

Chapter 7

Realizing the Opportunities Presented by the Global Trade in IT-Based Services

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Advances in information technology (IT) and global connectivity, combined with waves of economic liberalization, have given rise to a new dimension of globalization: cross-border trade in services. The service sector has been growing steadily and already accounts for 70 percent of employment and 73 percent of gross domestic product (GDP) in developed countries and for 35 percent of employment and 51 percent of GDP in developing countries (UNCTAD 2008). As infrastructure and skills improve in developing countries, cross-border trade in services is expected to continue to expand.

This chapter aims to help policy makers take advantage of the opportunities presented by increased cross-border trade in IT services and IT-enabled services (ITES). It begins by defining the two industries and estimating the potential global market opportunities for trade in each. Then it discusses economic and other benefits for countries that succeed in these areas. It also analyzes factors crucial to the competitiveness of a country or location—including skills, cost advantages, infrastructure, and a hospitable business environment—and examines the potential competitiveness of small countries and of least developed countries. The chapter concludes by discussing policy options for enabling growth in the IT services and ITES industries.

Much of the analysis and policy advice presented here is based on inputs from consultants, policy experts, and industry leaders, including work conducted by McKinsey

& Company under a recent consulting engagement with the World Bank and the Information for Development Program (*infoDev*). Analysis based on expert knowledge was found to be more useful than efforts to conduct quantitative analysis of various policy options. The large number of potential explanatory variables would require extensive data that are not yet available given the limited number of countries with significant experience in the IT services and ITES industries.

Large Markets and Growing Opportunities

IT services typically include IT applications and engineering services, while ITES involve a wide range of services delivered over electronic networks (table 7.1). These are two broad segments, however, and the sophistication of the services in each varies considerably.

Estimating the market size for trade in IT services and ITES is difficult given definitional issues and the relative novelty of the field. Official statistics are often not available or not reliable, and calculations based on balance of payments and trade in services do not accurately isolate IT services and ITES. As a result, much of the data on the size of the current market comes from private surveys, consulting firms, and anecdotal evidence. According to McKinsey estimates, the annual addressable market for IT services and

Table 7.1 Types of IT Services and IT-Enabled Services

IT services		IT-enabled services
Application services	Engineering services	Business process services
Application development and maintenance	Manufacturing engineering	Horizontal processes
Application development	Upstream product engineering	Customer interaction and support (including call centers)
Application development integration and testing	Concept design	Human resource management
Application maintenance	Simulation	Finance and administration
System integration	Design engineering	Supply chain (procurement logistics management)
Analysis	Downstream product engineering	Vertical processes
Design	Computer-aided design, manufacture, and engineering	Banking
Development	Embedded software	Insurance
Integration and testing	Localization	Travel
Package implementation	Plant and process engineering	Manufacturing
IT infrastructure services	Software product development	Telecommunications
Help desks	Product development	Pharmaceuticals
Desktop support	System testing	Other
Data center services	Porting ^a /variants	Knowledge process outsourcing
Mainframe support	Localization	Business and financial research
Network operations	Maintenance and support	Animation
Consulting	Gaming	Data analytics
IT consulting		Legal process and patent research
Network consulting		Other high-end processes

Sources: Adapted from BPAP (2007) and data from McKinsey & Company.

a. *Porting* is the process of adapting software to run on a different computer and/or operating system.

ITES is approximately \$475 billion. Less than 15 percent of that market, however, is being exploited—about \$65 billion in 2007 (figure 7.1).

Among the various segments of IT application services, opportunities are large in traditional services (about \$100 billion),¹ system integration (\$50 billion), application development and maintenance (\$43 billion), and consulting (\$6 billion). For IT engineering services, opportunities are significant in mechanical design and production (about \$45 billion), embedded software (\$40 billion), and plant engineering (\$35 billion).

Estimates of the market size of ITES vary significantly. According to Gartner Research (2007), the global market is expected to grow from \$160 billion in 2007 to \$235 billion in 2011. But estimates by NASSCOM (National Association of Software and Services Companies)-Everest (2008) are more than three times that amount, at \$700 billion–800 billion by 2012, out of a total cost base of \$17 trillion for key industry

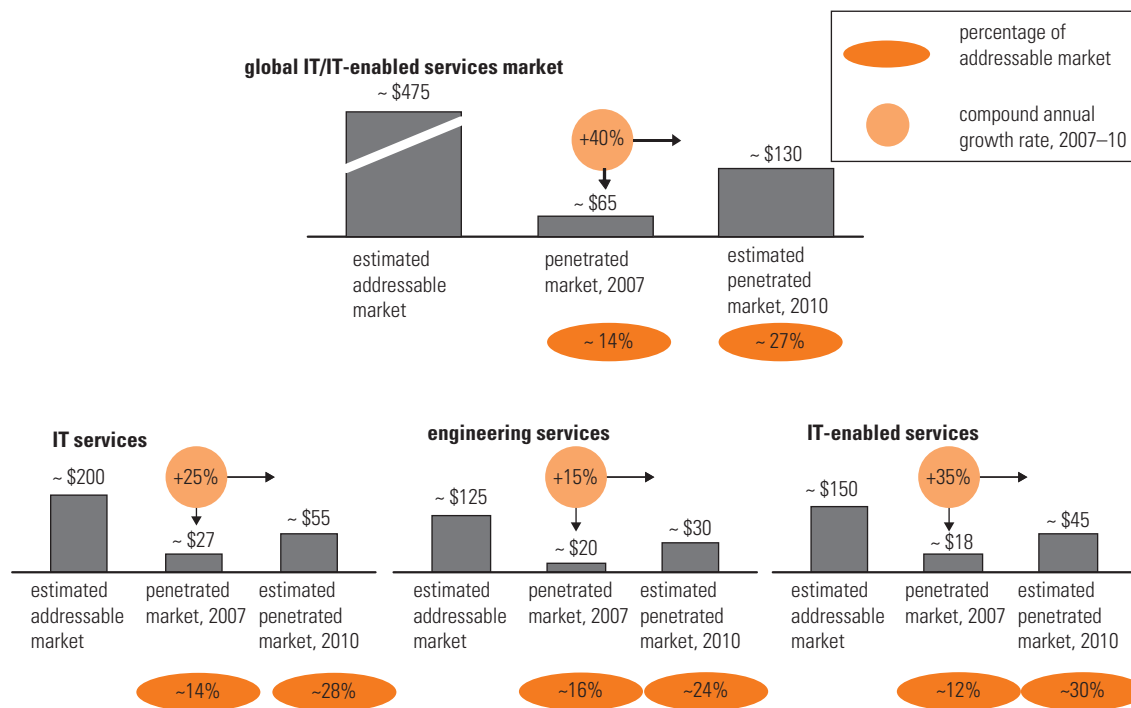
verticals in source markets.² Most estimates of the addressable ITES market are derived by estimating spending on a range of business process functions and evaluating the potential for delivering such functions remotely. Figure 7.2 shows the relative importance of various vertical and horizontal functions in India's ITES industry.

Despite the variation in estimates, it is clear that the demand for IT services and ITES is very large, and that only a small percentage of the potential has been realized. The limiting factors appear to be on the supply side. Countries that meet the requirements of the untapped market are likely to experience rapid growth in their IT and ITES sectors.

Economic Impacts of Developing IT and ITES Industries

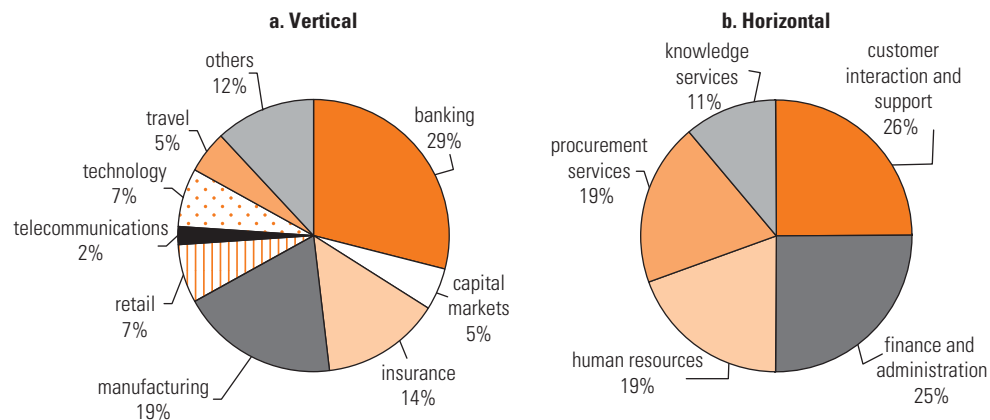
India is the global leader in the provision of both IT services and ITES (figure 7.3). Two developed countries—Canada and

Figure 7.1 Global Opportunities for IT Services and IT-Enabled Services
(US\$ billion)



Source: McKinsey & Company.

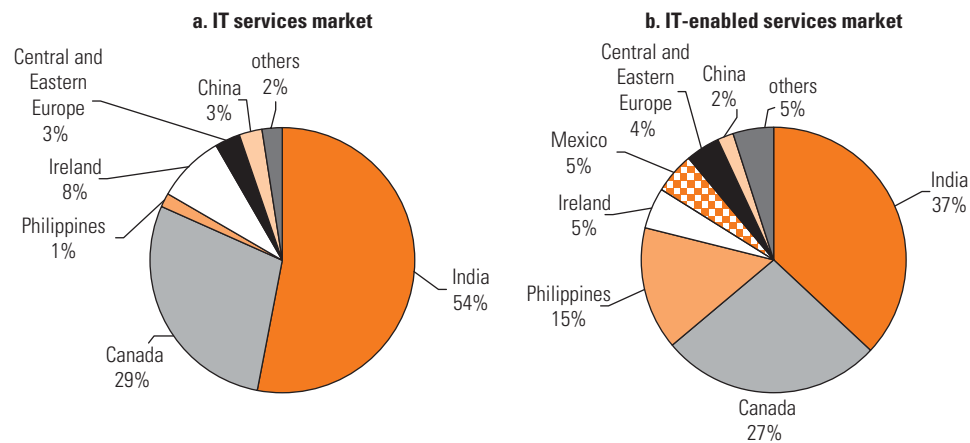
Figure 7.2 India's Addressable Market for Vertical and Horizontal IT-Enabled Service Functions



Source: NASSCOM-Everest 2008.

Ireland—have also done particularly well in the industries, as have a few developing countries, notably China, Mexico, and the Philippines. Several countries in Central and Eastern Europe (the Czech Republic, Hungary, Poland, Romania, and Russia) have also developed their capacity in IT services and

ITES, though on a much smaller scale. The expansion of IT services and ITES has provided these countries with a wide range of economic and social benefits. In India, the Philippines, and Ireland, for example, the industries have created jobs, raised incomes, and increased exports and GDP.

Figure 7.3 Global Distribution of Offshore IT Services and IT-Enabled Service Markets

Sources: McKinsey & Company 2008; NASSCOM-Everest 2008; Tholons 2006.

India

The best-known IT services and ITES success story is India. In 2007–08,³ total exports of IT services and ITES from India stood at \$40.4 billion (\$23.1 billion in IT application services, \$6.4 billion in engineering and research and development (R&D) services, and \$10.9 billion in ITES). The IT services and ITES industries contributed one-quarter of the country's total exports and nearly half of service exports in 2007.⁴ In addition to the exports, \$11.6 billion of domestic software services were also produced. In sum, IT services and ITES represent 5.5 percent of India's GDP and together grew at a remarkable rate of 33.7 percent in 2007 (NASSCOM 2008a). Going forward, India's IT services and ITES exports are forecasted to reach \$60 billion by 2010, when the sector is expected to represent almost 7 percent of GDP (NASSCOM-McKinsey 2005).

A study on the output linkages of India's IT services and ITES sectors conducted by Credit Rating Information Services of India Limited (CRISIL) concluded that the total turnover of \$30.3 billion for the sectors in 2005–06 implied spending of \$14.3 billion in the domestic economy, which in turn generated additional output of \$14 billion in sectors linked to IT services and ITES (NASSCOM-CRISIL 2007).⁵

The IT services and ITES industries have an important impact on the labor market in India. The industries directly employ 2.01 million people in jobs that pay 50 to 100 percent more than comparable service sector jobs. Nearly 80 percent of these jobs (1.56 million) cater to exports of IT services and ITES, while another 0.45 million serve the domestic market. In addition, the sectors create indirect employment

opportunities in industries such as construction, retail, transport,⁶ and telecommunications, as well as induced employment due to higher spending on goods and services such as food, transportation, entertainment, health, and medical services. McKinsey estimates that each new job in IT services and ITES in India has led to the creation of between three and four new jobs in other sectors (NASSCOM-McKinsey 2005).⁷ Other estimates put the number of new non-IT/ITES jobs at four for each job created in IT services and ITES (NASSCOM-CRISIL 2007). Altogether, an estimated 8 million to 10 million employees directly or indirectly support the IT services and ITES industry in India.

The Philippines

The Philippines is another important beneficiary of international trade in IT services and ITES, as it is now one of the top destinations for IT services and ITES companies in the world. Growth of the sector in the Philippines has been impressive: total IT services and ITES revenues were on track to reach \$6.8 billion in 2008, up from \$100 million in 2001 (*The Philippine Star* 2008). As of mid-2008, the industries employed 345,000 people, up from 100,000 in 2004. Moreover, in the Philippines, as in India, workers in this sector are typically paid 50 to 100 percent more than in other service jobs and tend to fall into the top income quintile (Roxas-Chua 2008).

The BPAP projects that it is possible for the IT services and ITES industries in the Philippines to continue their rapid growth, doubling their combined share of the global market from 5 percent to 10 percent and producing revenues

of about \$13 billion and direct employment for close to 1 million people by the end of 2010. Employment of this scale means that the sector would account for 27 percent of all new jobs created in the country by 2010.⁸

The BPAP estimates that each new job created in IT services and ITES in the Philippines results in two to three new jobs in other sectors. An increase in direct employment of 600,000 people by 2010 would therefore create 1.2 million–1.8 million additional new jobs indirectly as employees consume housing, food, transport, and consumer goods and employers invest in telecommunications, building rentals, water, and other core services. By 2010, the IT services and ITES industries could represent as much as 8.5 percent of GDP (BPAP 2007).

Ireland

Ireland has built an IT services and ITES sector that is widely regarded as essential to the country's rapid economic growth. Until the late 1980s, Ireland was the poorest country in Western Europe and suffered from deteriorating infrastructure, high unemployment (20 percent), and a well-documented brain drain to the United States, the United Kingdom, and elsewhere.

In the years since, directed efforts by the Industrial Development Agency (IDA) to build the country into an IT services and ITES destination using corporate tax incentives, enterprise zones, and other incentives, along with European Union (EU) aid and successful marketing efforts, resulted in a high-tech industry that employed 80,000 people by 2000. The call center program introduced by the IDA in 1992 was particularly successful: by mid-1998, around 50 call centers employed 6,000 people, twice as many as the original plan (Barry and van Welsum 2005).

The direct economic impact of the growth of IT services and ITES in Ireland has been mainly from activity in financial and other ITES services. Following the establishment of the International Financial Services Center (IFSC) in 1987, almost 450 international financial institutions operate in Dublin, including half of the world's top 50 banks and half of the top 20 insurance companies. The IFSC focuses on international wholesale banking and treasury, securitization, fund management, fund administration, and insurance (Economist Intelligence Unit 2008). Financial services companies employ 16,000 people and pay an estimated 15 percent of all corporate tax in Ireland.

Other Impacts: Social Benefits, Policy Reforms, and Country Brand

Success in the IT services and ITES sector engenders a number of other positive impacts. An important one is the positive impact on the status of women. Women account for about 65 percent of the total professional and technical workers in IT services and ITES in the Philippines. In India, women make up 30 percent of the IT services and ITES workforce—a much higher rate of female participation than in the service sector in general—and the share is expected to grow to 45 percent by 2010. In Ireland, 70 percent of call center employees are women. In all these cases, women represent a greater number of high-paying jobs than in most other sectors of the economy.

In addition to direct economic and social benefits, a focus on developing the IT services and ITES sector can catalyze fiscal, regulatory, and legal reforms. Policy reforms are often easier to enact when a “new” export-oriented sector such as IT services and ITES is targeted, since entrenched special interests are less directly affected than when reforming other sectors. This appears to have been the case in several states in India, where IT services and ITES companies have been exempted from many of the regulations that make doing business in India a slow and uncertain process. As the value of more efficient fiscal, regulatory, and legal regimes becomes increasingly appreciated, innovations and reforms can be extended to other sectors of the economy.

Finally, success in IT services and ITES presents opportunities for repositioning the image of a country, a “branding” effect that can have profound implications. In India, the positive impact of industry leaders such as Genpact, Wipro, TCS, and Infosys points to this effect. As one commentator put it, “More importantly, [the IT sector's] impact was psychological. It signaled to the world that India was much more than its old historical stereotypes. It suddenly . . . made the world think that every Indian was smart and could fix [its] computers. That helped entrepreneurs in India from all industry segments because it gave them a more receptive environment in which to do business” (Masani 2008).

Assessing Potential Competitiveness

Governments that wish to take advantage of global opportunities in IT services and ITES can benefit from a structured assessment of the strengths and weaknesses of

their countries' locations. In recent years, a number of consulting firms have developed benchmarking frameworks, locational indices, and rating criteria for determining the readiness and attractiveness of different locations for IT services and ITES industries. Among these studies, there is broad agreement that several key

factors determine locational competitiveness: availability of employable skills (including IT skills), competitive costs, quality of public infrastructure relevant to the IT services and ITES industries, and an overall environment that is conducive to business. Table 7.2 provides a more detailed list of factors in each of these categories.

Table 7.2 Frameworks for Assessment of Locations for IT Services and IT-Enabled Services

AT Kearney's Global Services Location Index	Gartner's 10 criteria	Hewitt's International Benchmarking Model	McKinsey's Locational Readiness Index
People and skills availability	Infrastructure	Infrastructure	Quality of infrastructure
Remote service sector experience and quality ratings	Power	Real estate	Telecom and network
Labor force availability	Telecommunications	Telecom	Real estate
Education and language	Transport	Power	Transportation
Attrition risk	Labor pool	Connectivity	Power
Financial attractiveness	Quality	Talent	Talent
Compensation costs	Quantity	Availability	Availability
Infrastructure costs	Scalability	Quality	Suitability
Tax and regulatory costs	Work conditions	Cost	Willingness
Business environment	Educational system	General demographics	Accessibility
Country environment	Quality	Environment	Trainability
Infrastructure	Number of institutions	Macroeconomic	Cost
Cultural exposure	New grads in IT	Business environment	Labor cost
Security of intellectual property	Cost	Geopolitical environment	Infrastructure cost
	Labor	Clusters	Corporate tax
	Real estate	Incumbent IT/ITES industry	Market maturity
	Infrastructure		IT/ITES employees as percentage of total service sector employment
	Telecom		IT/ITES as percentage of services GDP
	Political and economic environment		Presence of industry association
	Stability of government		Risk profile
	Corruption		Regulatory risks
	Geopolitical risks		Country investment risks
	Financial stability		Data protection
	Language		Other incentives
	Government support		Environment
	Promotional		Government support
	Institutional		Business and living environment
	Education		Accessibility
	Cultural compatibility		Living environment
	Cultural attributes		
	Adaptability		
	Proximity		
	Ease of travel		
	Global and legal maturity		
	Data and intellectual property security and privacy		

Source: Authors' summary.

Talent Pool

Together with the existence of competitive broadband telecommunication markets, the availability of employee skills is the single most important factor in the growth of the IT services and ITES sectors. In fact, their growth has created a situation in which skills scarcity creates opportunities for countries new to the industries to offer and develop strong local talent pools. India, which has about 30 percent of the global supply of low-wage labor for the IT services and ITES industries (McKinsey Global Institute 2005), is likely to have a talent shortfall of 0.8 million–1.2 million by 2012 (NASSCOM-Everest 2008). In 2007, India's top five IT companies alone hired 120,000 new employees, and many Indian companies have begun recruiting from international talent pools. TCS, for example, now employs more than 10,000 non-Indians, who make up 9.1 percent of its staff (Wadhwa, de Vitton, and Gereffi 2008). Just five years ago, the company employed fewer than 100 non-Indians.

A typical assessment of the university graduate talent pool by an IT services or ITES company considers a number of aspects, including the following:

- Suitability for employment—that is, meeting a quality standard for work in the industry and having the necessary language (not necessarily English) skills. In a study conducted by the McKinsey Global Institute, an assessment of the available talent pool across 28 developing countries found that, on average, only about 13 percent of generalist graduates had the necessary qualifications (including language) for being employed in the sector (Farrell 2007). Education content is rarely aligned with industry needs.
- Willingness to work in the industry—a function of both the stature of the industry and other job options available.
- Accessibility—that is, proximity to a proposed IT/ITES site or a willingness to relocate.
- Trainability—that is, of the nonemployable cohort, the number who could be employable following short-term training courses.

An important consideration for many large companies is the scalability of the suitable talent pool, that is, whether it is large and growing so that firms can scale up their businesses without having to look for talent in another location. In addition to the above factors, companies considering investment in IT services and ITES also look at parameters

such as average retention and turnover rates, maximum number of hours in a work week, average premium for overtime work, minimum wage, conditions of employment mandated by legislation, regulations on severance and termination of employees, restrictions on expatriates working in the country, and ease of travel clearances for visiting executives (Sutherland Global Services 2008).

Cost

Primary cost considerations, from the point of view of a company making an investment decision, include the cost of labor (from entry-level employees to seasoned managers); infrastructure costs; selling, general, and administrative expenses (SG&A); and facilities costs. Table 7.3 presents an illustrative example of the share of different cost components for IT services and ITES businesses and suggests that the most important cost elements are wages, physical infrastructure, and training.

The evaluation of cost also reflects fiscal or other incentives provided by the government to encourage investment, as well as tariff or trade restrictions regarding imports and exports, corporate tax rates, regulations on profit remittances and repatriation of capital, capital gains on assets and other property transfers, and special incentives and tax holidays. Companies assess the different business taxes (value added tax [VAT], withholding tax, excise duties, stock transaction taxes, capital gains tax, documentary stamp tax, customs duty, and local taxes), and also seek information on tax treaties and their effects on tax rates (Sutherland Global Services 2008).

Table 7.3 Relative Percentage of Components in the Total Cost of Offshoring

Cost component	IT services firm	ITES firm
Wage rate	46	42
Physical infrastructure and support	18	17
Training and productivity	9	10
Transition and governance	7	8
Communications	3	5
Disaster recovery and business continuity	3	5
Resource redeployment	4	3
Travel costs	3	3
Advisory services	4	2
Exchange rate changes	3	2
Resource redundancy	1	2

Source: Vashistha and Vashistha 2006.

Given the cost advantage of most developing countries compared to developed countries, tax incentives may not be required to enhance the attractiveness of developing country locations. However, they often signal the importance that governments attach to the IT services and ITES sectors and demonstrate governments' commitment to nurturing a conducive business environment for the industries.

Infrastructure

Infrastructure consists of availability, quality, and reliability of services such as telecommunications (including broadband), power, and transportation, along with availability of suitable real estate. Competitive broadband telecommunications markets are a particularly critical factor for the growth of trade in IT services and ITES. In addition to cost and quality, most IT services and ITES companies require redundancy in terms of telecommunication links. It is important, therefore, to ensure that more than one international carrier is available, and that there is more than one international gateway and one international cable linking the location to competitive global communication networks.

In countries with unreliable public infrastructure, companies look for customized facilities such as IT parks—with modern office space, high-speed broadband links, reliable power supply (including backup supply), security services, and ancillary infrastructure including banks, travel desks, restaurants, transportation systems, and hotel accommodation for visiting executives. They also look for availability of land and business-friendly procedures such as quick building clearances for real estate development. The availability of international airports with good flight connections near IT/ITES locations is also an important factor.

Business and Living Environment

The general business and living environment of a country—government policies toward foreign direct investment (FDI), incidence of corruption, labor laws, ease of travel to and from the country, and general quality of life—is also important in a company's decision about whether to invest there. Many of these factors can be more easily controlled by focusing on a discrete sector like IT services and ITES, and later expanding efforts to the broader market environment. There are numerous cases of countries offering special status for IT/ITES investors to speed them through the formalities and insulate them from the more difficult aspects of doing business

locally. The Agency to Promote and Facilitate Investments in Remote Services and Technology (APFIRST) in Andhra Pradesh in India and the IDA in Ireland, for example, cut through red tape to help IT services and ITES companies start local operations, while the broader business environment strengthened more slowly.

The living environment also influences companies' decisions about where to locate in terms of availability of health-care facilities, international schools and other high-quality academic institutions, entertainment facilities, civic infrastructure, public safety, and hygiene.

Country risk relates to stability and transparency of law, macroeconomic stability, treatment of foreign capital, and data and intellectual property law protection, to name a few. Potential investors weigh these risks according to their own history and the risk-taking profile of their management. Companies make decisions about locating IT services and ITES investments based on their assessment of the judicial system, the average duration to resolve disputes, the legal framework for contract enforcement, average time to resolve contractual conflicts, opportunities to arbitrate locally, the legal framework for intellectual property protection, and antitrust laws, among other factors (Sutherland Global Services 2008).

In summary, the elements that make a country an attractive IT services and ITES investment destination are a combination of depth and quality of the talent pool, cost advantage, availability and quality of infrastructure, and other factors that facilitate the smooth and predictable day-to-day running of a business. These factors, with different weightings based on different approaches, tend to be common to the indices and tools used by industry analysts and consulting firms (such as the ones summarized in table 7.2) active in the IT services and ITES industries.

Relative Competitiveness of Small Countries

Given the large addressable market for IT services and ITES, there is an opportunity for many countries to participate and benefit. In recent years, an increasing number of countries have begun to develop their IT services and ITES industries, viewing them as important potential sources of economic growth. South Africa, for example, is emerging as an attractive ITES destination, benefiting from English language abilities (South Africa Online 2005). Similarly, the Arab Republic of Egypt, Morocco, Senegal, and Tunisia are also developing a range of ITES operations, including call

and contact centers, and Israel is starting to emerge as a location for packaged application development.

An important question is whether the opportunities presented by the IT services and ITES sector are possible only for countries with a large talent pool, or whether small economies and least developed countries can benefit as well. Scalability is an important success factor, as many companies prefer locations where scaling up is possible. This is particularly true for large, “commodity” market segments that require a large number of workers with comparable skills, such as telemarketing and consumer support call centers, and providers of standard back-office functions such as accounting and IT support. Countries with large and growing employable labor forces thus may have a competitive advantage in capturing a share of the global IT services and ITES markets.

For a number of niche segments, however, the basis for differentiation may center on factors other than scalability. In R&D, for example, skills quality appears to be a much more important differentiating factor. In addition to the case of Ireland discussed earlier in this chapter, the following country examples illustrate potential growth opportunities in niche segments.

Mauritius. With an area of 2,040 square kilometers and a population of 1.27 million, Mauritius employed approximately 7,000 people in IT services and ITES in 2007, compared to only 2,000 in 2003. Mauritius used the competitive advantage of its historical and cultural ties with India to establish Ebene Cybercity, an IT park. A soft credit from India of \$100 million in 2001, along with a bilateral agreement facilitating travel between India and Mauritius, made it possible to attract investment from a number of Indian companies, including Infosys, which has set up a disaster recovery center on the island (CNET News.com 2003; ITU 2004). Mauritius has successfully attracted leading international players such as Accenture, TNT Group, Teleforma, Ceridian, and EURO CRM (Burton 2007), and has begun transitioning to higher value-added activities such as advisory, design, and legal services (MBOI 2007). As another indication of Mauritius’s success, A.T. Kearney (2007) ranked the country ahead of other locations well known for their attractiveness, in spite of Mauritius’s smaller size, higher costs, and direct competition with the other countries in the francophone market.

Malta. Malta, with an area of 316 square kilometers and a population of 0.4 million, is an even smaller country than Mauritius. The World Economic Forum’s *Global Information Technology Report 2007–2008* ranks Malta third, after Singapore and Tunisia, in terms of government success in promoting information and communication technology (ICT). Between 2001 and 2004, Malta embarked on the e-Malta strategy. In 2008, it launched a new national ICT strategy that aims to make Malta a “smart island” (IDABC 2008). The country has successfully attracted specialized software firms like Crimsonwing, Uniblue, GFI, Anvil, 2i, and RS2, in addition to leading IT players such as Oracle, Microsoft, Hewlett-Packard, and SAP (Malta Enterprise 2008). The call center that HSBC established in Malta for its U.K. operations has grown to over 450 employees (*Times of Malta* 2008). Malta has also become an attractive destination for remote gaming: it now hosts 10 percent of all remote gaming companies in the world, including Betfair, Expekt, Unibet, Interwetten, and CBM Bookmakers (Malta Enterprise 2008).

In 2007, the government embarked on the SmartCity Malta project with a \$300 million investment from Dubai Internet City’s Tecom. Encompassing an area of 360,000 square meters, SmartCity Malta will consist of office, residential, and retail space focused on attracting ICT and media companies (SmartCity Malta 2008). The first phase of the project was inaugurated in June 2008. SmartCity Malta is the largest foreign investment in the island country and the single largest job creation initiative in Malta’s history, committed to creating 5,600 jobs over eight years (OANA 2008).

The examples of Ireland, Mauritius, and Malta suggest that size is not a binding constraint in the potential for countries to benefit from global IT services and ITES opportunities. Small countries can aim at specific niches, leveraging language skills as in the case of Malta; building on historical and cultural ties as in Mauritius; using advantages such as a high-quality living environment as in Singapore; or operating at the high end of the value chain to compete on quality, as in Ireland.

Relative Competitiveness of Least Developed Countries

The question of whether least developed countries have the potential to become players in the global IT services and ITES industries is an engaging issue. Industry experts and

current trends suggest that countries with severe constraints in infrastructure, a small employable labor force, and no clear competitive advantage enabling differentiation in high-end markets may not be immediately attractive to investors and companies looking to establish IT services and ITES operations. Such countries may, however, recognize and plan for the longer-term potential that the industries represent, assuming these constraints can be addressed over time.

Deliberate investment in human resource and infrastructure development, in a manner that is geared to meeting the skill requirements of the IT services and ITES industries globally, is likely to be a sound policy for least developed countries. In a context where companies around the world are learning to operate in different geographies, it can be expected that locations equipped with employable skills, decent infrastructure, and a stable and conducive business environment will be able to take advantage of the opportunities presented by the IT services and ITES industries.

It is important to note that a relatively small investment and a small number of jobs in the IT services and ITES industries can have a considerable impact on the economy of a country. While the IT services and ITES industries currently employ less than 1 percent of the labor force in India, for example, the sector is responsible for one-quarter of the country's exports. Although India may be viewed as a unique case, evidence suggests that the IT services and ITES sectors may contribute just as much to other, smaller economies. The percentage of population employed in the IT services and ITES industries in Mauritius was nearly four times as high as in India in 2007. Least developed countries may see the case of Mauritius as an example and invest in human resources, infrastructure, and the general business environment in their own countries in order to position themselves for success in the medium and long terms.

Policy Options to Enhance Competitiveness

A fundamental question faced by governments is whether to focus on industry-specific policy, such as the development of the IT services and ITES industries, in addition to working to improve the broader business environment.

Policies Targeted at the IT Services and ITES Industries

Opponents of industry-specific policy point to the dismal record of governments in supporting specific sectors, emphasizing that the task is best left to markets. Governments should, in their view, focus on macroeconomic stability, ensure property rights and contract enforcement, and improve the general environment for doing business.

Proponents of targeted industry support point out that (1) countries that have succeeded have seen their governments making deliberate interventions to catalyze growth of the sector; (2) many of the policy enablers needed by the IT services and ITES industries involve “no-regret” interventions that also benefit the rest of the economy; and (3) a broader approach to policy, aimed at the overall business environment and not at the IT services and ITES industries specifically, is likely to miss key interventions and be out of sync with the dynamic needs of these industries.

Countries successful in adopting IT/ITES industry policy.

Although proactive policies may not be a sufficient condition for building successful IT services and ITES industries in an individual country, all the success cases reviewed here have involved active government support—albeit support not necessarily focused on the needs of the IT services or ITES industries.

In India, long-term investment in world-class technology institutes produced a critical mass of technology leaders able to compete globally. In the state of Andhra Pradesh, education policies in the late 1990s and early 2000s liberalized entry of private technology institutes in the tertiary education market, multiplying the number of engineering graduates available for the IT sector in only a few years. The Software Technology Parks of India (STPI) initiative that was launched by the government in 1991 to overcome infrastructural and procedural constraints by providing data communication facilities, office space, and “single window” statutory services was extremely beneficial. The technology parks proved essential to the growth of the industry given the broader context of deficient infrastructure and bureaucratic red tape. India's telecommunications policies of 1994 and 1999 allowed private sector investments into the sector and cleared the path for establishment of alternative international gateways that were also critical to development of the IT services and ITES industries.

In Canada, the government offered special incentives to IT and ITES companies that would develop a significant volume of contact center operations in the Atlantic provinces. Ireland's emergence as an IT and international financial services center is widely recognized as partly the result of proactive government policies that encouraged investment in these industries. In the Philippines, the Board of Investments has actively targeted the IT services and ITES sectors and has been credited by the local industry association for its key role in supporting the rapid growth of the sector.

No-regret interventions. Investments that enable the IT services and ITES industries include those in education, infrastructure, and regulatory reform. All of these in turn contribute to improving the broader business environment. While a less targeted approach may not prioritize these actions in the timeline demanded by the industries, most of the reforms and investments required to develop the IT services and ITES industries can be seen as “no regret” actions. For example, a critical mass of low-cost labor with English language skills, problem-solving abilities, and basic IT proficiency is likely to be useful to other industries in the event that the IT services and ITES industries do not develop. In addition, high-capacity telecommunications infrastructure and modern power infrastructure are likely to benefit other industries. Ancillary investment in IT parks, where the bulk of the development investment is made by private developers, does not represent a large, risky public expenditure (other than the land, which is often provided as equity by governments). In this sense, government support for the IT services and ITES sector is a low-risk strategy and is consistent with the argument that public interventions should create positive externalities.

Institutions and Leadership Following an Adaptive and Engaged Approach to Policy

Locations successful in attracting IT services and ITES companies do more than rely on highly structured strategies—rather, they have leadership and institutions that follow an adaptive and engaged approach to policy. Given the fast-moving nature of the industries globally, the domain of policy and investment promotion is a constantly moving target. Unless the institutional framework is agile, it will be difficult to adapt to changing market conditions and achieve and sustain success. The institutional structures for

promoting IT services and ITES ideally should include a level of government that is sufficiently high to have cross-cutting oversight and should promote close engagement between the public and private sectors in order to adapt policy to evolving opportunities and sources of competitive advantage. A number of examples bear out the efficacy of such an institutional approach.

Ireland's IDA, a government-sponsored development agency funded primarily through government grant-in-aid, has achieved significant success in attracting IT services and ITES investments to the country. The inward investment program launched by the IDA has been a major driving force behind the growth of the Irish economy, contributing to 35 percent of GDP and over 85 percent of manufactured exports (IDA 2006). By its own account, “IDA is a full service national development agency, a so-called ‘one-stop shop.’ It deals with all aspects of inward investment—the planning, promoting, marketing, negotiating and processing of investment proposals; provision of financial incentives and property solutions; helping new investors get started and working with them to maximize their contribution to the Irish economy” (IDA 2006). And 9 of IDA's 13 board members are from the private sector.

Another example of a successful development agency in the context of IT services and ITES is APFIRST (renamed and reconstituted as APInvest in 2005) in Andhra Pradesh. Established in 2001 to promote investment and development in key sectors including offshore IT and business process outsourcing (BPO), APFIRST was set up as a one-stop contact agency, with a dedicated budget for marketing and promotional activities, authorization to grant incentives such as single-window clearances in order to attract investors, and a dedicated account manager for key investors. The agency has been a resounding success.

From 2001 to 2005, when the global ITES industry grew at a cumulative average growth rate of 49 percent, the ITES sector grew at more than twice this rate in Andhra Pradesh (110 percent). Starting from a low base of \$14 million in 1995, Andhra Pradesh's exports of IT services and ITES grew to \$450 million in 2001 and to more than \$6 billion in 2007 (*The Hindu* 2008).

The success of APFIRST illustrates the importance of an investment promotion institution that has cross-cutting oversight. When APFIRST was trying to attract Microsoft to establish a campus in Hyderabad, for example, it had to

work with a number of government departments to clinch the investment. APFIRST negotiated with the Indian School of Business (ISB) to provide part of its land to Microsoft (the ISB was compensated with additional land), facilitated funding of roads to the campus, and arranged for an alternative source of electricity at the site. The 54-acre Hyderabad facility⁹ is the second-largest Microsoft campus in the world, after the company's headquarters in Redmond, Washington. When courting Dell to make an investment decision, APFIRST worked with the Andhra Pradesh State Council of Higher Education to train students who could be hired by Dell for the company's Hyderabad call center. It also worked with telecommunications companies to provide high-speed bandwidth with redundant links for the Dell facility. Since each major company had its own set of requirements, APFIRST's ability to coordinate across government and existing business institutions was critical in successfully attracting new companies.

A holistic marketing and business development focus was another factor contributing to the success of APFIRST. The organization hired a leading management consultancy to obtain market intelligence and identify competitive advantages while simultaneously leveraging the firm (in addition to its own and Andhra Pradesh's leadership) to reach out to key decision makers in top global companies.

Development institutions in Chile and Malaysia have pursued similar relationship building initiatives. Chile's economic development agency, CORFO (Corporación de Fomento de la Producción de Chile), established a partnership with the Thunderbird School of Global Management in Glendale, Arizona, to undertake market research and establish contacts with key organizations such as the American Electronics Association and the San Jose Business Incubator (Nelson 2007). Malaysia set up an International Advisory Committee for its Multimedia Super Corridor to facilitate engagement with leading global players.

In addition to government investment promotion institutions, industry associations can also be effective in carrying out branding and industry promotion initiatives. NASSCOM, for example, has not only played an important advocacy role with policy makers for the IT services and ITES industries, but also has successfully created an India brand that is now recognized internationally (World Bank 2008). NASSCOM's success in a branding initiative has been emulated by agencies in other countries, notably the Brazilian Association of Information Technology and Communication

Companies (BRASSCOM), the Bulgarian Association of Software Companies (BASSCOM), and the Ghana Association of Software and IT Services Companies (GASSCOM).

Governments need to be proactive in attracting strategic anchor investors in order to gain a critical mass of investors. This critical mass can generate dynamic cluster effects and help raise visibility as a potential destination for IT services and ITES. When Andhra Pradesh succeeded in getting Microsoft to locate a software development center in Hyderabad, it became much easier to attract follow-on investments from other high profile companies such as Oracle, IBM, and Accenture, which in turn triggered a cluster effect that encouraged investment from many more companies.

Policy Options for Nurturing and Expanding the Talent Pool

After access to high-bandwidth telecommunications infrastructure, the availability of employable talent is the single most important determinant for the growth of the IT services and ITES industries in the long term. As mentioned above, public education content is too often divorced from the needs of industry. When examining policies related to the talent pool, institutional mechanisms for aligning skills development with the needs and requirements of the industries are in our view the most important factor for success. In this regard, the government of Mexico facilitated a new organization in 2008, MexicoFIRST, founded by Cámara Nacional de la Industria Electrónica de Telecomunicaciones e Informática (CANIETI) and Asociación Nacional de Instituciones de Educación en Informática (ANIEI) to work closely with the Asociación Mexicana de la Industria de Tecnologías de Información (AMITI) and ProSoft, a government agency tasked with promoting the IT services and ITES industries. MexicoFIRST will closely interface with IT and ITES companies on the one hand and Mexican universities on the other to identify the training needs of the companies and to facilitate training programs at the universities to meet those needs.

Another important policy intervention is to improve the quality of education in order to develop generic skills that are relevant to a broad spectrum of industries. An example of this approach is the NASSCOM assessment of competency (NAC) framework, which the organization developed in consultation with a large number of ITES players. The NAC has emerged as India's national standard for generic skills and recruitment of entry-level talent for the ITES industry (NASSCOM 2007), and NASSCOM has rolled out

the framework in partnership with a number of state governments in India. The skill testing themes under NAC are shown in table 7.4. The test scores indicate areas for improvement, allowing customization of further training. NASSCOM has subsequently developed a NAC-Tech certification (NASSCOM 2008b) that is focused on benchmarking engineering skills for the IT industry. This too is being rolled out in partnership with state governments. Applying and enforcing common industry certification not only helps to align skills with industry requirements, but also provide IT services and ITES companies with a more accurate estimate of the talent pool available and reduces their recruitment costs.

Still another important policy intervention aimed at nurturing the talent pool is the establishment of mechanisms to allow just-in-time training for IT services and ITES. A number of countries are providing training grants for this purpose. South Africa offers a training and skills support grant toward the cost of company-specific training up to 12,000 rand (approximately \$1,700) per agent. Under its ICT Capacity Building Program, Sri Lanka offers grants to fund a portion of the training costs of IT services and ITES companies. Sri Lanka also offers grants up to \$10,000 to bring in a specialized trainer from abroad under a “train the trainer” program. In November 2007, the president of the Philippines directed the Technical Education and Skills Development Agency (TESDA) to allocate 350 million pesos (approximately \$8 million) to provide scholarships for training 70,000 call center agents (TESDA 2008). Singapore has a national Skills Development Fund for upgrading worker skills and has launched the Initiatives in New Technology scheme to establish new capabilities within companies or

industries by encouraging manpower development in the application of new technologies, industrial R&D, and professional know-how (SEDB 2008).

Given the significant shortage of skills, many large IT services and ITES companies are taking up skills development initiatives, building dedicated training centers, and employing hundreds of training staff. Infosys’s new Global Education Center in Mysore, India, for example, has more than 300 full-time faculty and is able to train 13,500 employees at a time. The company invested more than \$120 million in this 335-acre, 2-million-square-foot facility. Satyam, after establishing a 240,000-square-foot School of Leadership in India, has announced that it will build a Satyam Technology and Learning Center within Deakin University at Geelong in the State of Victoria, in Australia (Gartner 2008). Given the need to address the shortage of skills, a number of IT services and ITES companies are collaborating with academic institutions. Some examples in India are the following (Wadhwa, de Vitton, and Gereffi 2008):

- Accenture-Xavier Labor Research Institute (XLRI) Academy
- VLSI (very-large-scale integration) Finishing School, established as a partnership between Cadence and the University of California Extension at Santa Cruz
- NIIT Institute of Process Excellence, a joint venture between NIIT and Genpact
- NIIT Institute of Finance, Banking and Insurance, a joint venture between NIIT and ICICI Bank
- Infosys’s “Campus Connect” program, which brings faculty members from 470 engineering colleges to its training institute for a two-week residential training program
- Satyam’s effort to help 103 universities with faculty training, course design, and implementation of e-learning infrastructure
- 24/7’s partnership with 200 colleges and even with high schools to prepare students for the BPO industry.

In addition to IT services and ITES companies’ efforts to create incentives for training potential employees, some governments and universities have used public funding and public-private partnerships to nurture and expand the talent pool. These initiatives have been designed to expand existing university infrastructure and faculty,

Table 7.4 NASSCOM IT-Enabled Services Skill Competence Testing Themes

Test	Competencies assessed
Keyboard skills	Typing speed and accuracy
Spoken English	Voice clarity, fluency, vocabulary, grammar/sentence construction, accent, and situation comprehension
Writing ability (multiple choice and essay)	Message clarity and comprehension
Listening	Comprehension and accent comprehension
Numerical and analytical	Numerical ability and logical reasoning

Source: NASSCOM 2007.

develop competencies that are benchmarked globally, and forge linkages for skills development with private sector and best-in-class institutions (see box 7.1).

Partnerships with leading standards organizations, industry associations, universities, and companies can prove highly advantageous for developing globally benchmarked skills. Universities in the Philippines, for example, offer courses in finance and accounting similar to those in the United States because accounting principles used in the Philippines are modeled after the U.S. generally accepted accounting principles (GAAP). This has made the Philippines a natural choice for U.S. banks and financial institutions seeking to offshore parts of their operations. Similarly, Sri Lanka has a large number of qualified accountants. (The Chartered Institute of Management Accountants [CIMA], one of the world's largest professional accounting bodies, has its second-largest number of management accountants in Sri Lanka, after the United Kingdom.) Consequently, companies engaged in investment research find Sri Lanka to be an attractive offshoring destination.

Examples of other global skills providers related to IT services and ITES include the Customer Operations Performance Center Inc. (COPC), the world's leading authority on operations management and performance improvement for contact centers. Carnegie Mellon's Software Engineering Institute is a world leader in standards such as Capability Maturity Model integration (CMMI) and has developed a range of programs including those relating to improvement of personal and team software processes. Similarly, the Project Management Institute's Project Management Professional credential program is recognized globally.

Policy Options for Reducing Costs

The biggest component of cost in the IT services and ITES industries is labor. While labor costs are typically difficult for a government to influence, some labor market distortions, such as minimum wage laws, severance requirements, restrictions on women working, or restrictions on nighttime work, have the potential to be addressed. The government of the state of Goa in India, for example, exempted the IT industry from the Minimum Wages Act of 1948 because wages in the industry were much higher than minimum wage and IT companies were averse to being subjected to frequent inspections, rent seeking, and bureaucratic requirements surrounding compliance with the act.

This chapter does not advocate indiscriminate use of tax incentives and subsidies, as they may allow inefficient firms and sectors to persist, may result in decreased tax revenue while firms might have invested without the subsidy, and are difficult to withdraw once given (McKinsey Global Institute [2003] elaborates on the convenience and value of tax incentives). Targeted fiscal and other government incentives to catalyze growth of the IT services and ITES industries can, however, be helpful. Toward this end, several governments have decreased net costs experienced by individual firms or lowered the income tax rate for a specific sector. Examples include a reduced income tax rate of 10 percent for key software enterprises identified by the government (China), an income tax holiday on profit from exports (India and Singapore), 100 percent tax exemption for qualifying companies for 10 years (Malaysia) or 7 years (Republic of Korea), 100 percent tax exemption for pioneer status companies (Singapore), and fiscal subsidies linked to the number of jobs created (India). In 2002, the government of India revised Section 10A of the Income Tax Act to allow for accelerated depreciation of up to 60 percent for hardware and other equipment in the first year after purchase for IT services and ITES companies.

Other fiscal benefits include adjustment of capital expenses and VAT, as well as duty waivers for IT equipment. Malaysia, for example, offers a 100 percent deduction on capital expenditures. China imposes no customs duty or import VAT for software companies importing capital equipment. India exempts software from customs duty, allows duty-free imports into IT parks, makes computer systems freely importable, and exempts second-hand computers donated to state schools from customs duties. Korea exempts companies set up with foreign investment from custom duties, VAT, and special excise tax.¹⁰ It also offers a 100 percent exemption from dividend withholding tax for foreign investment in technology.

Policy Options to Address Infrastructure Barriers

Broadband connectivity at globally competitive prices is a necessary condition for a successful IT services and ITES sector. Governments need to create an enabling environment for establishing competitive and effective markets in order to attract investment, extend infrastructure access, and improve service quality. Some form of public-private partnerships may be used to encourage the development of

Box 7.1 Government and University Initiatives in Skills Development for IT Services and IT-Enabled Services

Public funding initiatives. Ireland presents several good examples of publicly funded initiatives to expand existing infrastructure, faculty, and IT curricula at universities, colleges, and schools in order to ultimately expand the IT talent pool. By end-2001, Ireland had invested IRE40 million (approximately \$79 million) in its "Schools IT 2000" initiative, which provided IT equipment, infrastructure and training, and curriculum resources to schools. The University of Limerick has established a College of Informatics and Electronics that brings together the disciplines of mathematics, software, computing, communications, and electronics. The Dublin City University is focused on the development of skills in the areas of business, science and electronics, computer technology, communications, and languages. Business and IT skills curricula were also introduced in other universities. Partly as a result of these efforts, Ireland now has among the highest proportion of science and engineering graduates as a percentage of all university graduates (31.9 percent) in the European Union (Eurostat 2004).

Partnerships with private sector and best-in-class institutions. Various governments have played a critical role in encouraging ICT-related partnerships with the private sector and academic institutions. Singapore has been one of the most proactive in this regard, starting with the creation of the Industrial Training Board (ITB) in 1973. The ITB established an extensive system of training advisory committees with industry participation, introduced industry-based training schemes in partnership with companies, and established arrangements for keeping training staff abreast of the latest technological developments. The last of these was done, for example, through memorandums of understanding with companies including Mitsubishi Electric Asia, Robert Bosch (SEA), Siemens, IBM, Cisco, and Sun Microsystems (Lee and others 2008). The SEDB also began working with large companies to set up specialized training facilities, such as the ones for Tata Group's precision engineering plant in Singapore. The InfoComm Development Agency of Singapore has been active in forging global partnerships to improve ICT sector skills. For instance, in 2006 it partnered with Carnegie Mellon University's Entertainment Technology Center and the National University of Singapore's School of Computing in order to develop a degree program in interactive digital media (CMU 2006).

In Malaysia, the Penang Skills Development Centre (PSDC) is a joint partnership between the government, academia, and industry.^a Established in 1989, it has a membership of 141 companies and is led by the private sector. The Chittagong Skills Development Center^b in Bangladesh is a similar public-private partnership focused on skills development for the ICT, manufacturing, and services sectors. The Center was established in 2006 in partnership with the PSDC, government agencies, industry associations, and ICT companies such as Alcatel, Ericsson, Huawei, and ZTE.

The government of Andhra Pradesh in India is yet another interesting example of proactive promotion of public-private partnerships (IIIT 2007). The International Institute of Information Technology (IIIT) in Hyderabad was started in 1998 with initial support of buildings and seed funding by the state government. Over time, the IIIT has become an autonomous, self-supporting institution and has developed active relationships with major IT companies including IBM, Signal Tree, Motorola, Oracle, and Satyam, all of which have set up corporate schools on the campus. Andhra Pradesh has also partnered with Dell and GE to offer company-specific training courses in colleges to prepare students for eventual recruitment by those companies.

a. See <http://www.psd.com.my/index.cfm> (accessed August 3, 2008).

b. See <http://www.csd.com.bd/> (accessed August 3, 2008).

broadband networks in commercially unattractive areas; such partnerships have been used for underserved areas in India, Malaysia, Spain, Uganda, and elsewhere (chapter 4 contains a detailed discussion on policies for promoting telecommunications backbone networks).

Korea is a well-known leader in broadband, as a result of policies including full liberalization of the telecommunications market; leveraging of private investment for rapid roll-out of broadband infrastructure; and provision of public funding to facilitate uptake of broadband services by citizens, businesses, and public institutions. Rapid deployment of broadband provided important opportunities for Korea's IT industry, and the sector is growing three times faster than the rest of the economy. Particularly fast-growing subsectors include development of search engines and local content. In addition, Korea has developed a competitive advantage in niches of the IT industry, such as online gaming, where Korean companies are the biggest global players (see the analysis in chapter 3 on the economic impact of broadband).

In countries where overall infrastructure is underdeveloped, practical second-best solutions such as IT parks may be justified in order to cluster businesses and thus ease the provision of efficient, high-quality infrastructure services required for development of the IT services and ITES industries. Such an approach may also be helpful in forming a critical mass of investors and attracting a group of support services.

The success of the Stanford Industrial Park (later Stanford Research Park) in California in the United States, which morphed into what is now Silicon Valley, has inspired some governments to establish or facilitate the setting up of IT parks with ambitions beyond provision of basic infrastructure. While there are numerous examples of this, the Malaysian government's development of the Multimedia Super Corridor (MSC) has been one of the more prominent initiatives. Conceptualized in 1996, the MSC aspired to make Malaysia a global IT hub. It has generated revenues of more than RM 13 billion (approximately \$4 billion) and 63,000 knowledge-based jobs (MSC Malaysia 2008). More recently, the Dalian Tiandi Software Hub in China is being developed as the "world's largest software, IT service hub" (Livemint.com 2007). The hub will have an area of over 26.5 square kilometers and is funded by private sector investments expected to exceed \$2.5 billion (*China Economic Review* 2008).

In 2005, the government of Morocco built the CasaShore zone with world class infrastructure and services and rental costs in line with the most competitive destinations. Building

this IT park not only provided the resources that companies need to do business successfully in Morocco, but also clearly signaled the government's commitment to developing the IT services and ITES industries. Likewise, the government of Kenya announced in 2008 that it will develop a 5,000-seat BPO technology park, with a budget of K Sh 900 million (approximately \$13 million) already allocated for financing the initial part of the project (Kenya ICT Board 2008). In another case, that of Hitec City in Hyderabad, the government of Andhra Pradesh contributed land as 11 percent equity into the project and provided ancillary infrastructure such as roads, electricity feeders, water, and sewage systems, while Larsen & Toubro was responsible for all other investment in the park.

Competitive incentive packages are often offered for companies to locate to these parks, such as subsidies on the costs of telecommunications (such as in Kenya) and other utilities (such as in the state of Orissa in India). One-stop support services at IT parks range from administration and training to legal and financial services.

Policy Options to Improve the Broader Business Environment

Beyond general policies addressing the broader business environment, policy options include freeing parts of the IT services and ITES industries from burdensome regulation and in some cases providing support from a state agency that has the mandate and the authority to guide businesses through the bureaucratic labyrinth that remains.

The bureaucratic burden may be decreased by removing some licensing requirements and providing expedited approvals for qualifying companies on remaining requirements. Industrial licensing was abolished in India for the electronics sector except for manufacturing electronic aerospace and defense equipment. ITES was declared an "essential services industry" in some of the states in India, allowing "365 × 24 × 7" operations otherwise prohibited by law. In some states in India, a "deemed approval" system that provides automatic approvals if government agencies did not respond to a company request within a stipulated number of days was initiated, and a self-certification option allowed for qualifying companies to self-certify compliance with legal and statutory requirements.

A number of online connectivity and privacy issues are also important elements of the broader business environment that may need to be addressed. Chief among them are

the legal validity of online transactions, data security and data privacy protection, Internet protocol (IP) protection, and safeguards against misuse of computing infrastructure (cyber-crime). The enabling environment for legal recognition of online transactions is essential for the IT services and ITES industries. Examples include China's Electronic Signature Law 2005, the formation of a cyber appellate court and digital certification under India's IT Act 2000, and the Malaysian Communications and Multimedia Commission Act. Malaysia's Digital Signature Act and Computer Crimes Act, Singapore's Computer Misuse Act and Electronic Transaction Act, enacted in 1998, and Korea's Protection of Information Infrastructure Act 2001 are examples of attempts to provide assurance against the misuse of computers and computing infrastructure. With regard to intellectual property rights, countries can start by bringing patent, copyright, and trademark laws in line with international conventions such as Trade-Related Aspects of Intellectual Property Rights (TRIPS), as China, India, Korea, Malaysia, and Singapore have done, or the World Intellectual Property Organization (WIPO) Copyright Treaty, which China, Korea, Peru, Senegal, and Singapore (to name a few) have signed onto. Raising awareness about these issues in the legal community and among police, prosecutors, and judges is also key.

Movement of capital can be made freer and double taxation can be avoided by permitting 100 percent FDI into IT services and ITES companies and IT parks (as China, India, Malaysia, and Singapore have done), working to form tax treaties with jurisdictions to which earnings would be repatriated (as China, India, Korea, and Singapore have done), and by establishing export agencies such as the Malaysia External Trade Development Corporation (MATRADE) to facilitate trade between local producers and foreign buyers.

Conclusions

The global market for IT services and ITES is large and growing. Limitations to growth are mostly on the supply side, in particular in terms of employees with skill sets that meet the requirements of the market. The globalizing market for skills, however, allows developing countries to take advantage of their cost advantage in terms of labor and to make investments in expanding the skills of their labor forces in order to make them suitable for employment in the

fast-growing global IT and ITES industries. Successful participation in the industries has been shown to have a positive impact on job creation, exports, economic growth, and social development.

Locations with comparatively large talent pools will have an advantage in attracting IT services and ITES companies because large companies prefer to source services from locations where scalability is feasible. This is particularly true for "commodity" services such as contact centers and standard back-office IT and accounting functions. Recent successes of small countries show that opportunities exist in a range of niche and higher value-added segments where small countries may be able to compete successfully. The timing and scale of gains differ, however, according to a country's skill endowments, infrastructure, cost advantages, and business environment. Countries that are severely constrained in terms of infrastructure and skills may need to focus on longer-gestation programs to develop their talent pools and basic infrastructure, and thus will take longer to realize the benefits of hosting IT services and ITES companies.

In countries that have succeeded in the IT services and ITES industries, governments have adopted a proactive role in promoting the sector. Such support can often be provided with low levels of public funding by leveraging private sector investments. Most of the public interventions to promote the industries—improving education, providing broadband infrastructure, or streamlining government interfaces with business—are essentially "no-regret" moves that carry little risk.

Locations that have successfully developed IT services and ITES appear to have empowered industry development institutions to follow adaptive and engaged approaches to policy. Winning policy development efforts are characterized by adaptation to the rapidly evolving needs of the industries and by ongoing engagement between government leaders and the industries. The private sector can provide governments with invaluable information and insights on available opportunities, market trends, and future skill requirements, and engagement between private and public sectors can also help overcome investment constraints in key areas of infrastructure and human resource development. Given the importance of skills as a driver of growth of the IT services and ITES industries, a focus on quality of education in close alignment with local and global industry needs is essential.

Finally, the importance of leadership for promoting the IT services and ITES industries must be underscored. Extensive commitment and support from the highest echelons of government are essential to make rapid and deliberate policy choices, to implement them effectively, and to overcome bureaucratic resistance.

Notes

1. Traditional services include hardware and software maintenance, network administration, and help desk services.
2. Verticals refer to industries such as banking, insurance, and telecommunications. Horizontals refer to functions common across industries, such as human resource management, finance and administration, and marketing. Verticals account for 60–65 percent of the addressable ITES market, while horizontals account for 35–40 percent.
3. India's financial year is April 1 to March 31.
4. According to the *Economic Survey 2007–08* conducted by the Ministry of Finance, India's total exports in 2006–07 were \$128 billion, of which \$76.2 billion were service exports. (See <http://indiabudget.nic.in/es2007-08/esmain.htm>, accessed on August 2, 2008.) Total IT services and ITES exports during 2006–07 were \$31.3 billion, which represents 41 percent of India's service exports.
5. Twenty-six percent of gross income spent by employees was housing related, followed by food items, durable goods, and vacation/leisure. In addition, IT services and ITES firms contributed to increased nonwage spending on construction, transportation, communications, and a host of other sectors.
6. According to the NASSCOM-McKinsey Report 2005, the most important employment generation opportunities will occur in construction (an estimated 1.4 million construction site workers will be employed in FY 2010 to meet the demand to develop additional commercial and residential real estate), retail (1.5 million–1.75 million employees in FY 2010), and transport (650,000–700,000 drivers and assistants will be required to meet industry requirements in FY 2010).
7. According to the report, the “two industries (IT and BPO) directly employ nearly 700,000 people and provide indirect employment to approximately 2.5 million workers” (page 15).
8. Some commentators find this overly optimistic, for example, Magtibay-Ramos, Estrada, and Felipe (2007).
9. The facility consists of the India Development Center, Microsoft IT-India, and the Microsoft Global Services Center.
10. This exemption is applicable to high-technology and large-scale manufacturing industries.

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