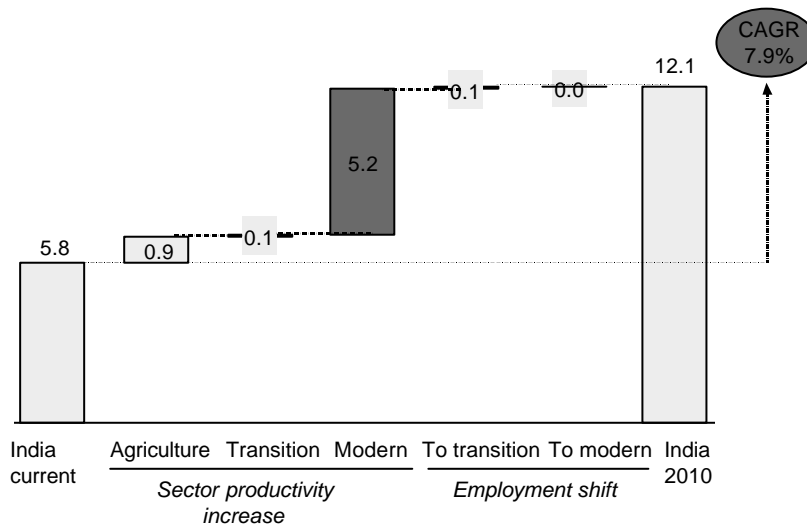


Source: NSS; India Manpower Profile, 2000; McKinsey analysis

Exhibit 5.5

SOURCES OF LABOUR PRODUCTIVITY GROWTH

Per cent, US = 100

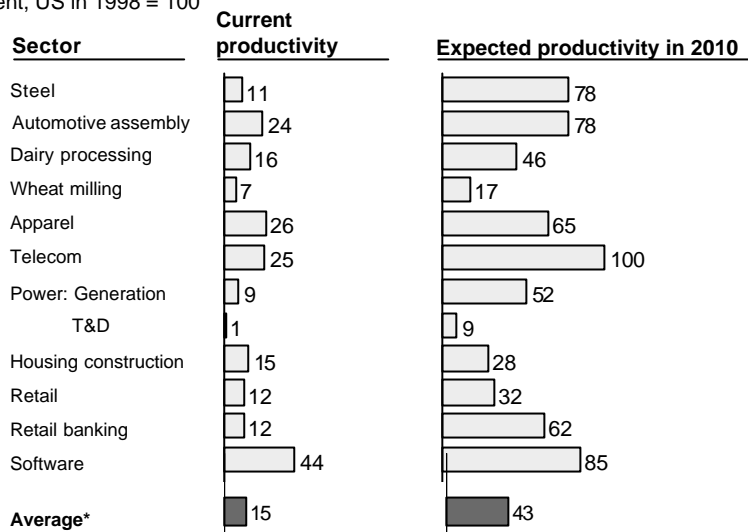


Source: Cases; McKinsey analysis; Manpower Profile of India

Exhibit 5.6

LABOUR PRODUCTIVITY IN MODERN SECTORS UNDER 'COMPLETE REFORMS'

Per cent, US in 1998 = 100



* Grossed up to the overall economy

Source: Interviews, McKinsey analysis

Exhibit 5.7

RELATIONSHIP BETWEEN PEAK SEASON AGRICULTURAL WAGES AND TRANSITION WAGES

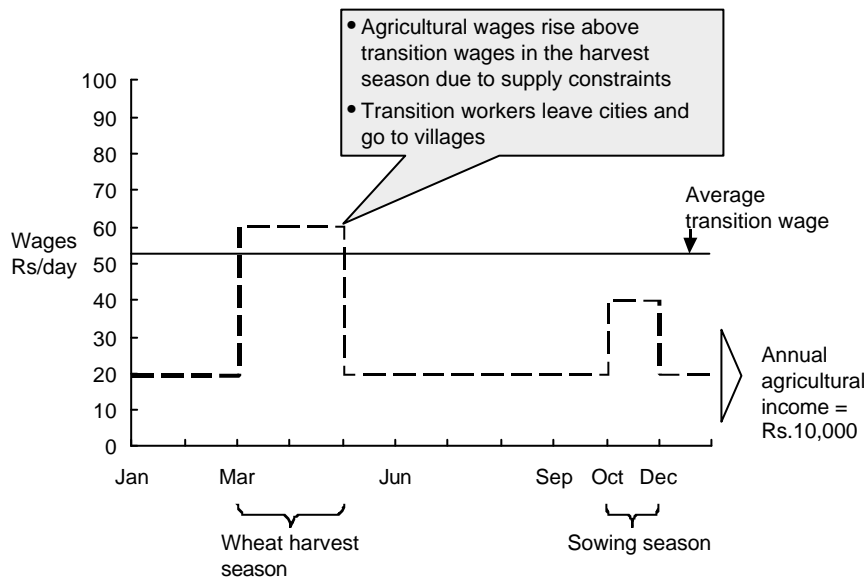
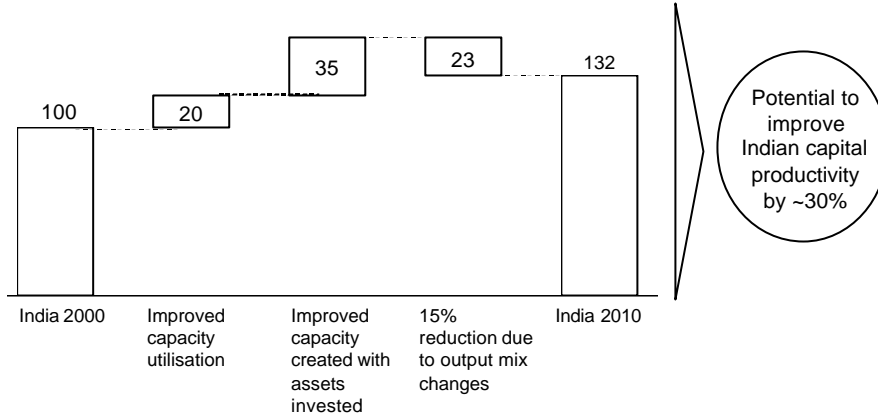


Exhibit 5.8

EXPECTED CHANGES IN CAPITAL PRODUCTIVITY

Index, India average in 2000 = 100



Source: Interviews; McKinsey analysis

Exhibit 5.9

CAPACITY UTILISATION OBSERVED IN CASES STUDIED

Case	India		India potential in 2010	Potential improvement
	Per cent of US	Per cent of US		
Power: Generation	83	100	100	20
T&D	30	30 *	30 *	0
Steel	64	100	100	56
Telecom	81	100	100	21
Dairy farming	30	80	80	170
Wheat farming	25	34	34	36
Dairy processing	69	77	77	12
Wheat milling	26	40	40	54
Retail (supermarkets)	30	60	60	100
Housing construction	71	80	80	13
Apparel (Modern)	70	100	100	43
Automotive	59	80	80	36
Retail banking	54	83	83	54
Software	95	100	100	5
Average	56	76	76	>20

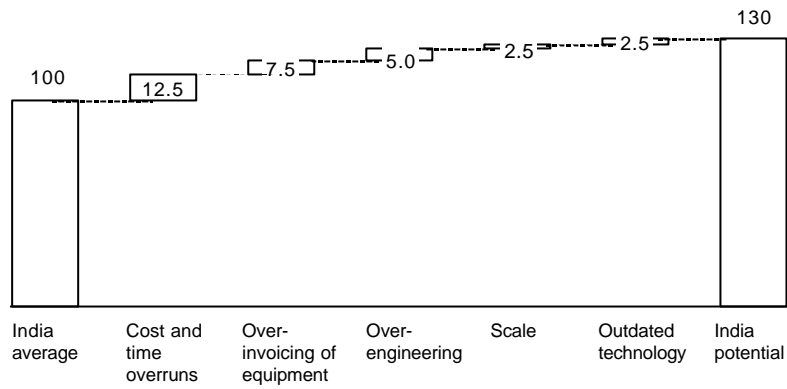
* Based on monetary realisation of stolen energy

Source: Interviews; McKinsey analysis

Exhibit 5.10

CAPACITY CREATED BY ASSETS INVESTED

Index, India average in 2000=100

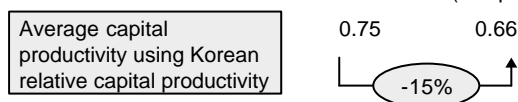
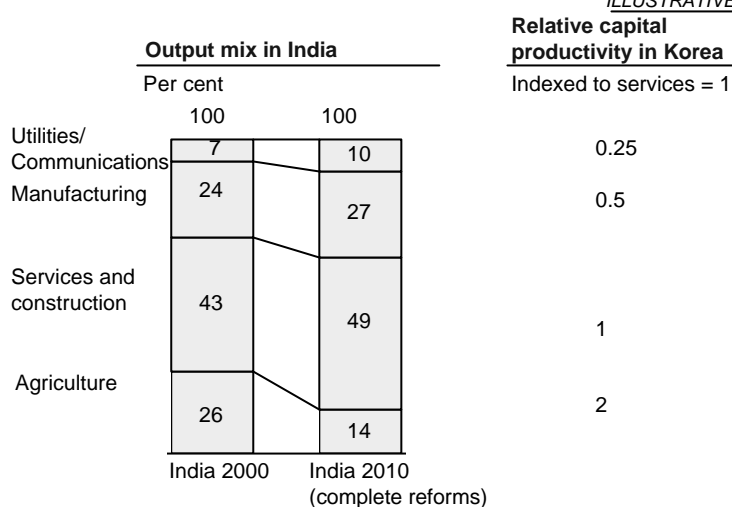


Source: Case interviews; McKinsey analysis

Exhibit 5.11

IMPACT OF OUTPUT MIX EVOLUTION ON CAPITAL PRODUCTIVITY

ILLUSTRATIVE

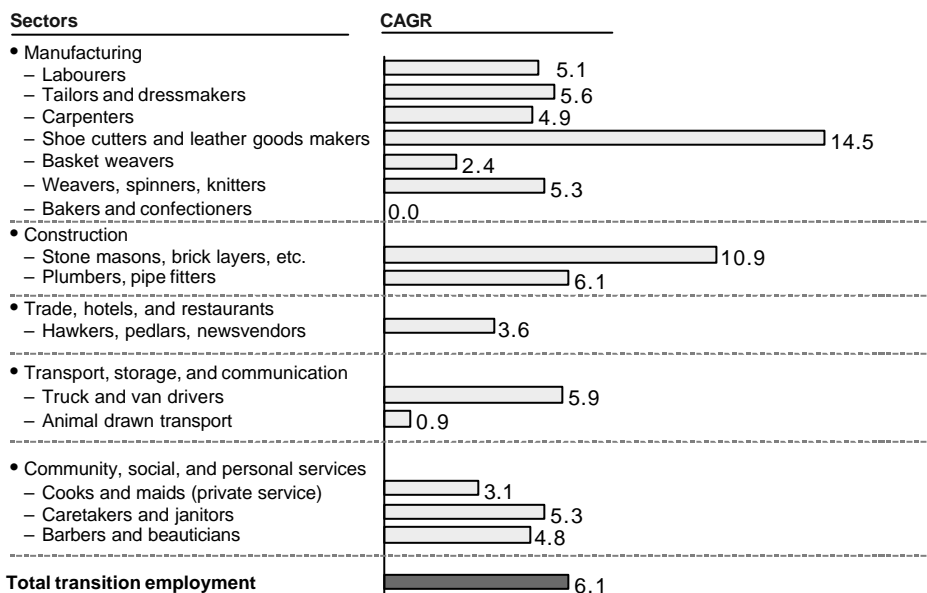


Source: MGI Korea report

Exhibit 5.12

TRANSITION OUTPUT TRENDS IN THAILAND, 1970-1990

Per cent

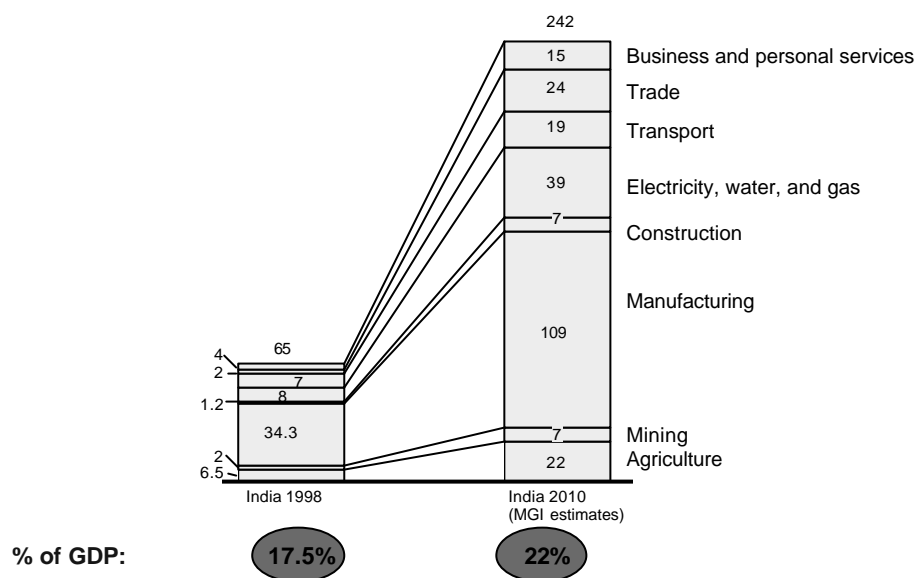


Source: Thailand labour survey; Interviews with economists from Thailand Development Research Institute; McKinsey analysis

Exhibit 5.13

BUSINESS INVESTMENT SPLIT BY SECTOR

US\$ billion



Source: Statistical online of India, 1998-99; MGI Korea Report; McKinsey analysis

Exhibit 5.14

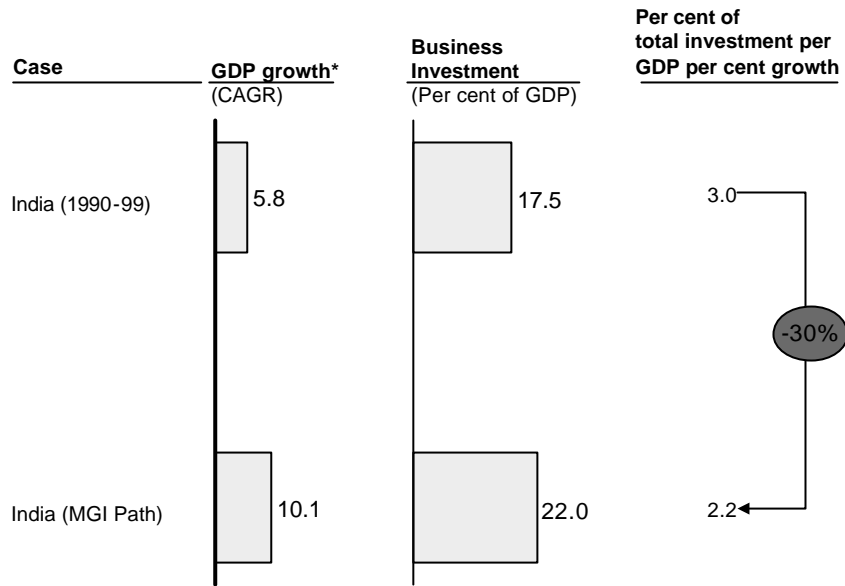
CASE LEVEL ESTIMATES OF INVESTMENT REQUIREMENTS

US\$ billion

Case	Maintenance	Upgrades	New capacity (including maintenance)	Total needed for next 10 years	Examples
Dairy farming	0.0	0.2	20.2	20.4	• Cross bred cows
Wheat farming	4.8	2.1	0.0	6.9	• Full tractorisation
Dairy processing	0.6	0.0	0.9	1.5	• New processing plants
Wheat processing	0.2	0.0	0.5	0.7	• New atta mills
Retail	31.7	47.6	21.7	101	• Supermarkets, counter stores
Housing construction	2.0	0.2	9.4	11.6	• Hand tools
Apparel	2.8	0.5	3.4	6.7	• New plants
Automotive	0.8	0.2	4.4	5.4	• Automation and new plants
Retail banking	0.5	3.4	0.0	3.9	• Automating manual branches
Power: T&D	21.3	2.0	117.3	140.6	• More transmission lines
Generation	32.0	4.9	174.4	211.3	• More power plants
Steel	3.9	1.0	25.4	30.3	• More plants and automation
Telecom	5.2	1.0	54.3	60.5	• Toolkits and new lines
Software	0.9	0.0	3.7	4.6	• Computers
Total	106.7	63.1	435.6	605.4	

Exhibit 5.15

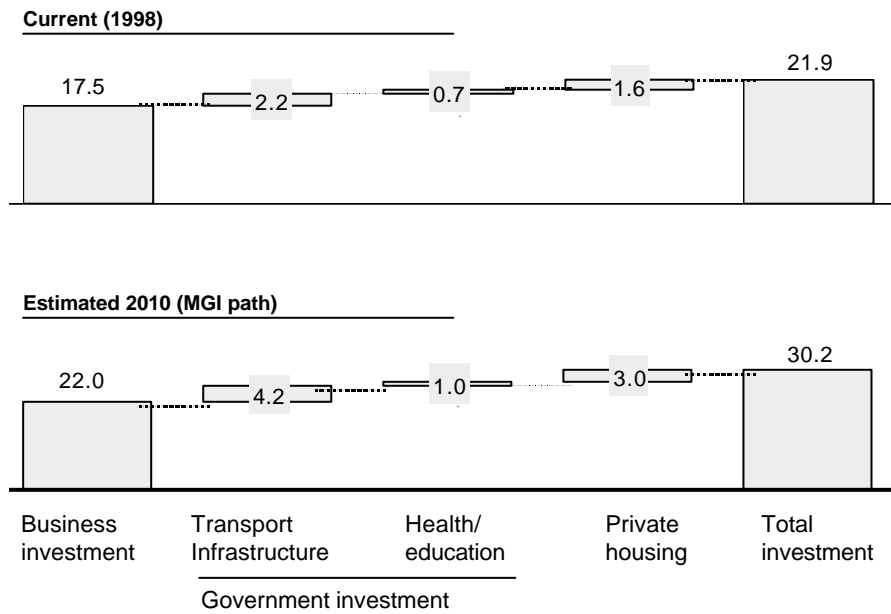
INDIAN REQUIRED BUSINESS INVESTMENT RATES



Source: World Development Indicators; McKinsey analysis

Exhibit 5.16

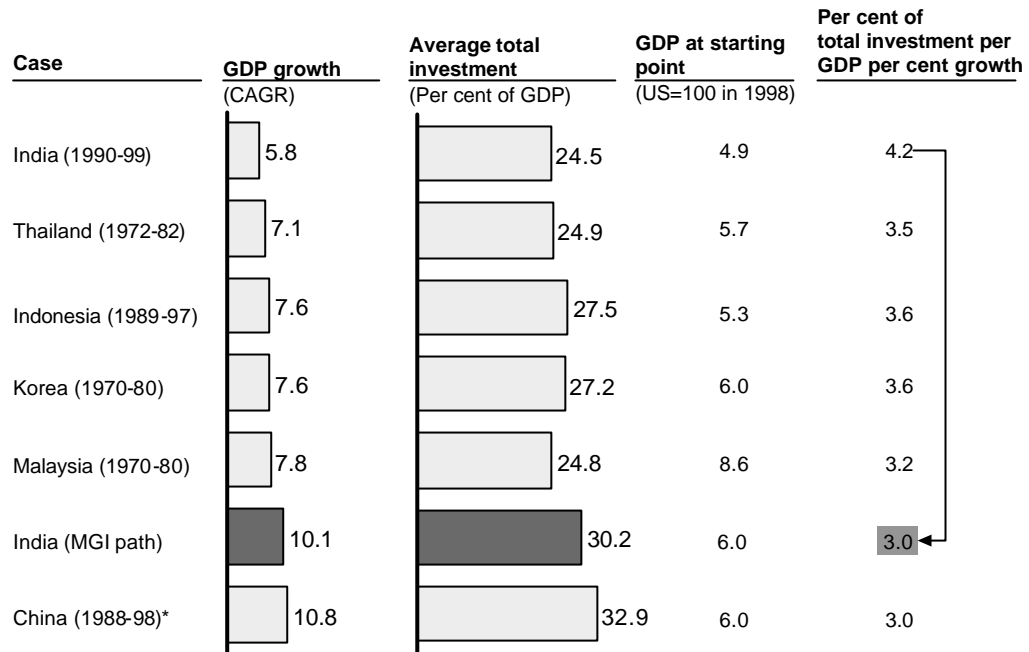
DECOMPOSITION OF TOTAL INVESTMENT Per cent of GDP



Source: CMIE

Exhibit 5.17

INTERNATIONAL BENCHMARKS OF INVESTMENT REQUIREMENTS



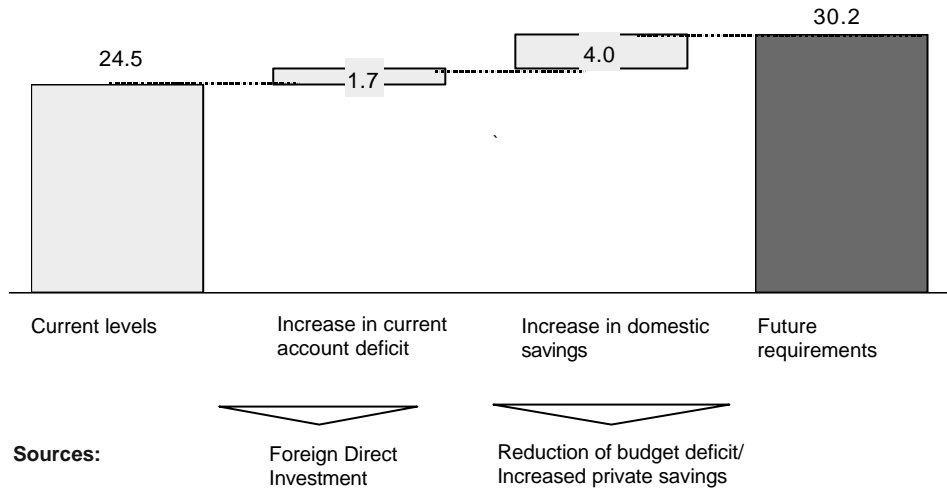
* According to Chinese official statistics

Source: World Development Indicators; McKinsey analysis

Exhibit 5.18

REQUIRED INVESTMENT RATE IS WITHIN INDIA'S REACH

Per cent of GDP



Source: Interviews; McKinsey analysis

Exhibit 5.19

FDI COULD AVERAGE 2.2% OF GDP OVER NEXT 10 YEARS

US\$ billion

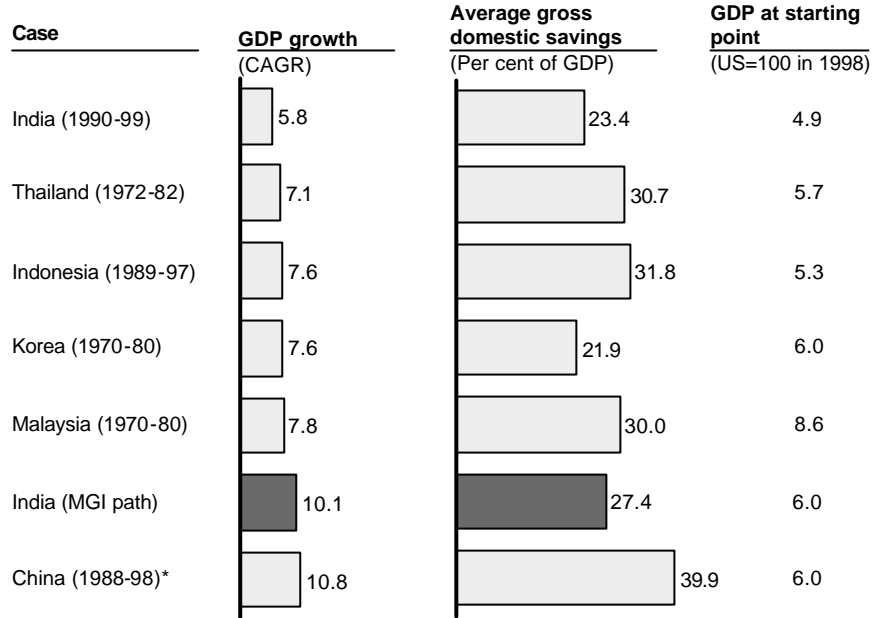
	FDI as a % of GDP*	FDI Cumulative (1990-98) US\$ billion
Malaysia	5.7	41
China	5.2	261
Poland	3.2	22
Mexico	2.7	38
Thailand	2.3	20
Indonesia	1.9	61
Brazil	1.5	154
US	1.1	875
Russia	0.8	13
India	0.5	16.2

* Average for 1993-98 period

Source: World Investment Report (1999), World Development Indicators

Exhibit 5.20

INTERNATIONAL BENCHMARKS OF GROSS DOMESTIC SAVINGS

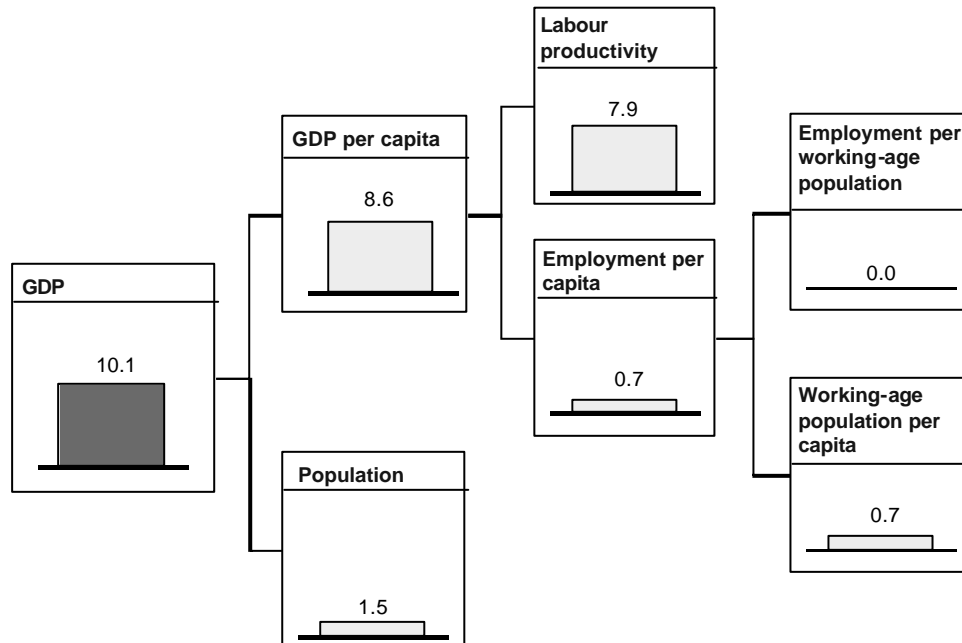


* According to Chinese official statistics

Source: World Development Indicators; McKinsey analysis

Exhibit 5.21

COMPLETE REFORMS: ESTIMATES OF OUPUT GROWTH, 2000-2010 CAGR

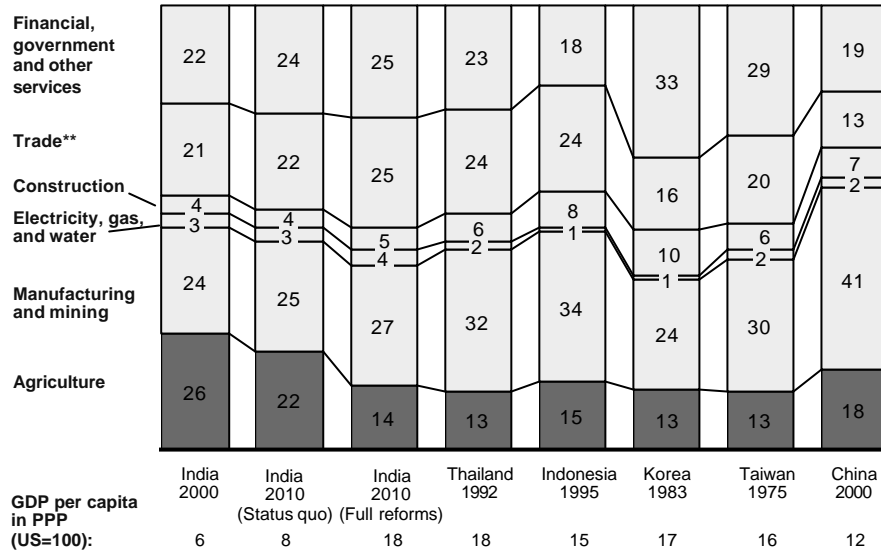


Source: McKinsey analysis

Exhibit 5.22

INTERNATIONAL BENCHMARKS OF GDP SPLIT BY SECTOR*

Per cent



* Using national accounts-based pricing

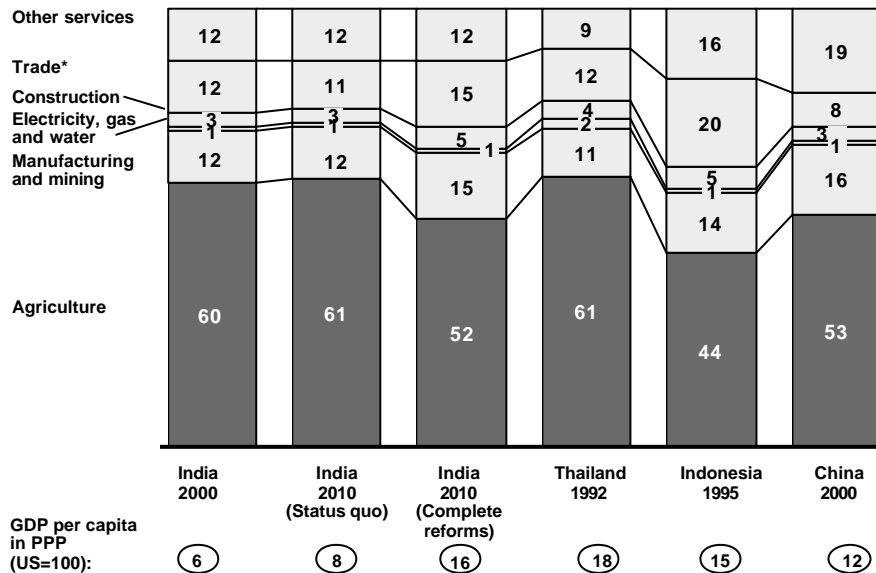
**Includes trade, hotels and restaurants, transport, storage, and communication

Source:McKinsey analysis

Exhibit 5.23

INTERNATIONAL BENCHMARKS OF EMPLOYMENT SPLIT BY SECTOR

Per cent



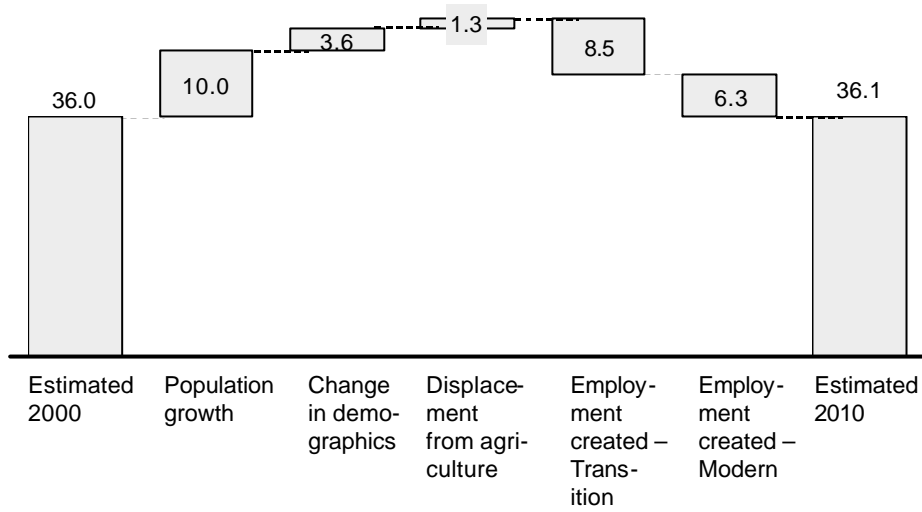
*Includes trade, hotels and restaurants, transport, storage, and communication

Source:McKinsey analysis

Exhibit 5.24

SHARE OF IDLE HOURS UNDER COMPLETE REFORMS

Per cent

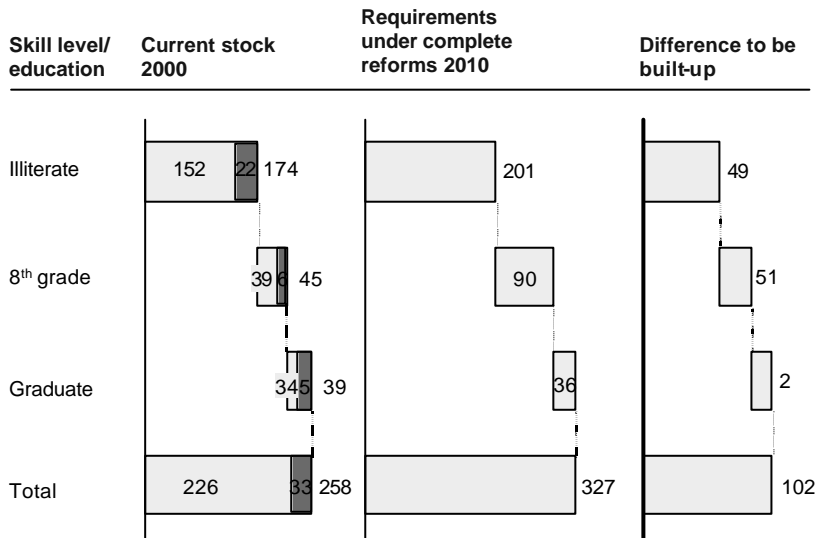


Source: NSS; India Manpower Profile, 2000; McKinsey analysis

Exhibit 5.25

AGGREGATE SKILL REQUIREMENTS UNDER COMPLETE REFORM

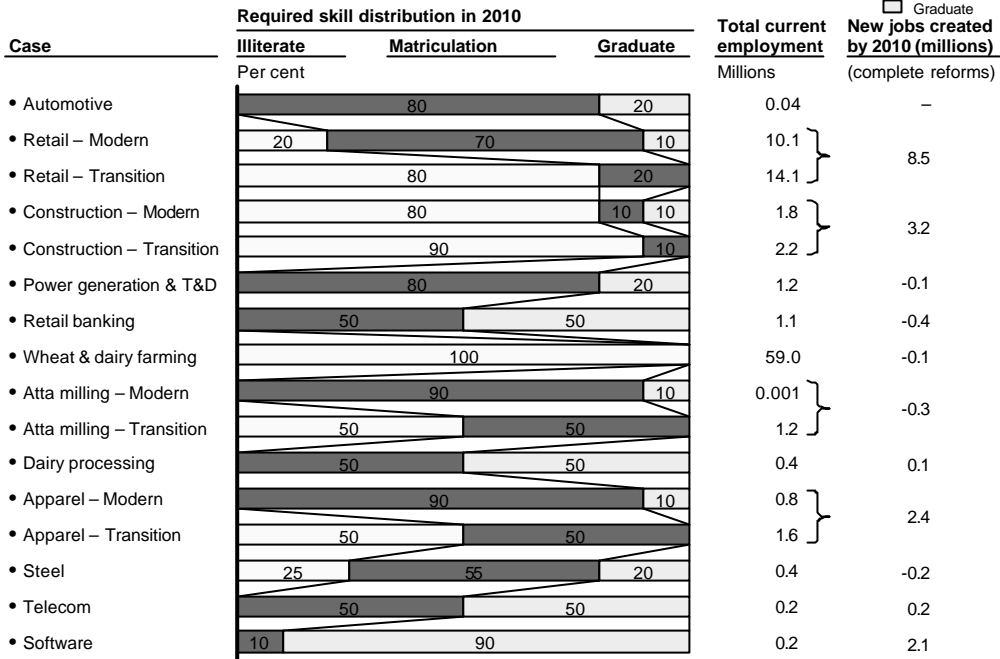
Workforce retiring by 2010



Source: Manpower Profile of India; NCAER; McKinsey analysis

Exhibit 5.26

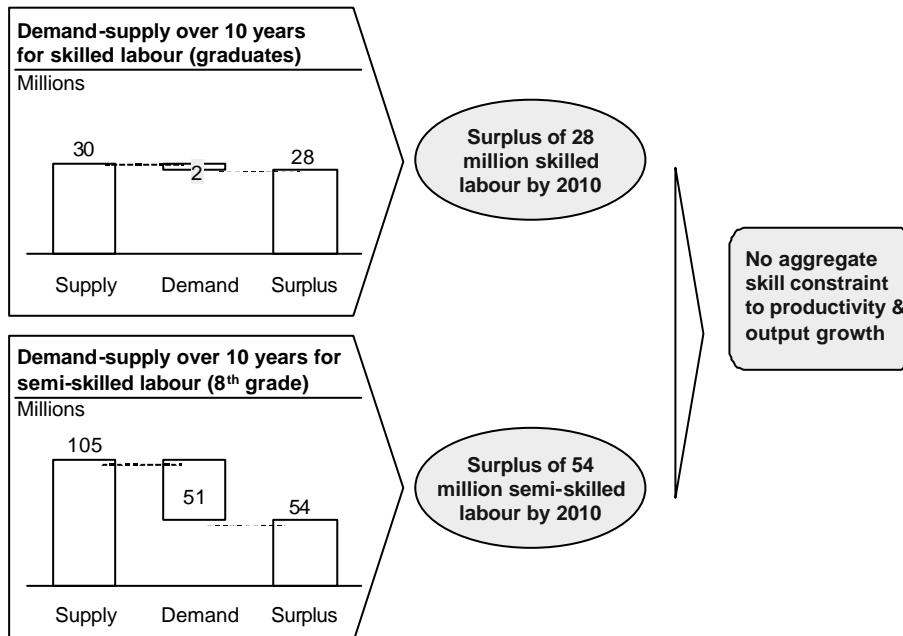
REQUIRED DISTRIBUTION OF SKILLED LABOUR IN CASES



Source: Interviews; McKinsey analysis

Exhibit 5.27

TESTING FOR SUPPLY OF SKILLED LABOUR

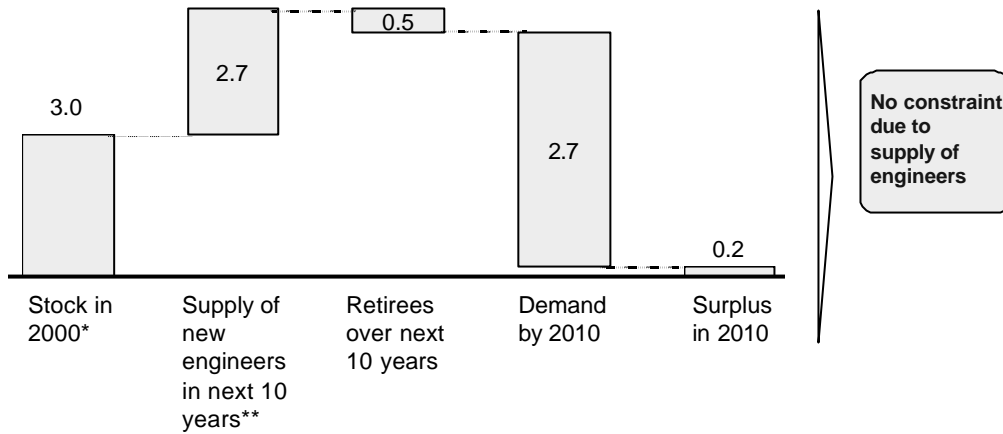


Source: Ministry of Human Resource Development; McKinsey analysis

Exhibit 5.28

TESTING SUPPLY OF ENGINEERS AS A CONSTRAINT TO OUTPUT GROWTH

Millions



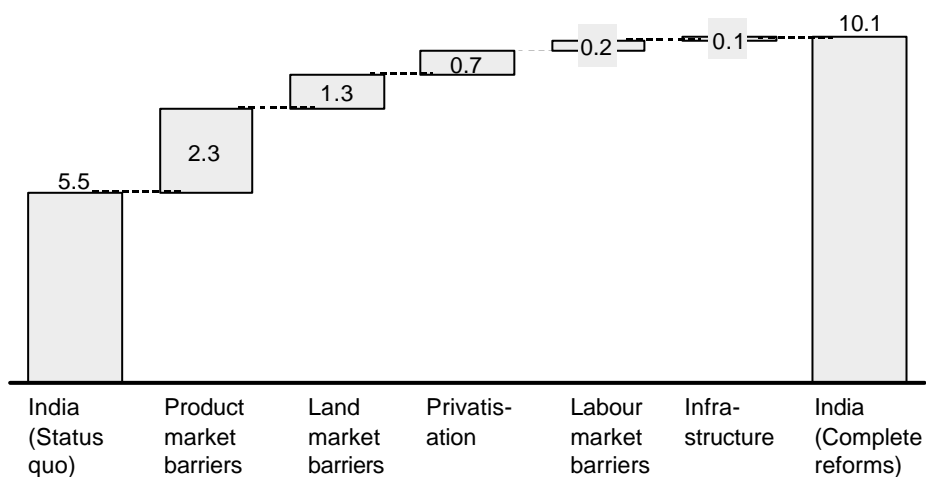
* Includes all engineers and diploma holders graduated after 1970

** Assuming an annual increase of 10% in the output of engineers over the next 10 years

Source: Ministry of Human Resource Development; McKinsey analysis

Exhibit 5.29

BARRIERS TO ACHIEVING 10% GDP GROWTH CAGR (2000-2010)



Source: McKinsey analysis

Exhibit 5.30

LABOUR PRODUCTIVITY BARRIERS QUANTIFIED AT CASE LEVEL

Per cent of total

Case	Govt ownership	Capital market	Labour market	Product market	Land market	Related industry	Infra- structure
Automotive	-	-	70	24	-	6	-
Retail – Modern	-	-	9	45	35	11	-
Retail – Transition	-	-	9	45	35	11	-
Construction – Modern	-	-	6	8	75	11	-
Construction – Transition	-	-	6	8	75	11	-
Power Generation	60	-	10	22	-	8	-
Power T&D	80	-	2	18	-	-	-
Retail banking	75	-	7	8	-	10	-
Wheat farming	-	-	-	24	-	76	-
Dairy farming	-	-	-	-	-	100	-
Wheat milling – Modern	-	-	-	95	-	5	-
Wheat milling – Transition	-	-	-	95	-	5	-
Dairy Processing	36	-	9	25	-	30	-
Apparel – Modern	-	-	10	55	-	20	15
Apparel – Transition	-	-	10	55	-	20	15
Steel	28	-	12	33	-	27	-
Telecom	66	-	8	26	-	-	-
Software	-	-	-	33	-	67	-
AVERAGE	19	-	9	47	18	23	2

Source: McKinsey analysis

Exhibit 5.31

OUTPUT BARRIERS AT CASE LEVEL

Per cent of total

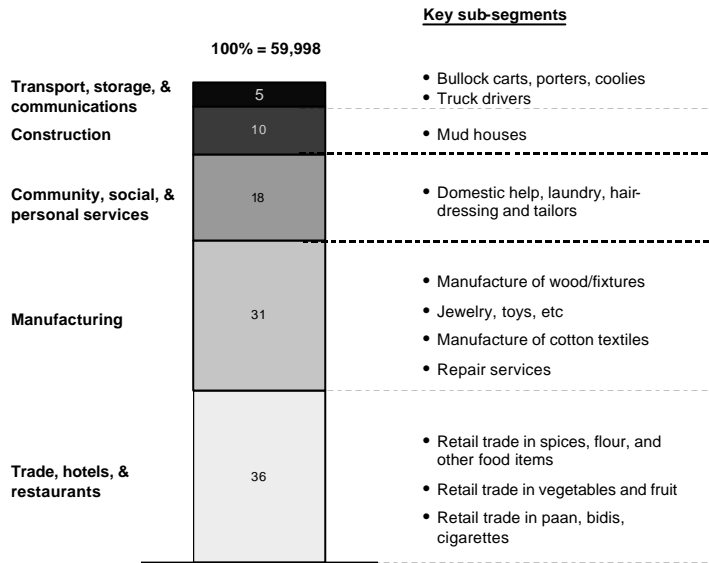
■ Adjusted for output only barriers

Case	Govt ownership	Capital market	Labor market	Product/land market	Product/land market	Related industry	Infra-structure
Automotive	-	-	25	75	-	-	-
Retail – Modern	-	-	-	35	45	11	-
Retail – Transition	-	-	-	35	45	11	-
Construction – Modern	-	-	-	8	75	10	-
Construction – Transition	-	-	-	8	75	10	-
Power Generation	-	-	-	-	-	100	-
Power T&D	80	-	2	18	-	-	-
Retail banking	30	-	5	30	-	30	-
Wheat farming	-	-	-	24	-	76	-
Dairy farming	-	-	-	-	-	100	-
Wheat milling – Modern	-	-	-	95	-	5	-
Wheat milling – Transition	-	-	-	95	-	5	-
Dairy Processing	-	-	-	70	-	30	-
Apparel – Modern	-	-	10	55	-	20	15
Apparel – Transition	-	-	10	55	-	20	15
Steel	25	-	-	40	-	35	-
Telecom	25	-	-	75	-	-	-
Software	-	-	25	25	-	50	-
AVERAGE	13	-	6	38	18	23	2

Source: McKinsey analysis

Exhibit 5.32

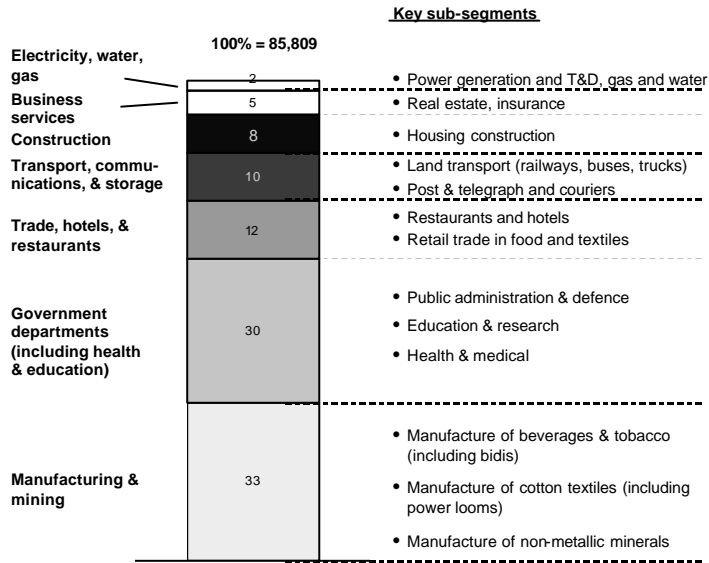
RECLASSIFICATION OF EMPLOYMENT IN INDIA: TRANSITION
'000



Source: Census of India; NSS; McKinsey analysis

Exhibit 5.33

RECLASSIFICATION OF EMPLOYMENT IN INDIA: MODERN
'000

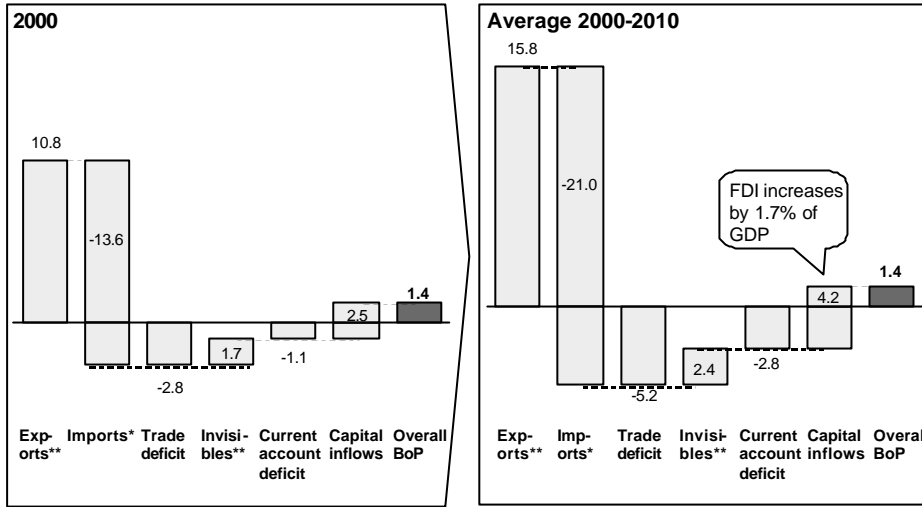


Source: Census of India; NSS; McKinsey analysis

Exhibit 5.34

INCREASE IN FDI WILL FINANCE INCREASE IN CURRENT ACCOUNT DEFICIT

Per cent of GDP



* CIF value of imports

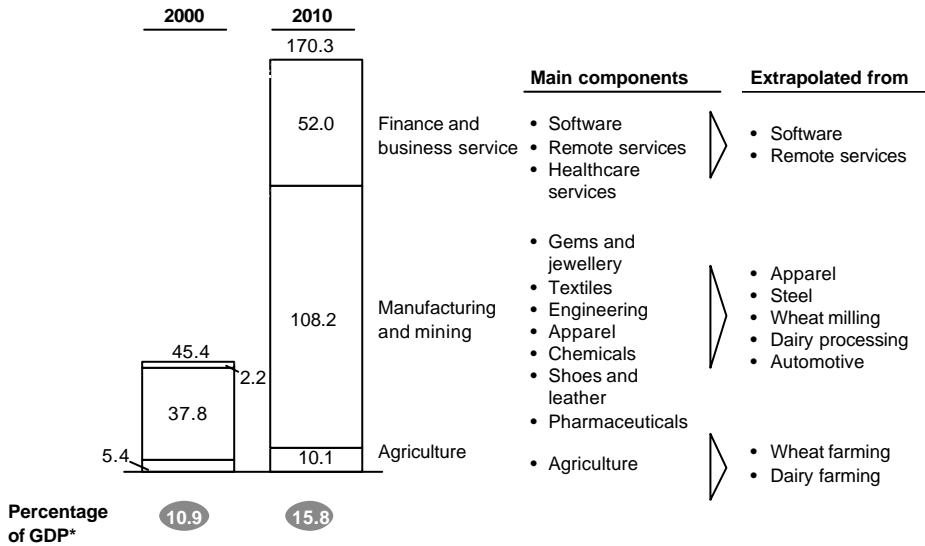
** Software exports are counted in exports and hence excluded from invisibles

Source: RBI; CMIE; National Accounts Statistics, 2000; McKinsey analysis

Exhibit 5.35

ESTIMATED COMPOSITION OF INDIAN EXPORTS IN 2010 UNDER FULL REFORMS

US\$ billions



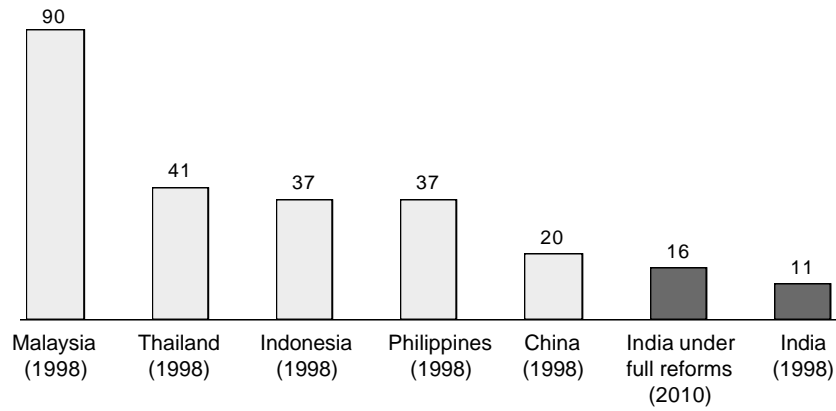
* Total value (rather than value-added) for exports. Assumes constant value-added to value ratio for export goods

Source: CMIE; NASSCOM; McKinsey analysis

Exhibit 5.36

INDIAN EXPORTS COMPARED TO BENCHMARK COUNTRIES

Exports as a per cent of GDP*



* Total value (rather than value-added) for exports

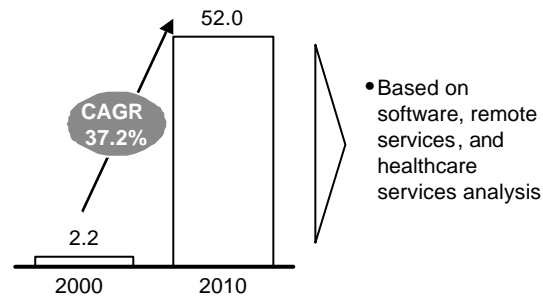
Source: *The Economist*, 2001

Exhibit 5.37

ADDITIONAL SERVICE EXPORTS UNDER FULL REFORMS

US\$ billion

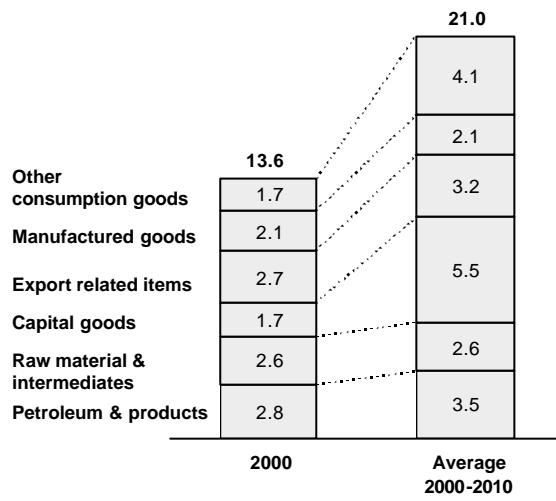
Total services*



Source: NASSCOM; interviews; McKinsey analysis

Exhibit 5.38

IMPORTS WILL INCREASE FROM 13.6% TO 21.0% OF GDP BY 2010
Per cent of GDP



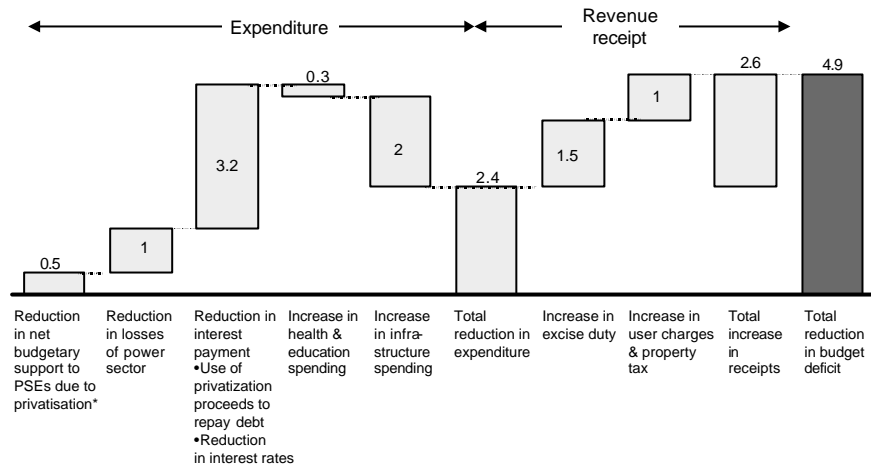
Source: RBI; CMIE; National Accounts Statistics, 2000; McKinsey analysis

Exhibit 5.39

INDIA COULD INCREASE INFRASTRUCTURE AND SOCIAL SPENDING WHILE REDUCING BUDGET DEFICIT BY 4.9% OF GDP

Per cent of GDP

Impact of removing productivity barriers

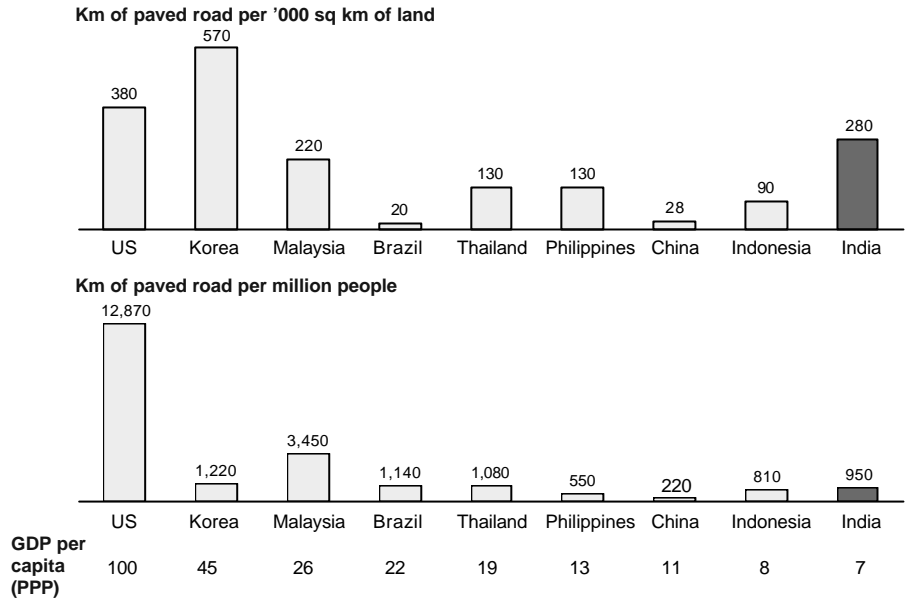


* Includes support for capex, maintenance, part funding of losses, and loss of dividend and other receivables

Source: Government of India Budget papers; CMIE; McKinsey analysis

Exhibit 5.40

PAVED ROAD DENSITY

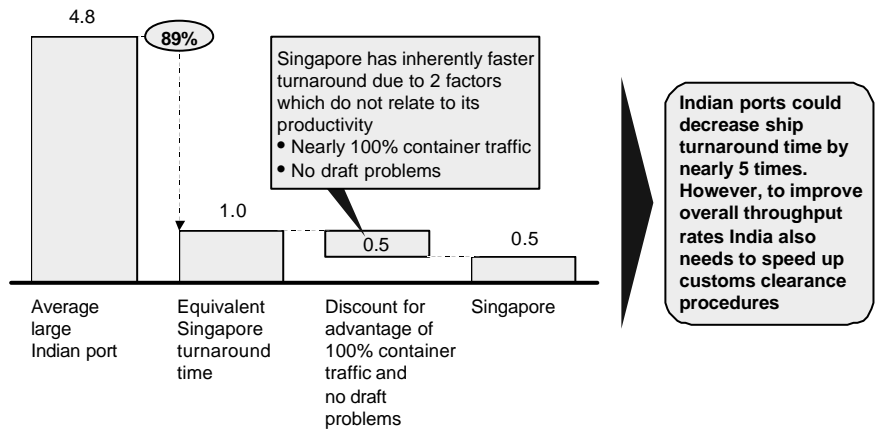


Source: Global Competitiveness Report, 1998; *The Economist*; Worldbank

Exhibit 5.41

POTENTIAL EFFICIENCY INCREASE IN INDIAN PORTS

Ship turnaround time, days



Source: CMIE; PSA

