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The Global Opportunityⁱⁿ IT-Based Services

ASSESSING AND ENHANCING
COUNTRY COMPETITIVENESS

Randeep Sudan
Seth Ayers
Philippe Dongier
Arturo Muenta-Kunigami
Christine Zhen-Wei Qiang

infoDev



THE WORLD BANK

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Foreword

The dynamic growth of the services sector globally, along with rapid advances in information and communication technology (ICT), are creating new opportunities for economic growth, social empowerment, and grassroots innovation in developing countries. It has been estimated that ICT-based services represent a \$500 billion addressable market, of which only about 20 percent has been realized. Moreover, ICT-based services offer significant direct and indirect employment opportunities, particularly for youth and women.

With this book, the World Bank and the Information for Development Program (*infoDev*) aim to provide policy makers with a practical guide for developing and deploying policies to grow ICT-based services in their countries and for informing their understanding of the key drivers that investors and operators use to select potential locations for such services. The book reviews country examples and extracts policy lessons and good practice. It also includes a description of a Location Readiness Index, a diagnostic tool designed for policy makers.

It is our hope that this volume will help policy makers to more effectively harness the potential of ICT-based services to generate economic opportunities with lasting impact.

Mohsen A. Khalil
Director, Global Information and Communication Technologies
The World Bank Group

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Much of the analysis and policy advice presented in this book 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*). In particular, valuable input, guidance, and support at various stages of the preparation of the manuscript were received from Mohsen A. Khalil, director of the Global Information and Communication Technologies (GICT) Department of the World Bank Group, and Valerie D'Costa, manager of *infoDev*, which is a multidonor grant facility housed at GICT. Other World Bank staff contributed as well. Manju Haththotuwa, Vincent Palmade, Ismail Radwan, and Shahid Yusuf provided a number of useful suggestions and comments as peer reviewers. Inputs were also provided by Lacinda Barrow, Tim Kelly, Mohan Kharbanda, Xiaomin Mou, and Eloy Vidal. Special mention must be made of the stellar support provided by Sandra V. Sargent and Siou Chew Kuek in the development of the Location Readiness Index.

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Association; Kiran Karnik, president of the National Association of Software and Services Companies (India) (NASSCOM); Mitch Locsin, executive director of Business Processing Association of the Philippines (BPAP); and Mfanu Mfayela, chief executive officer of Business Process enabling South Africa (BPeSA).

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Abbreviations

\$	All dollar amounts are U.S. dollars unless otherwise indicated.
APFIRST	Agency to Promote and Facilitate Investments in Remote Services and Technology (Andhra Pradesh, India)
BHTV	Bandung High Tech Valley (Indonesia)
BPAP	Business Processing Association of the Philippines
BPO	business process outsourcing
CRISIL	Credit Rating Information Services of India Limited
EIU	Economist Intelligence Unit
EU	European Union
FDI	foreign direct investment
FTE	full-time equivalent
GDP	gross domestic product
GICT	Global Information and Communication Technologies (Department)
ICT	information and communication technology
IDA	Industrial Development Agency (Ireland)
IFSC	International Financial Services Center (Ireland)
IIIT	International Institute of Information Technology (India)
<i>infoDev</i>	Information for Development Program (housed at the World Bank)
ISB	Indian School of Business
IT	information technology

ABBREVIATIONS

ITB	Industrial Training Board (Singapore)
ITES	IT-enabled services
LRI	Location Readiness Index
Mbps	megabits per second
MSC	Multimedia Super Corridor (Malaysia)
NAC	NASSCOM assessment of competency
NASSCOM	National Association of Software and Services Companies (India)
PSDC	Penang Skills Development Centre (Malaysia)
R&D	research and development
SEDB	Singapore Economic Development Board
SG&A	selling, general, and administrative expenses
TESDA	Technical Education and Skills Development Authority (the Philippines)
VAT	value added tax

Trends and Opportunities for Developing Countries

Advances in information technology (IT) and global connectivity, combined with waves of economic liberalization, have given impetus to a new dimension of globalization: cross-border trade in services. The services sector now 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 book 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, along with 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 specifically. The volume also discusses policy options for enabling growth in the IT services and ITES industries. Appendix A introduces the Location Readiness Index (LRI), a modeling tool to help countries assess their IT and ITES industries. Finally, appendix B presents an analysis of the IT and ITES industries in Indonesia and Kenya as an illustrative application of the LRI.

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.

IT-Based Services: Global Outlook

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 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 may not accurately isolate IT services and ITES. As a result, much of the data on the size of the current market come from private surveys, consulting firms, and anecdotal evidence. According to McKinsey estimates, the annual addressable market for IT services and ITES was \$475 billion in 2007 (see figure 1) and about \$500 billion in 2008. Less than 20 percent of that market, however, was being exploited in 2008.

Among the various segments of IT application services, the greatest opportunities lie 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).

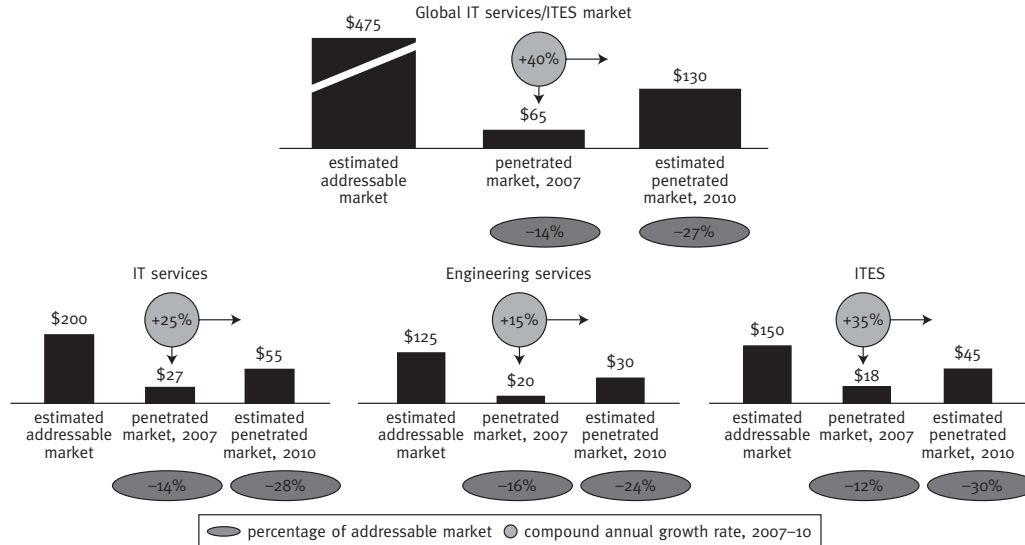
Table 1 A Typology of IT Services and ITES

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

Source: Adapted from BPAP 2007.

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

Figure 1 Global Opportunities for IT Services and ITES
US\$ billions



Source: Computed from McKinsey & Company 2008 consultancy inputs.

Note: According to NASSCOM (2009), the addressable market for global sourcing of IT services and ITES was \$500 billion in 2008. The broken first bar reflects the fact that it is not drawn to scale.

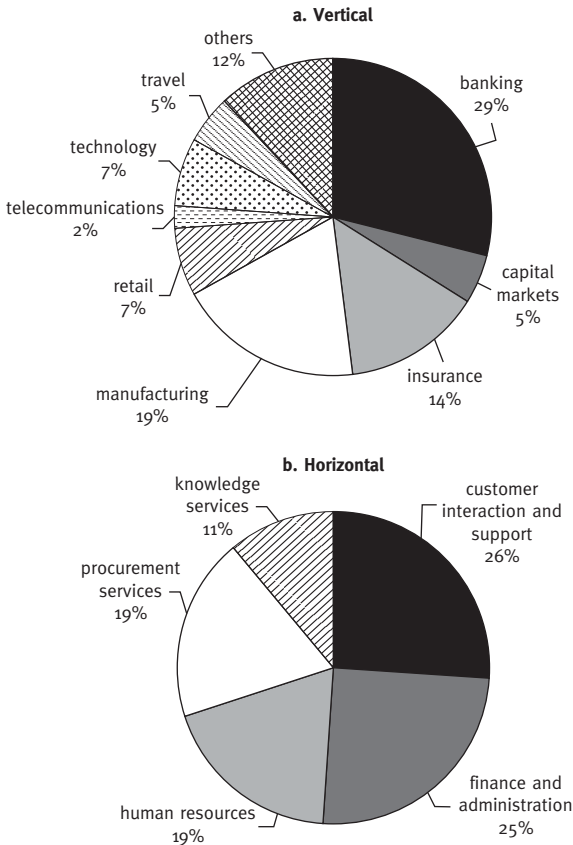
Estimates of the market size of ITES vary significantly. According to Gartner Research (2008a), the global market is expected to grow from \$171 billion in 2008 to \$239 billion in 2011. But estimates by the National Association of Software and Services Companies (NASSCOM-Everest 2008) are more than three times higher, 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 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. According to NASSCOM, though the global financial crisis was expected to have resulted in reduced technology-related spending for the first two to three quarters of 2009, spending is expected to pick up in 2010, and “greater focus on cost and operational efficiencies in the recessionary environment is expected to enhance global sourcing” (NASSCOM 2009, 1). The limiting factor appears to be on the supply side. Countries that meet the requirements of the untapped market are likely to experience rapid growth in these industries.

Economic Impacts of Developing IT and ITES Industries

India is the global leader in the provision of both IT services and ITES (figure 3). Two developed countries—Canada and Ireland—have also done particularly well in the industry, 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 the Russian Federation) 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 industry has created jobs, raised incomes, and increased exports and GDP.

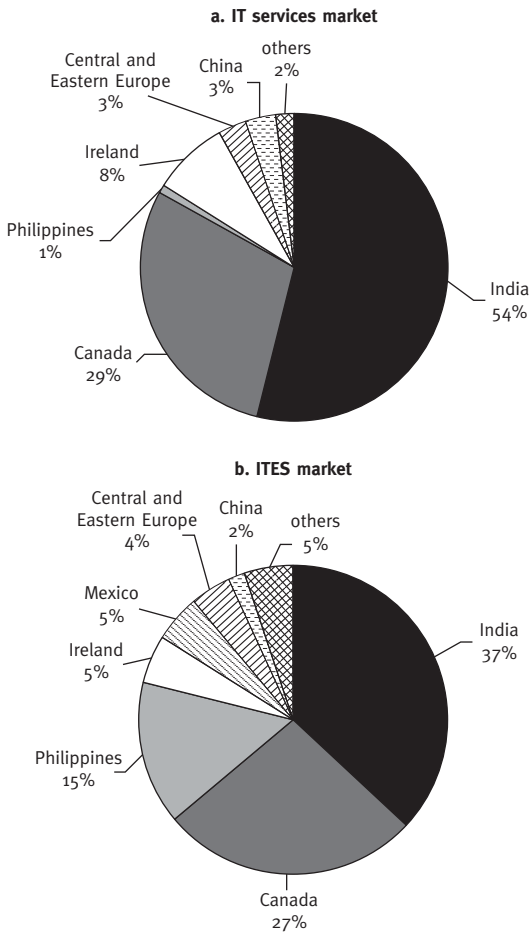
Figure 2 India's Addressable Market for Vertical and Horizontal ITES Functions



Source: NASSCOM-Everest 2008.

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 other ITES). Exports increased to \$47.3 billion in 2008–09 (NASSCOM 2010). The IT services and ITES industries contributed

Figure 3 Global Distribution of Offshore IT Services and ITES Markets



Source: McKinsey & Company 2008 consultancy inputs; NASSCOM-Everest 2008; Tholons 2006.

one-quarter of the country's total exports and 45.5 percent of service exports in 2008–09 (Ministry of Finance 2010). In addition to the exports, some \$12.6 billion of software services were also produced for domestic consumption. India's IT services and ITES exports are

forecast to reach \$50.1 billion in 2010, when the sector is expected to represent 6.1 percent of GDP (NASSCOM 2010).

A study on the output linkages of India's IT services and ITES sector 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).⁴ More recently, NASSCOM has estimated that the downstream effects of operating and capital expenditures of the IT services and ITES sector in India contributed \$30 billion to the economy in 2009, while the consumer spending of employees engaged in the sector contributed another \$21 billion (NASSCOM 2010).

The IT services and ITES industries have an important impact on the labor market in India. The industry directly employs nearly 2.3 million people in jobs that pay 50 to 100 percent more than comparable service sector jobs. In addition, the sector creates indirect employment opportunities in industries such as construction, retail, transport,⁵ 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).⁶ 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). NASSCOM has estimated that by 2010, the IT services and ITES industries in India will have created 8.2 million indirect jobs (NASSCOM 2010).

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 reached \$7.3 billion in 2009, up from \$100 million in 2001.⁷ As of 2009, the industry employed 442,000

people, up from 4,000 in 2001. 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 Business Processing Association of the Philippines (BPAP) projects that it is possible for the IT services and ITES industries in the Philippines to continue its rapid growth, doubling its share of the global market from 5 percent in 2006 to 10 percent and producing revenues of about \$13 billion and direct employment for close to 1 million people by the end of 2010 (BPAP 2007). Employment on 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 for each new job created in IT services and ITES in the Philippines, some two to three new jobs were created in other sectors. An increase in direct employment of 600,000 people over the period 2006 to 2010 would therefore create 1.2 million–1.8 million additional new jobs indirectly as employees purchase 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 the Philippines' 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 in recent years. Until the late 1980s, Ireland was one of the poorest countries 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 Ireland's 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, approximately

50 call centers employed 6,000 people, twice as many as the original plan (Barry and van Welsum 2005). Recognizing the importance of employment-intensive services foreign direct investment (FDI), the IDA has included this among the 10 initiatives that it will focus on as part of its “Horizon 2020” strategy (IDA 2010).

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. As a result of the establishment of the International Financial Services Center (IFSC) in 1987, almost 450 international financial institutions now 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 (EIU 2008). Financial services companies employ 16,000 people and pay an estimated 15 percent of all corporate taxes in Ireland.

Other Impacts: Social Benefits Policy Reforms and Country Brand

Success in the IT services and ITES sector engenders a number of positive impacts other than employment and contribution to GDP. 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 the 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 that 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 account for a greater number of high-paying jobs than in most other sectors of the economy.

Development of the IT services and ITES sector can also 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 reforms are enacted in 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, Tata Consultancy Services (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 their 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).

Country Competitiveness in the Global Market of IT-Based Services

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 location. In recent years, a number of consulting firms have developed benchmarking frameworks, locational indexes, and rating criteria for determining the e-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 2 provides a more detailed list of factors in each of these categories.

Table 2 Frameworks for Assessment of Locations for IT Services and ITES

A.T. Kearney's Global Services Location Index	Gartner's 10 criteria	Hewitt's International Benchmarking Model	McKinsey's Locational Readiness Index
People and skills availability <ul style="list-style-type: none"> ■ Remote service sector experience and quality ratings ■ Labor force availability ■ Education and language ■ Attrition risk 	e-Infrastructure <ul style="list-style-type: none"> ■ Power ■ Telecommunications ■ Transport 	Infrastructure <ul style="list-style-type: none"> ■ Real estate ■ Telecom ■ Power 	Quality of infrastructure <ul style="list-style-type: none"> ■ Telecommunications / IT ■ Real estate ■ Transportation ■ Power
Financial attractiveness <ul style="list-style-type: none"> ■ Compensation costs ■ Infrastructure costs ■ Tax and regulatory costs 	Labor pool <ul style="list-style-type: none"> ■ Quality ■ Quantity ■ Scalability ■ Work conditions 	Connectivity <ul style="list-style-type: none"> ■ Availability ■ Quality ■ Cost 	Talent <ul style="list-style-type: none"> ■ Availability ■ Suitability ■ Willingness ■ Accessibility ■ Trainability
Business environment <ul style="list-style-type: none"> ■ Country environment ■ Infrastructure ■ Cultural exposure ■ Security of intellectual property 	Educational system <ul style="list-style-type: none"> ■ Quality ■ Number of institutions ■ New grads in IT 	Talent <ul style="list-style-type: none"> ■ General demographics ■ Environment ■ Macroeconomic ■ Business environment ■ Geopolitical environment 	Cost <ul style="list-style-type: none"> ■ Labor cost ■ Infrastructure cost ■ Corporate tax
	Cost <ul style="list-style-type: none"> ■ Labor ■ Real estate ■ Infrastructure ■ Telecom 	Clusters <ul style="list-style-type: none"> ■ Incumbent IT and ITES industries 	Market maturity <ul style="list-style-type: none"> ■ IT/ITES employees as percentage of total service sector employment

Political and economic environment

- Stability of government
- Corruption
- Geopolitical risks
- Financial stability

Language

Government support

- Promotional
- Institutional
- Education

Cultural compatibility

- Cultural attributes
- Adaptability
- Proximity
- Ease of travel

Global and legal maturity

Data and intellectual property security
and privacy

- IT/ITES as percentage of services GDP
- Presence of industry association

Risk profile

- Regulatory
- Country investment
- Data protection

Other incentives

Environment

- Government support
- Business and living environment
- Accessibility

Source: Authors' summary.

Talent pool. Together with the existence of competitive telecommunication markets, especially for broadband services, the availability of employee skills is the single most important factor in the growth of the IT services and ITES sector. In fact, the growth of the industry has created a situation in which skills scarcity creates opportunities for countries new to the industry 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 and ITES industries (McKinsey Global Institute 2005), is likely to have a talent shortfall of 0.8 million–1.2 million skilled workers 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 less than 100 non-Indians.

An 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* assesses whether graduates meet a certain quality standard for work in the industry and have the necessary language (not necessarily English) skills. In a study conducted by the McKinsey Global Institute, examination 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 skills) for being employed in the sector (Farrell 2007). Educational content is often poorly aligned with industry needs.
- *Willingness to work in the industry* is a function of both the stature of the industry and other job options available.
- *Accessibility* is potential staff's proximity to a proposed IT/ITES site or their willingness to relocate.
- *Trainability* measures the currently unsuitable cohort's potential to become 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 sufficiently large and growing such that firms are able to 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 3 presents an illustrative example of the share of different cost components for IT services and ITES businesses, and suggests

Table 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.

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 both 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 seek information on tax treaties and their effects on tax rates (Sutherland Global Services 2008).

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/ITES sector and demonstrate the level of government commitment to nurturing a conducive business environment for the industry.

Infrastructure. Infrastructure considerations include the 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 multiple international cables linking the location to competitive global communication networks.

In countries with unreliable public infrastructure, companies look for the ability to self-provide services or, alternatively, 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 accommodations 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—factors such as government policies toward 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 where to invest. Many of these factors can be more easily controlled by focusing on a specific sector, such as 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, or APIInvest as of 2005) in Andhra Pradesh, 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 is strengthened more slowly.

The living environment—availability of healthcare facilities, international schools and other high-quality academic institutions, entertainment facilities, civic infrastructure, public safety, and hygiene—also influences companies’ decisions about where to locate.

Country risk relates to stability and transparency of law, macroeconomic stability, treatment of foreign capital, and data and intellectual property law protection, to name but a few. Potential investors weigh these risks according to their own history and the risk-taking profile of their management. Companies, meanwhile, make decisions on 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 indexes and tools used by industry analysts and consulting firms (such as the ones summarized in table 2) that are active in the IT services and ITES industries.

Location Readiness Index

A Location Readiness Index (LRI) was developed as a modeling tool by McKinsey & Company for the World Bank and *infoDev* to help countries identify their areas of relative strengths and weaknesses in terms of IT and ITES, and thus direct their efforts to interventions that will have the greatest impact on their likelihood of success. The LRI is a diagnostic tool that measures a country's⁹ strengths and weaknesses in six important categories: talent pool size and quality; cost; quality of infrastructure; environment; risk profile; and market maturity. The details of the LRI are presented in appendix A of this book and the results of the LRI as applied to Kenya and Indonesia are presented in appendix B.

The 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, 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 book, several other small countries 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 10,500 people in IT services and ITES in 2009, 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 a number of leading global suppliers (for example, Accenture, Ceridian, and Hinduja Global Solutions) and offshore captives (for example, Orange, DHL, and Huawei). Some of the local suppliers, such as Rogers, Infinity BPO, and Euro CRM, have also built a credible presence (Everest 2009). While Mauritius has a good mix of voice and non-voice ITES services, it has begun transitioning to higher value added activities such as advisory, design, and legal (MBOI [Mauritius Board of Investments] 2007). As another indication of Mauritius’s

success, A.T. Kearney (2009) ranked the country 25th among the top 50 destination countries for IT services and ITES worldwide. Mauritius was ranked ahead of other countries in Africa, including Senegal and Morocco, in spite of its smaller size, higher costs, and direct competition in the francophone market.

Malta. With an area of 316 square kilometers and a population of 0.4 million, Malta is an even smaller country than Mauritius. Yet the World Economic Forum's *Global Information Technology Report 2008–2009* ranks Malta second, after Singapore, in terms of government success in promoting 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 [Interoperable Delivery of European eGovernment Services to Public Administrations, Business and Citizens] 2008). The country has successfully attracted specialized software firms such as Crimsonwing, Uniblu, 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 an estimated 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. Within an area of 360,000 square meters, SmartCity Malta will offer 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 [Organisation of Asia-Pacific News Agencies] 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

address 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 exploiting membership in a customs union and proximity to a large market, 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 industry represents 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 sector may contribute just as much to other, smaller economies.

The percentage of the population of Mauritius employed in the IT services and ITES industries, for example, was about four times as high as that of India in 2009. 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, and emphasize 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 (a) countries that have succeeded have generally seen their governments making deliberate interventions to catalyze growth of the sector; (b) 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 (c) 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. Though 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, for example, 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 were 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 also 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 services and ITES companies that agreed to 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 sector 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. In turn, all of these investments contribute to improving the broader business environment. While a less targeted approach may not prioritize these actions in the timeline demanded by the industry, 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 IT and ITES 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. Ideally, the institutional structures for promoting IT services and ITES should include a level of government involvement 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 30 percent of GDP, two-thirds of all exports, and nearly half of all corporate tax revenues (IDA 2010). 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, 10). Eight of IDA’s 12 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, India. 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 had grown to more than \$7 billion by 2009 (*The Hindu* 2010).

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 facility¹⁰ 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 to its success in 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 (in the United States) 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 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).

In all countries seeking to attract strategic anchor investors in order to gain a critical mass of investors in the IT services and ITES industries, the government must be proactive. 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 convincing 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 earlier, 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 industry is in our view the most important factor for success. In this regard, the government of Mexico established a new organization in 2008, MexicoFIRST, as a partnership between the Asociación Mexicana de la Industria de Tecnologías de Información (AMITI) and the Asociación Nacional de Instituciones de Educación en Tecnologías de la Información (ANIEI). ProSoft, a government agency tasked with promoting the IT services and ITES industries, facilitated and supported the creation of this entity. MexicoFIRST will closely interface with the industry on the one hand, and with Mexican universities on the other, to facilitate training programs at the universities to meet industry 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 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 provides 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 IT services and ITES 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, for example, 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 of 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

Table 4 NASSCOM ITES 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.

directed the Technical Education and Skills Development Authority (TESDA) to allocate 350 million pesos (approximately \$8 million) to provide scholarships for training 70,000 call center agents (TESDA 2008). In addition, 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 [Singapore Economic Development Board] 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, 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. Given the need to address the shortage of skills, a number of IT services and ITES companies are collaborating with academic institutions. Examples in India (Wadhwa, de Vitton, and Gereffi 2008) include the following:

- 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 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
- 24/7's partnership with 200 colleges and even with high schools to prepare students for the BPO industry.

In addition to the efforts of IT services and ITES companies 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. Those initiatives have been designed to expand existing university infrastructure and faculty, develop competencies that are benchmarked globally, and forge linkages for skills development with private sector and best-in-class institutions (see box 1).

Box 1 Government and University Initiatives in Skills Development for IT Services and ITES

Public funding initiatives. **Ireland** presents several good examples of publicly funded initiatives to expand existing infrastructure, faculty, and IT curriculums at universities, colleges, and schools in order to expand the IT talent pool. By end-2001, Ireland had invested IR£40 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, while 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 curriculums 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

Box 1 continued

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 Singapore Economic Development Board (SEDB) too 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 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. Established in 1989, the PSDC has a membership of 141 companies and is led by the private sector.^a The Chittagong Skills Development Centre, in **Bangladesh**, is a similar public-private partnership focused on skills development for the ICT, manufacturing, and services sectors.^b That 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** has undertaken yet another interesting example of proactive promotion

(continued)

Box 1 continued

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. Recently, there has been a move to transition these schools into partnerships focusing on high-end research. 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. Visit the PSDC's Web site, <http://www.psd.com.my>, for more information.
- b. Visit the Centre's Web site, <http://www.csd.com.bd>, for more information.

Partnerships with leading standards organizations, industry associations, universities, and companies can also 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 offshore 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 University'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 (PMP) 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 have the potential to be addressed, such as minimum wage laws, severance requirements, restrictions on women working, or restrictions on nighttime work. The government of the state of Goa in India, for example, exempted the IT industry from application of the Minimum Wages Act of 1948 because wages in the industry are much higher than minimum wage and because IT companies were averse to being subjected to frequent inspections, rent seeking, and bureaucratic requirements for compliance with the act.

This volume 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 during the period in which firms might have invested without the subsidy, and are difficult to withdraw once given. 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.¹¹ 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 broadband networks in commercially unattractive areas; such partnerships have been used for underserved areas in India, Malaysia, Spain, Uganda, and elsewhere.¹²

Korea is a well-known leader in broadband, as a result of its policies that include full liberalization of the telecommunications market; unbundling of the local loop; leveraging of private investment for rapid rollout 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 certain niches of the IT industry, such as online gaming, where Korean companies are the biggest global players. In February 2009, Korea announced that it was upgrading its network to boost broadband speeds for citizens to 1 gigabit per second by 2012.

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 known as 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. As of 2008, the MSC had generated 63,000 knowledge-based jobs and more than RM 13 billion (approximately \$4 billion) in revenues (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 hoped to create 10,000 jobs by establishing a BPO technology park, and allocated a budget of K Sh 900 million (approximately \$13 million) for financing the initial part of the project (Minister of Finance 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.

Competitive incentive packages including items such as subsidies on the costs of telecommunications (such as in Kenya) and other utilities (such as in the state of Orissa in India) are often offered for companies to locate to these parks. 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 still exists in many countries.

The bureaucratic burden may be decreased by removing some licensing requirements and providing expedited approvals for qualifying companies on remaining requirements. Industrial licensing, for example, was abolished in India's 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 certify their own 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 Malaysia's Communications & Multimedia Act. Malaysia's Digital Signature Act and Computer Crimes Act, Singapore's Computer Misuse Act and Electronic Transaction Act enacted in 1998, and the Protection of Information Infrastructure Act 2001 in Korea 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, and Malaysia, and Singapore have done, or the World Intellectual Property Organization (WIPO) Copyright Treaty, onto which China, Korea, Peru, Senegal, and Singapore (to name but a few) have signed. Raising awareness about these issues in the legal community and among police, prosecutors, and judges is also key.

Another policy option is making the movement of capital more free and avoiding imposing double taxation 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.

Conclusion

The global market for IT services and ITES is large and growing despite fears of a temporary setback because of the global financial crisis. Limitations to growth are mostly on the supply side, particularly in terms of employees with skill sets that meet the requirements of the market. The globalizing market for skills, however, allows developing countries to exploit 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 niches 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.

In countries that have succeeded in the IT services and ITES industries, governments have generally adopted a proactive role in promoting the sector. Such support can often be provided with relatively low levels of public funding by leveraging private sector investments. Most of the public interventions to promote the industries—such as improving education, providing broadband infrastructure, and streamlining government interfaces with businesses—are moves that carry little risk.

Countries that have successfully developed IT services and ITES industries 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 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. This book provides a discussion of available policy options.

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.

Appendix A: The Location Readiness Index as a Diagnostic Tool

The Location Readiness Index (LRI) was developed by McKinsey & Company for the World Bank and *infoDev*. It is a modeling tool that helps countries identify their areas of relative strengths and weaknesses in terms of information technology (IT) and IT-enabled services (ITES) and thus direct their efforts to interventions that will have the greatest impact on their likelihood for success in the sector.

The output of the LRI model can help a country determine whether it might be immediately competitive in the offshore IT/ITES market. The primary data collection for the LRI model also yields valuable insights into what, if anything, needs to be addressed to improve a country's competitive position. The model can be downloaded in Microsoft Excel format from the World Bank's Global Information and Communication Technology (GICT) Department Web site: <http://www.worldbank.org/gict/publications>.

Dimensions of the LRI: What Is Needed to Be Competitive?

As mentioned in the first part of this book, favorable costs, good human resources, and a functional business environment are needed to attract

Significant contributions to this appendix were received from Sandra V. Sargent (operations officer) and Siou Chew Kuek (consultant) of the World Bank.

IT/ITES investment. Countries seeking to compete in the offshore IT/ITES market should imagine themselves in the place of private sector companies and understand, first, what motivates companies to source services globally and, second, why a company would prefer a particular location over another. The main driver of the former is generally cost: companies that move services offshore or source them from a lower cost transnational location generally do so in order to take advantage of cost arbitrage. Increasingly, though, quality is becoming a key driver, sometimes overriding cost considerations. More conventionally, once the cost criteria have been met, quality of the local talent pool and a host of “doing business” and infrastructure factors come into play. The quality of the local talent pool gives managers confidence that they will be able to hire workers with the right skill sets without difficulty. The other factors reassure managers that they will encounter neither unreasonable barriers nor unnecessary aggravation in running their businesses. Several of these drivers are discussed below.

Talent Pool

The talent pool assessment in the LRI begins with the annual number of university graduates in each of several subjects that are of interest to IT/ITES firms. Generalists, business specialists, engineers, and those with other technical specialties are typically of interest to the industry. This number is then whittled down to understand how many of these graduates are (a) suitable for employment (that is, they meet a minimum standard of quality for working in the offshore industry and have the necessary technical and language skills), (b) willing to work in this industry (this is a function of both the standing of the industry and of other job options available), (c) accessible (that is, they live in close proximity to a proposed offshoring site or are willing to move there), and (d) trainable (that is, of the nonsuitable cohort, how many can, with a short training course, move to the suitable category).

Calculations are also carried out separately for each of the four standard IT/ITES business lines: data processing, voice processing, knowledge services, and IT services. The IT services segment includes both IT services and research and development (R&D) services, while

the other three business lines are in fact IT-enabled services. Each business line has its own requirements for employees. The analysis begins with the number of university graduates who are potential employees within each business line and analyzes the quality of the graduate pool and relative attractiveness of the industry compared to other destinations to arrive at the number of graduates suitable, willing, accessible, and trainable for IT/ITES work.

Cost

The cost index calculation of the LRI is made up of two main components. The first component, “hourly cost of doing business,” takes into account the hourly cost per full time worker doing a particular job (the output of each such person is a “full-time equivalent,” or FTE) needed to keep an IT/ITES business running. This indicator reflects the various staffing levels and requirements of the four business lines described above and takes into account facilities, telecom, broadband (as part of the telecommunications costs) and selling, general, and administrative (SG&A) costs.

The second component of the cost index calculation measures the financial incentives—usually fiscal—offered to companies to decrease costs and, hence, make a local IT/ITES investment more compelling.

Infrastructure

Infrastructure is included in the LRI model by analyzing the availability, quality, and reliability of (a) telecommunications, (b) real estate, (c) the power supply, and (d) transportation (road and rail). Each of these is given a 25 percent weighting in the calculation of the infrastructure component.

Business and Living Environment

The business and living environment component of the LRI includes four parts, each of which is given a 25 percent weighting in calculating

the score for this component: (a) general government support of business (including bureaucratic burden and corruption), (b) the overall business environment (including a number of World Bank “doing business” indicators), (c) quality of life (including desirability of location, disease burden, and crime), and (d) accessibility to the main markets where services are expected to be delivered (including flight time and frequency of flights).

Country Risk

The country risk component of the LRI model measures three areas: (a) the transparency, stability, and predictability of a country’s regulatory environment (regulatory risk); (b) a country’s macroeconomic and currency stability and capital freedom (country investment risk); and (c) the adequacy of a country’s intellectual property and data protection (data risk). In general, the model weighs each of these areas equally. Depending on the business line or type of investors a country targets, however, the parameters may be weighted differently in order to more accurately reflect the relevant business priorities, (for example, by increasing the relevance of data risk for businesses that depend on patent integrity or data security). The model does not measure severe disruptions such as civil wars and domestic strife. This was intentionally omitted from the model since events of this magnitude present another “gating” (go/no-go) function rather than being part of a nuanced calculation of risk.¹³

Industry Maturity

Industry maturity describes how well developed the country’s IT and ITES industries already are, how much IT/ITES business is being done, and whether there is an active business association to coordinate private and public sector activity and to promote the industry to investors. While first movers have certain advantages in entering new markets, they also undertake a number of risks. However, coming into a market just as it is becoming saturated also carries with it the risk of higher costs, less available infrastructure, and an overall decrease in the quality of services (that is, diseconomies of scale). Between these

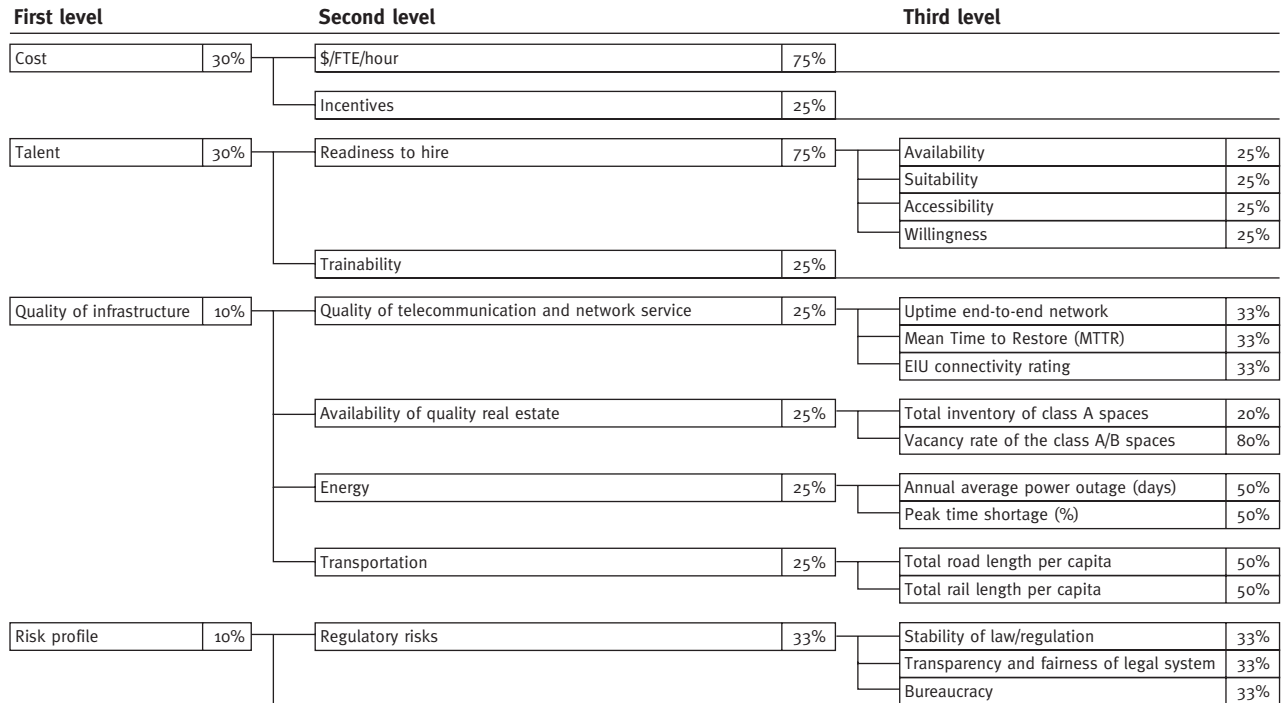
two points, there is a growing ease of doing business that is associated with a declining risk.

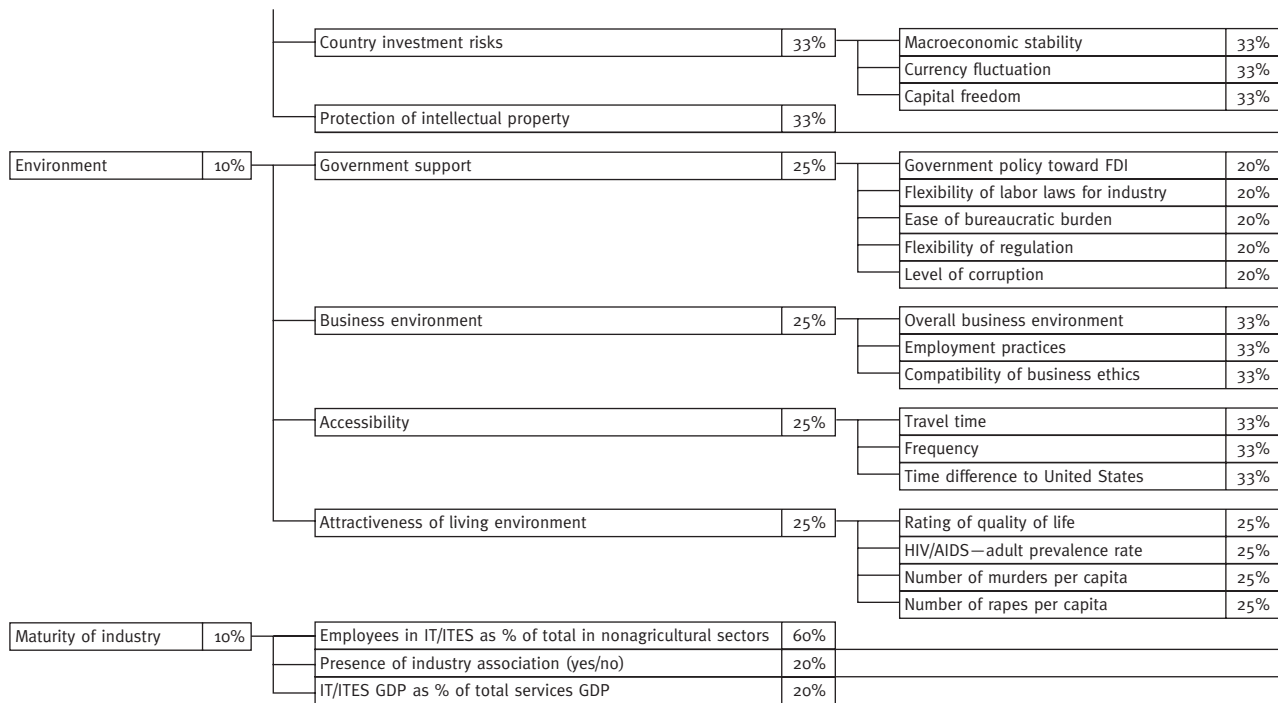
The industry maturity component of the LRI measures three factors: (a) the contribution of IT/ITES to gross domestic product (GDP), (b) the percentage of service sector jobs in IT/ITES, and (c) the existence of an industry association. Industry maturity is therefore predominantly a second-order metric: of the six dimensions of the LRI, it improves most with successful action on the other five. Figure A.1 lists the LRI criteria and subcriteria.

The data needed to make up the LRI are typically collected from a combination of primary and secondary sources. Data collection in less developed countries, where data are not typically published by commercial sources or by international organizations, requires heavier dependence on primary sources, such as interviews with stakeholders. Data are indexed on a scale of one to five (one being the most attractive), weighted, and included in one of the six model categories. Each of the six categories yields a score on a scale of one to five, with one being the best score (indicating that the country is very competitive on that criteria) and five the worst score (indicating that the country likely needs to make a significant commitment to improvements in several areas to be competitive in IT/ITES). The six categories are then themselves weighted and averaged into a single LRI score. Figure A.2 provides guidance on how scores should be interpreted.

An additional feature of the model allows the different categories, criteria, and subcriteria that go into each component to be weighted according to the requirements of a particular company or sector. For example, a country that believes it has a reasonable prospect of providing banking- or defense-related engineering services may wish to give more weight to data protection and security than to cost considerations in the model, as this more closely approximates how potential customers or investors view the country. In short, from a country's perspective, the possibility of assigning differing weights to different criteria is important because that approach allows the country to assess its competitiveness with respect to the particular segment or segments in which it hopes to compete.

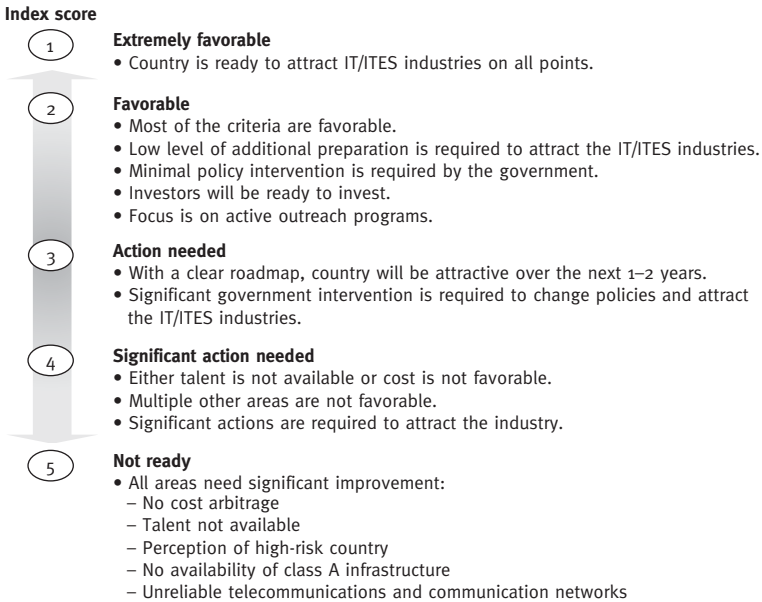
Figure A.1 Main Dimensions and Components of the LRI





Source: McKinsey & Company 2008 consultancy inputs.

Note: EIU = Economist Intelligence Unit; FDI = foreign direct investment; FTE = full-time equivalent; IT = information technology; ITES = IT-enabled services.

Figure A.2 Interpreting the LRI Index Scores

Source: McKinsey & Company 2008 consultancy inputs.

Most important, the model permits countries to assess their competitiveness in four different areas of IT/ITES. As discussed above, IT/ITES is actually a complex and varied set of businesses—IT, R&D, and business process outsourcing (BPO)—each of which require different inputs and produce outputs of different value. Countries and companies therefore need to know which of these components can be supported locally in a low-cost country and which cannot. Generally, complexity tends to increase along the continuum of services, starting with data processing, which is the least complex, and progressing to voice processing, knowledge services, and IT, which tend to be more complex.

Segmentation within the LRI model is primarily based on the different talent and cost considerations that go into each of the four business lines and is driven by the fact that these four business lines represent

different value propositions to providers. Put differently, whether a multinational company is starting a back office function, a call center, a remote radiology room, or a software development affiliate in a developing country, it will probably see the same infrastructure, environment, country risk, and local business maturity. But starting a software development operation requires expensive engineers, and starting a radiology services company requires trained and licensed radiologists, while data processing might only require inexpensive trade school or other graduates. From a country perspective, it is therefore essential to be able to identify what talent is available, what business lines can be supported, and what it will cost companies to hire.

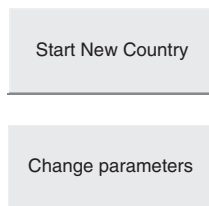
The LRI Model

Developed in Microsoft Excel, the LRI model stores the data required to calculate the LRI for a new country, calculates the index for each of the dimensions and each of the countries, and allows for immediate comparison among the countries analyzed as part of this study. Figure A.3 shows the start screen, which offers two options: (a) start the calculation for a new country, or (b) change the parameters.

If the “start new country” button is pressed, a new dialog box appears with different options for introducing the required information. Data

Figure A.3 LRI Model: Start Screen

Location Readiness Index - LRI



Source: McKinsey & Company 2008 consultancy inputs.

requirements are grouped in three categories: primary data, secondary data, and index data. The “change parameters” option allows the user to modify the relative weights of the different variables. Even though the weights assigned by default reflect the relative importance given by the demand, the analysis of specific segments in the IT/ITES space may require a shift in the relative weights.

In the case of the LRI model, primary data is most likely collected from in-depth interviews with practitioners and government authorities. Figure A.4 shows the dialog box for primary data. Buttons at the left of each variable provide a brief description and, where appropriate, ranges for index data and examples of values for other countries.

Information on human resources, availability of talent pool, and FTE cost (metrics known as categories) is collected for each of the four segments (data processing, voice processing, knowledge services, and IT services) in the LRI model, as each segment requires different

Figure A.4 LRI Model: Primary Data Dialog Box

Primary Data

Country Name:

Help	Generalists Data	Generalists Voice	Knowledge Process	IT Services
<input type="checkbox"/> Fully Loaded Cost FTE (USD / hr.)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Availability	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="checkbox"/> Suitability (%)	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %
<input type="checkbox"/> Accessibility (%)	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %
<input type="checkbox"/> Willingness (%)	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %
<input type="checkbox"/> Trainability (%)	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %

Employees in IT/ITES as % of total employees in non agriculture %

IT/ITES GDP as % of total services GDP %

Incentives (tax, infrastructure support - e.g. software parks, etc.)

Presence of Industry association? True False

Accept Next

Source: McKinsey & Company 2008 consultancy inputs.

skills. Additionally, several filters are applied to the overall number of graduates from relevant professions. Full descriptions of each of the categories are as follows:

Fully Loaded Cost FTE is the fully loaded cost in US\$ per hour for FTE position in each of the four segments. Cost varies according to the profile and skills required for each of the segments (for example, engineering versus analyst positions), and the amount of supervision and support required (data processing, for example, might have a cheaper quality control structure than a software programming endeavor). Appendix B contains further discussion of this.

Availability is the gross number of graduates available for each segment—for example, engineers for the IT services segment or graduates in administration for the knowledge process segment. In general, potential employees for the data services and voice services segments come from the same pool of graduates, with the difference between the two segments being fluency in the language in the destination country.

Suitability is the percentage of the graduates who would be able to meet the challenges required to work in each of the different segments.

Accessibility is the percentage of graduates who are suitable for work in each of the four segments and live close to an “outsourcing hub” or are willing to move to one.

Willingness is the percentage of graduates who are suitable and accessible that would be willing to work in the IT and ITES industries.¹⁴

Trainability is the percentage of available graduates who are currently not suitable but could become suitable provided some training, defined as a maximum six-month period of full-time training sessions.

Employees in IT/ITES as a percentage of the nonagricultural labor force and IT/ITES GDP as a percentage of total services GDP are variables that allow a better understanding of the size of the sector.

Incentives rate the incentives that the government of the country being examined offers to the IT and ITES industries, including (but not limited to) tax exemptions and infrastructure support through IT parks. Incentives are entered into the LRI model according to an index (1= very attractive; 5 = nonexisting incentives).

The secondary data dialog box, as shown in figure A.5, requires information usually available from government entities or industry associations, while the index data dialog box requires information available from international organizations and private institutions (for example, the World Bank and the International Telecommunications Union). For all variables in both of these dialog boxes, examples from other countries and recommended sources are provided. Once all the information for a country is entered into the model, the index is calculated.

Though the LRI can lead to important insights about a country, particularly in identifying areas that require additional attention in order to improve its attractiveness as an offshore (see the Chittagong Skills Development Centre's Web site, <http://www.csdc.com.bd>), IT/ITES destination, the LRI should not be a stand-alone exercise. Rather, it should be part of a larger diagnostic process of a country's IT and ITES sectors. This topic is discussed further in appendix B.

Applying the LRI Model to the United States, India, Indonesia, and Kenya

The LRI model was initially applied to the United States and India, both to validate model output results and to use these countries' results as benchmarks. The model was then applied to the two case study countries, Indonesia and Kenya. The overall results of the analysis are described in appendix B. As expected, comparing the results of the model for India and the United States shows a distinct overall cost advantage for India together with advantages in the talent pool, although the United States scores higher than India on all other factors. Except for the talent pool issue, these results would probably be accepted by any casual observer not familiar with the world of IT/ITES offshoring: India is the lower-cost provider, while the United States

Figure A.5 LRI Model: Secondary and Index Data Dialog Boxes

Secondary Data

Location Readiness Index

Help

- Uptime of end-to-end network (%) %
- Mean Time to Restore (MTTR) - Hours
- Total inventory of class A spaces (in squared feet)
- Vacancy rate of the class A/B spaces (%) %
- Annual average power outage days
- Peak time shortage (%) %
- Total road length/per capita (in km.)
- Total rail length/per capita
- Travel time to target destinations (in minutes)
- Frequency (non-stops flights / day to target destination)
- Time difference to target destinations (in hours)
- HIV/ AIDS-adult prevalence rates %
- Number of murders per capita
- Number of rapes per capita

Index Data

Location Readiness Index

Help

- EIU connectivity rating
- Stability of law/regulation
- Transparency & fairness of legal system
- Bureaucracy
- Macroeconomic stability
- Currency fluctuation
- Capital freedom
- Protection of intellectual property
- National government policy towards foreign investment
- Flexibility of labour laws for industry
- Ease of bureaucratic burden
- Duration (days) to start a business
- Level of corruption
- Rating of overall business environment
- Employment practices
- Compatibility of business ethics/culture with target destinations
- Rating of quality of life

Source: McKinsey & Company 2008 consultancy inputs.

provides better facilities. Another important observation in comparing India and the United States is that though the two countries score differently on the various parameters, their overall scores on data and voice processing are very close. However, that does not necessarily imply that they are equally attractive to investors, as their profiles are so different that investors would choose them for very different reasons: cost-sensitive investors would be more likely to choose India, while risk-averse investors would be more likely to locate or retain services in the United States.

Indonesia and Kenya return similar LRI summary scores. Neither country appears *prima facie* to be a particularly attractive offshore destination when compared to India, which enjoys low costs and a large ready-to-hire talent pool. The conclusion from the overall score for these countries might well be that neither currently enjoys a particular competitive advantage and that it will require a significant commitment of political will, financial resources, and time to build one. However, closer examination of individual category scores and of the category subcriteria reveal several subtle but important differences between the two countries, with differing consequences for each: Indonesia has a large labor pool that would allow a nascent offshore sector room to grow, while Kenya is more talent and population constrained and may need to consider other, less traditional approaches to building a successful offshore sector. Indonesia appears not to have focused on the offshore opportunity and so has not grown the sector. Kenya, however, has tried to develop the sector but, in part because of its talent constraints, has had limited success. Appendix B offers a detailed description of the results for these countries.

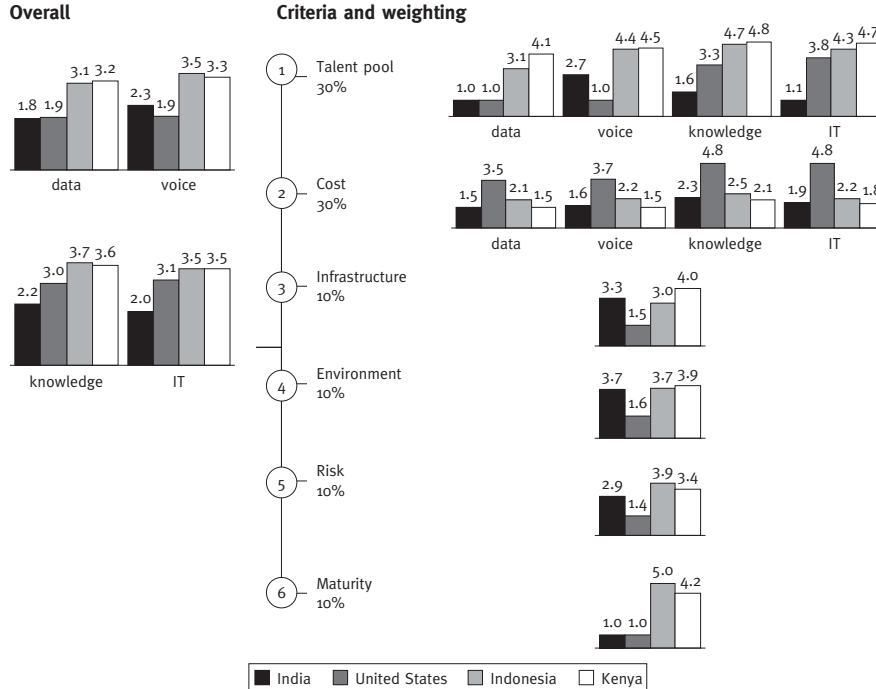
Appendix B: Application of the Location Readiness Index to Indonesia and Kenya

Indonesia and Kenya were analyzed as an illustrative application of the Location Readiness Index (LRI). It was found that both countries need investment and good policies in order to make themselves hospitable environments for offshore information technology (IT) and IT-enabled services (ITES) activity. Presentations with more detailed analysis for the two countries are available on the World Bank's Global Information and Communication Technology (GICT) Department Web site: <http://www.worldbank.org/gict/publications>.

At first glance, neither Indonesia nor Kenya appears to be a particularly attractive offshore destination when compared to India, which offers low costs and a large ready-to-hire talent pool. Scores for Indonesia and Kenya on each of the six dimensions of the LRI are shown in figure B.1, alongside scores for India and the United States.

The overall LRI score for both Indonesia and Kenya seems to confirm the initial assessment that they have higher scores than India (that is, they are less attractive locations for IT services and ITES companies). However, the LRI can also be seen as a diagnostic tool that provides further insights to policy makers and allows them to identify areas for improvement. The latter can be seen through detailed assessments of each of the dimensions.

Figure B.1 Indonesia and Kenya Compared with India and the United States



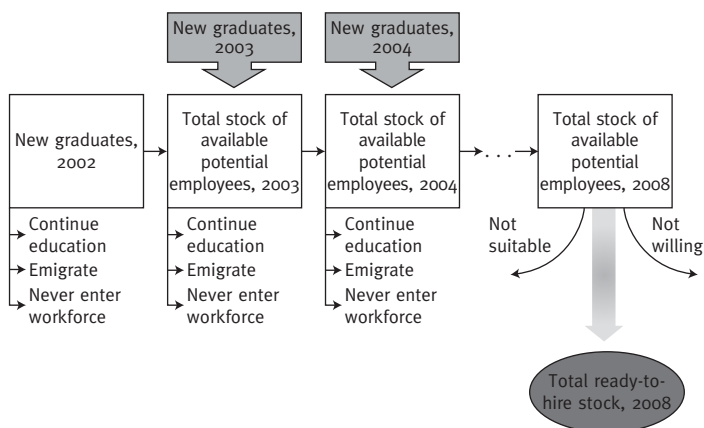
Source: McKinsey & Company 2008 consultancy inputs.

Talent Pool

In evaluating a country's IT/ITES talent pool, a ready-to-hire population is calculated. This population is defined as the number of new graduates who could immediately be hired should an investor place an IT/ITES facility in the country, plus graduates from previous years who could become available either because they are unemployed or willing to switch jobs to enter the IT/ITES workforce. The number of graduates available would be net of those who are continuing their education, have emigrated, or never entered the workforce. The ready-to-hire population also excludes graduates who would not be willing to work in the IT/ITES industry and those who are not suitable for such work. Figure B.2 shows the process of this calculation.

The analysis for Indonesia and Kenya shows that the overall ready-to-hire population is 32,000 for Indonesia and 27,000 for Kenya. The population for Indonesia, however, has a relatively higher proportion suitable for data processing and IT services, whereas the population for Kenya has a higher proportion suitable for voice services. Box B.1

Figure B.2 Calculation of Total Stock of Ready-to-Hire Employees



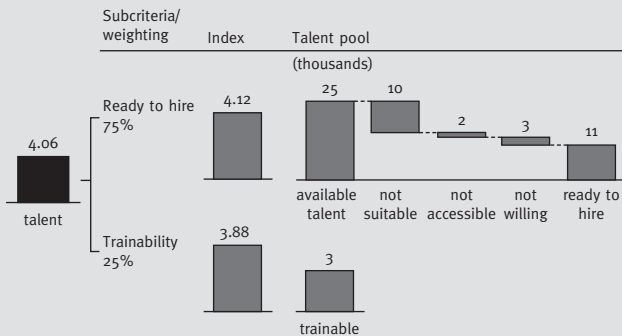
Source: McKinsey & Company 2008 consultancy inputs.

Box B.1 Calculating the Talent Index

Each year, approximately 51,000 students graduate in Kenya. Of these, roughly half, or approximately 25,500, students could work as generalists in data services (the other half would most likely work in the voice segment and are not considered here). Of the 25,500, 60 percent are suitable for data processing, leaving 15,300 graduates. Of the latter number, 90 percent are typically willing to relocate, and out of those, 80 percent are typically willing to work in the IT/ITES industry. Thus, approximately 11,000 graduates are included in the potential pool for data processing employees for Kenya. This is the number used for the ready-to-hire score (which ends up being 4.12).

In the LRI model, the ready-to-hire score represents 75 percent of the overall talent score. The remaining 25 percent is given by trainability, defined as the percentage of the population of graduates who are not currently suitable for IT/ITES work but who could be trained to work in the industry within a short amount of time and are both accessible and willing to work in the industry. In the case of data processing services in

Calculating the Talent Index: Data Processing in Kenya



Source: McKinsey & Company 2008 consultancy inputs.

Box B.1 continued

Kenya, 30 percent of the nonsuitable pool of graduates could be retrained in basic skills that will allow them to work in this segment of the industry. This represents approximately 3,000 more graduates, and translates into a score of 3.88.

Finally, the overall talent score is calculated. Given the 4.12 score for ready-to-hire index and the 3.88 for the trainability index, the final talent score for the data processing segment in Kenya is 4.06. The figure above shows this calculation.

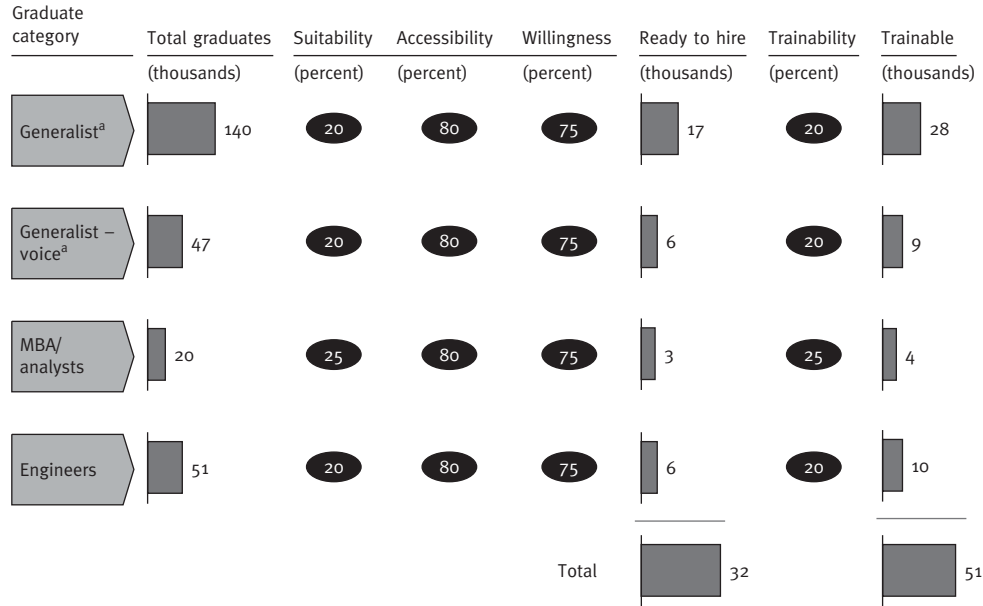
It is important to point out that the percentages for suitability, accessibility, willingness, and trainability in the figure above were estimated from in-depth interviews with main stakeholders in each of the countries (companies and government authorities). Actual percentages used in the analysis for Indonesia and Kenya are given in figures B.3 and B.4.

Source: Authors' analysis.

below shows how the talent index has been determined for Kenya and Indonesia.

Overall, neither of the two countries boasts a large number of generalist or skilled graduates who could work in the IT/ITES industry. Suitability appears to be a particular issue in Indonesia due to the labor pool's low level of English proficiency, the questionable educational quality outside the capital region, and an educational system that emphasizes theory over practical problem-solving skills. This latter issue was also mentioned in interviews as a problem in Kenya. In both countries, though suitable graduates are generally willing to work in the IT/ITES industry and relocate to do so, neither country is likely to be able to develop, at least in the short term, the high-yield, high-value end of the offshore IT/ITES business (that is, knowledge processing and IT) given that the majority of the hireable population in each country are generalists without special technical skills. Hence, the countries could look to develop data and voice processing services as they start to build and scale up the sector.

Figure B.3 Indonesia's Ready-to-Hire Population

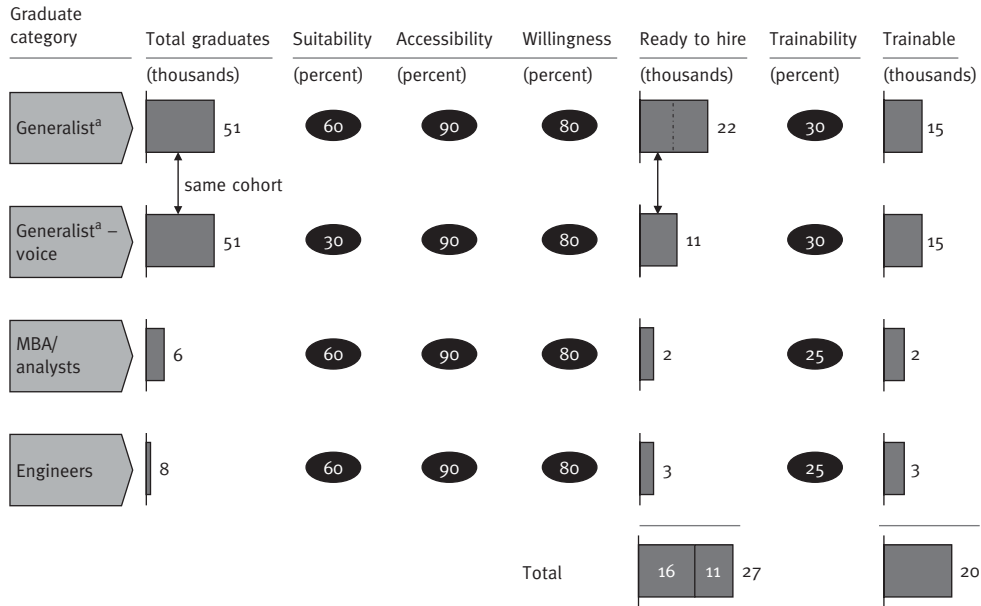


Source: McKinsey & Company 2008 consultancy inputs.

Note: MBA = master's degree in business administration.

a. 100 percent of graduating population is assumed to speak English.

Figure B.4 Kenya's Ready-to-Hire Population



Source: McKinsey & Company 2008 consultancy inputs.
 Note: MBA = master's degree in business administration.
 a. 100 percent of the graduating population is assumed to speak English.

An important difference between Indonesia and Kenya is in terms of scalability: Indonesia starts with almost 140,000 graduates each year, but only 20 percent of these are qualified to work in the IT/ITES sector due to issues of quality of curriculum. Kenya, however, starts with a much smaller pool of 51,000 graduates every year, but of these, 60 percent are suitable for work in the IT and ITES sectors. This implies Indonesia could probably dramatically increase the size of its IT/ITES talent pool if appropriate training and education initiatives were offered. The same cannot necessarily be said of Kenya, as its 60 percent suitability rate is very high compared to most developing nations. India, the Philippines, and the Russian Federation, for example, have suitability rates of 13 percent, 15 percent, and 10 percent, respectively (McKinsey Global Institute 2005). Indonesia could remedy this shortfall by improving secondary and tertiary education more generally, and by enrolling more students into university, even though this is a long-term solution.

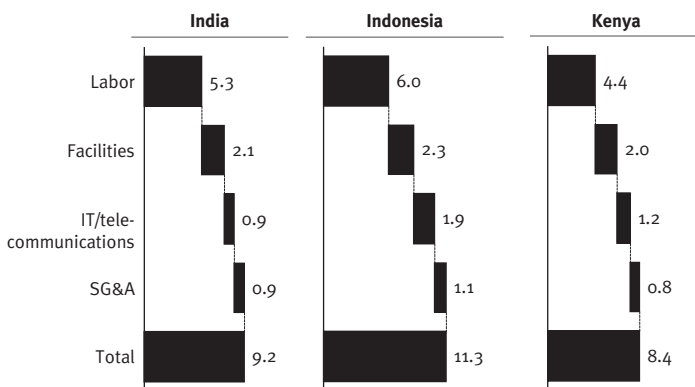
As an illustration of how difficult it is for a country to attain a score of 1 on the talent index (using data processing as an example), Indonesia would need to increase the suitability rate of its graduate pool to 60 percent. Kenya would need to turn out five times its current number of graduates. Though neither country should target only the quality or only the quantity of its graduates in order to build its talent pool, Kenya appears to face the more challenging task.

Cost

To evaluate the cost implications of IT/ITES, the LRI model uses two indicators: the overall cost of operations expressed in full-time equivalent (FTE), and the incentives provided by government authorities to attract investors to the IT/ITES industry. Figure B.5 shows the results of the cost index for Indonesia and Kenya, and includes India as a benchmark. The analysis indicates that both countries have a cost base sufficient to include them on a short list of possible off-shore locations, largely due to the relatively low wages paid.

As shown in figure B.5, costs of operations have been broken into four different categories: labor; facilities; IT/telecommunications; and selling, general, and administrative (SG&A) expenses. (In turn, the cost

Figure B.5 Cost of Operations: Data Processing
US\$/FTE/hour



Source: McKinsey & Company 2008 consultancy inputs.

Note: FTE = full-time equivalent; SG&A = selling, general, and administrative.

of operations index accounts for 75 percent of the overall cost index. The remaining 25 percent of the cost index is accounted for by the set of incentives that the country provides to the industry.) Labor costs, which account for more than half the total cost of operations, include not only data processing agents, but also management positions and support staff. Table B.1 shows labor costs for India, Indonesia, Kenya, and the United States for various subcategories of the IT/ITES industry. Note that low cost of engineers makes Indonesia more competitive than India in the IT services subcategory.

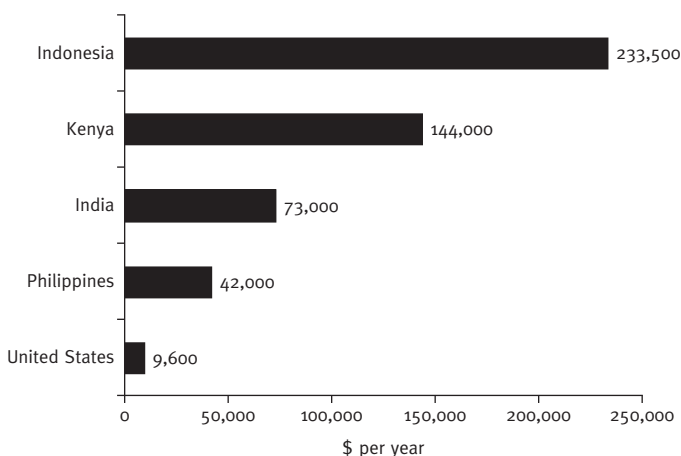
It is also important to mention that the analysis reveals that broadband costs in Indonesia and Kenya are high. In the case of Indonesia, broadband costs are so significant that simply bringing them down to Indian levels would result in an overall decrease of 10 percent in the total cost of operations for data processing in Indonesia. Such cases are rather atypical, however, because the cost of broadband tends to be an insignificant proportion of the overall cost. Figure B.6 shows the difference in average cost of a leased line of 2 megabits per second (Mbps) in India, Indonesia, Kenya, the Philippines, and the United States.

Table B.1 Labor Cost per Hour per Full-Time Equivalent for Data Processing
US\$

Country	Data processing	Voice services	Knowledge	IT services
United States	23.67	25.25	45.67	46.32
India	5.34	6.55	14.02	8.78
Indonesia	6.03	6.03	9.74	5.27
Kenya	4.41	4.85	12.73	7.50

Source: McKinsey & Company 2008 consultancy inputs.

Figure B.6 Average End-to-End Cost of a 2-Megabits-per-Second Leased Line



Source: McKinsey & Company 2008 consultancy inputs.

It is also observed that both Indonesia and Kenya could provide a more attractive incentive landscape to investors. Indonesia appears to have taken a particularly “hands off” approach with respect to development of the IT and ITES industry, as demonstrated by the absence of many of the common incentives used to bring in investors, including software parks, training subsidies, and subsidies for capital expenditures. Kenya, however, appears to have made a greater effort to

support the sector by providing fiscal advantages and capital expenditure subsidies (for example, subsidies to business process outsourcing [BPO] operators to compensate for high bandwidth costs); but there still remains much that could be done to provide an improved starting point for investors.¹⁵

Infrastructure

The quality of infrastructure index is divided into four different categories, collecting a total of nine indicators. Unlike previous dimensions of the LRI, the quality of infrastructure index weights each of the nine indicators equally. Table B.2 shows the indicators as measured for Indonesia and Kenya.

Overall, Indonesia performs better than Kenya in terms of quality of infrastructure. However, both countries suffer from poor connectivity, lack of good office space, and inadequate roads and railways. For Indonesia, infrastructure is predominantly in Jakarta and for the most part is not dedicated to IT (there are no sizable IT parks or IT special economic zones, for example). Network reliability also appears to be poor and transport infrastructure is lacking, possibly an artifact of Indonesia's archipelago status or high population density. Even in Java, however, roads appear to be poor. For Kenya, there is a general lack of world class network service levels, and a highly limited supply of Class A "ready to occupy" infrastructure such as that found in IT parks. In addition, Kenya's unreliable power distribution system results in higher costs for companies, as they must maintain in-house power generation systems.

It is important to note that a moderately poor infrastructure score, like a poor score in business environment or country risk, is not an absolute barrier to success in developing infrastructure in a country. This is because companies may invest in buildings, generators, and satellite connections, for example, to overcome certain infrastructure issues if it is justified from a business perspective. In addition, the national-level measures may mask infrastructure advantages at regional, provincial, or district levels. For example, India's scores in infrastructure are not stellar, even though it is the market leader in offshore IT/ITES

Table B.2 Quality of Infrastructure Index

Category	Measure	Indonesia		Kenya	
		Indicator	Index	Indicator	Index
Telecommunications / IT	Uptime of end-to-end network	96 percent	4	99 percent	3
	Mean time to restore (MTTR)	4 hours	1	8 hours	2
	Economist Intelligence Unit (EIU) connectivity rating (best = 10)	2.10	4	1.25	5
Real estate	Total inventory of class A space	15 million square feet	5	14 million square feet	5
	Vacancy rate of class A and B spaces	17 percent	1	8 percent	4
Power	Annual average power outage time	3.4 days	3	83.6 days	5
	Annual power demand as percentage of supply	62.9 percent	1	97 percent	1
Transportation	Total road length per capita	0.0070 kilometers	5	0.0016 kilometers	5
	Total rail length per capita	0.000029 kilometers	5	0.000082 kilometers	5

Source: McKinsey & Company 2008 consultancy inputs.

services by a clear margin. The important conclusion to draw about index results for infrastructure, environment, and risk is that while a poor score is an indicator of one or more areas that need to be addressed by policy and investment in possibly a sector-specific manner, a poor score does not represent an absolute barrier to entry.

Business and Living Environment

Neither Indonesia nor Kenya does well in terms of the business and living environment index, even though both countries show a score similar to that of India. Table B.3 summarizes the indicators and indexes used in the analysis.

Both Indonesia and Kenya are perceived as bureaucratic and lacking employer-friendly labor laws, and both countries are geographically remote from the United States (for this analysis, the United States was assumed to be the primary market for IT and ITES). This last element is customizable in the model: Kenya is more accessible to the United Kingdom, which might be the dominant market for its offshore activity, while Indonesia is closer to Shanghai, Beijing, and Tokyo as well as Australia—and perhaps more likely to attract investors from these places.

Risk

Neither Indonesia nor Kenya does well in the country investment risk profile in terms of the overall risk index. Kenya appears to have the slight edge, though, with an overall risk score of 3.4 (versus 3.9 for Indonesia), due to its greater regulatory stability, lower burden of bureaucracy, and greater currency stability—recent events there notwithstanding. Although Indonesia is perceived to be a high regulatory and economic risk, perception of the country appears to be improving; it rose from 133 to 123 in 2008 in the World Bank Group's Doing Business survey. It is worthwhile to note that country risk is not an absolute barrier to entry, given the Philippines' rapid growth in the BPO industry in spite of having a risk ranking comparable to Indonesia's.

Table B.3 Business and Living Environment Index

Category	Measure	Indonesia		Kenya	
		Indicator	Index	Indicator	Index
Government support	Government policy toward foreign investment (best = 5)	3.2	3	2.75	4
	Flexibility of labor laws (best = 10)	2.61	5	4.50	3
	Time to start business	3.5 months	4	1.5 months	2
Business environment	Overall business environment (10 = high)	5.6	4	4.89	5
	Regulations on employment practices (1 = least rigid)	44	3	21	2
Living environment	Rating on quality of life (best = 10)	5.2	3	5.70	3
	Crime	0.01 murder per capita	2	0.07 murder per capita	5
Accessibility	Time difference from U.S. Eastern Standard Time	12 hours	5	7 hours	4
	Number of direct daily flights to United States	1 flight	5	0 flights	5

Source: McKinsey & Company 2008 consultancy inputs.

Both Indonesia and Kenya also do poorly with regard to data risk. Software piracy in Kenya and Indonesia is common, with some sources estimating that more than 80 percent of software use in these countries is in breach of manufacturers' intellectual property. At the time of this writing, legislation is being considered by parliament in both countries to strengthen cyber laws and increase data protection. It is unclear, though, whether the new laws will have adequate enforcement mechanisms and whether there is the local expertise and political will to hold violators to account. Table B.4 includes the risk indicators and index calculated for each country.

Market Maturity

Neither Indonesia nor Kenya has an IT/ITES sector of sufficient maturity to be considered an attraction to new investors, though Kenya has the advantage of having a functional IT/ITES industry

Table B.4 Overall Risk Index

Category	Measure	Indonesia		Kenya	
		Indicator	Index	Indicator	Index
Regulatory	Stability of law and regulation (worst = 1)	3.37	4	4.50	3
	Transparency and fairness of legal system (worst = 1)	2.00	3	2.75	3
	Bureaucracy (worst = 1)	2.10	4	2.60	3
Country investment	Macroeconomic stability (worst = 1)	6.90	2	6.30	2
	Currency fluctuation (worst = 100)	50.00	5	30.00	3
	Capital freedom (worst = 5)	4.00	5	4.00	5
Data protection	Protection of intellectual property rights (worst = 1)	2.00	4	2.00	4

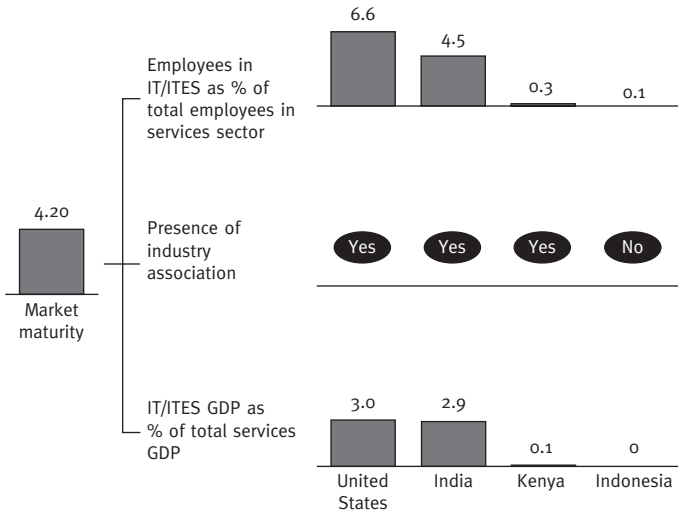
Source: McKinsey & Company 2008 consultancy inputs.

association and several companies working in the sector. As of 2008, Kenya's BPO industry represented about 4,000 FTE positions, with a small number of local and international operators, but with no large multinationals.

Indonesia, however, currently does not have significant activities to support the offshore market. With the absence of an industry association, there is no organized effort from either the private sector or the government to develop the industry. Small players in the country are not coordinated under an industry organization and cater only to domestic industry.

In general, the IT/ITES industry is still a nascent industry in both countries. Figure B.7 shows the components of the market maturity index for Indonesia and Kenya, along with that for India and the United States for comparison.

Figure B.7 Market Maturity Index



Source: McKinsey & Company 2008 consultancy inputs.

In summary, the market maturity analysis reveals that Kenya has an attractive and low cost base that compares favorably with that of India and is a very attractive feature in any offshore IT/ITES activity. The main challenge ahead is that the overall size of the talent pool may limit the size of the sector. Kenya has a structural issue, with a small educated population base that results in few university graduates. With a suitability factor of 60 percent, it seems that the quality of education is not an issue.

Indonesia's IT/ITES cost base also compares favorably with that of India. High-cost items such as connectivity are expected to fall in the near future. The talent pool is adequate to the needs of a modest-sized sector, though it could be scaled up through various targeted initiatives. Indonesia's labor force also may enter the IT and ITES industries at the lower end of the value chain, showing strong potential in data processing, which requires generalist skills. It is important as well to note the relatively large engineer pool, which may allow the country to build a larger IT services industry. However, there is a lack of graduates (both university graduates and MBA [master's degree in business administration] graduates) for knowledge services. Unlike Kenya, the offshore IT and ITES industries in Indonesia are essentially nonexistent. This makes Indonesia less attractive to investors, but at the same time represents a large opportunity.

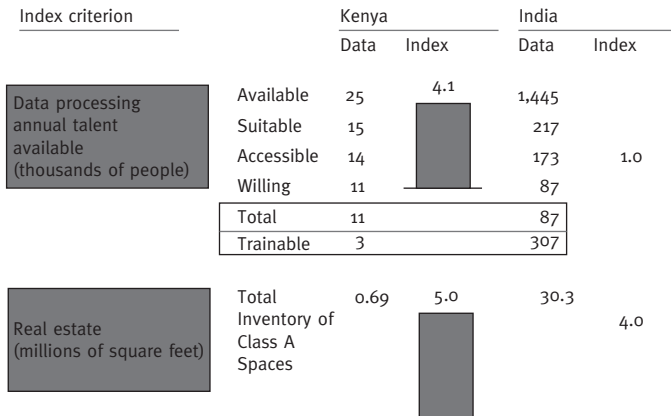
Using the LRI to Improve the IT/ITES Landscape in Kenya and Indonesia

From the analysis above, it is clear that both Kenya and Indonesia would need additional investments and sound policies to make themselves more attractive destinations for offshore IT and ITES sectors. How could government authorities in Kenya and Indonesia (or any country that carries out a similar exercise) go about improving and promoting their IT/ITES industry? The LRI identifies existing gaps and weaknesses and allows policy makers prioritize those areas that show a wider gap, increasing the overall location attractiveness. Though recommendations in this section are illustrative and by no means represent a rigid "to-do" list, they may be a starting point for a more structured discussion should any of these countries decide to use this tool.

In the case of Kenya, the main gaps are talent and real estate. Compared to India, these indicators pose a serious challenge to building sizeable IT and ITES sectors. As figure B.8 shows, the total ready-to-hire population in the data processing segment in India is nine times that of Kenya. The problem with talent in Kenya is not a matter of suitability of the talent pool (at 75 percent literacy and 60 percent suitability, it is already high), but the actual size of the available pool. Regarding real estate space, Kenya would require an increase by a factor of 40 to reach India’s level.

However, if Kenya adopts a niche strategy (for example, by providing BPO to support industries such as tourism, starting with the local market) and starts tackling these two problems with a medium-term strategy, then the one-to-one headcount comparison with India, a country that covers all vertical and horizontal ITES functions, would be less relevant. Similarly, if the country adopts such a niche strategy, real estate would not need to increase by a factor of 40 (although current levels are still low).

Figure B.8 Addressing Talent and Real Estate Gaps in Kenya



Source: McKinsey & Company 2008 consultancy inputs.

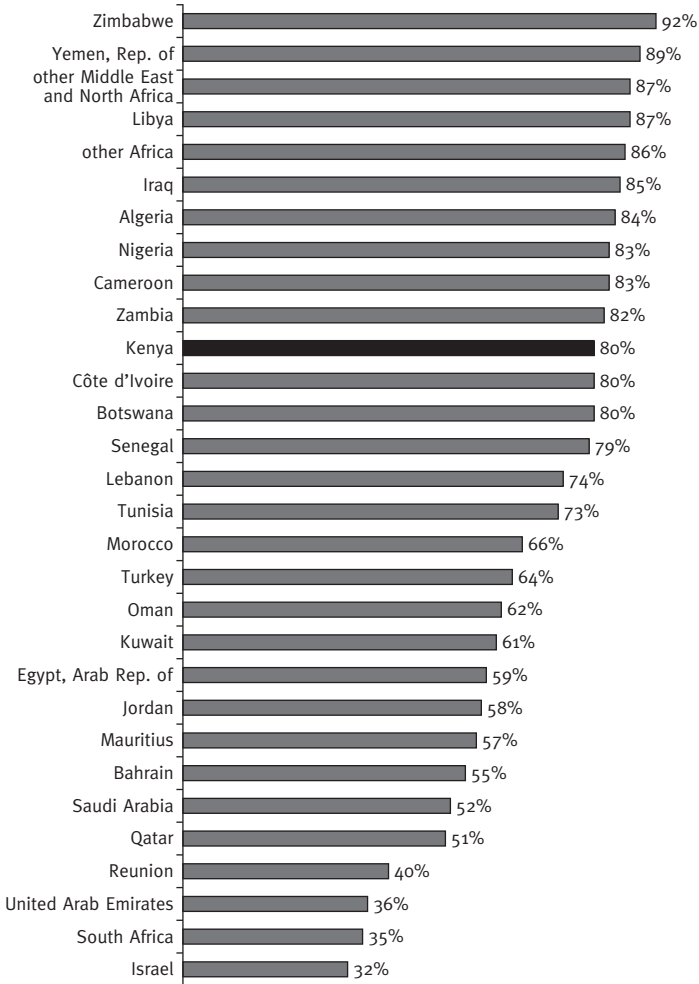
Under this scenario, in the medium term, Kenya should still increase the size of the available pool. Possible solutions might include improving bridge schools (from high school to college), recruiting talent directly from high schools, promoting immigration to attract regional talent, working with neighboring countries to develop a regional hub model, and building more universities, among others.

Other gaps would need to be addressed simultaneously. For example, broadband costs in the country are expected to reduce dramatically in the near future. This should also impact the country's connectivity rating. Improving the overall business environment, albeit a responsibility that transcends the sector, should be a priority for the government. Finally, if Kenya intends to attract, in the medium term, high-value-added IT services to the country, intellectual property rights issues must be resolved (see figure B.9).

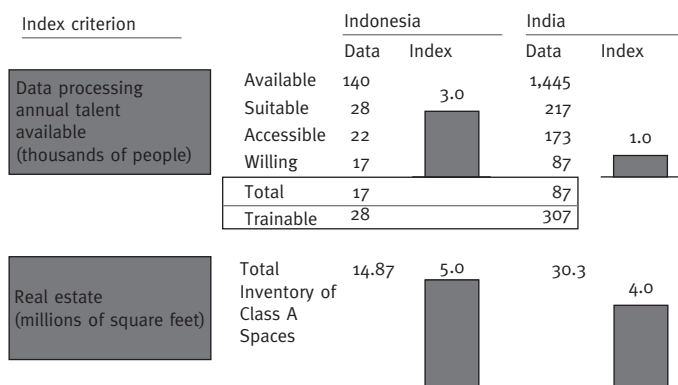
Indonesia, at first glance, seems to have problems similar to those of Kenya: a small ready-to-hire talent pool and limited real estate space (see figure B.10). However, with a population of 240 million (against 39 million in Kenya) and suitability and trainability ratios of 20–25 percent, Indonesia should be able to increase the overall size of its ready-to-hire labor pool. For example, by increasing suitability rates up to 60 percent (a rate similar to Kenya's), Indonesia would release 50,000 ready-to-hire graduates suitable for the data processing segment each year.

Regarding real estate, Indonesia has a previous experience trying to promote the IT sector: the Bandung High Tech Valley (BHTV) Project. The project was initiated by the Ministry of Industry and Trade, Indonesia (MITI) in 1996, with the objective of increasing exports of electronics, which at the time included IT, semiconductor, components, consumer electronics, telecommunications, and home appliances. Between 1997 and 1999, however, the Asian financial crisis shifted the focus of the government, and planned measures such as incentives, training, and support to entrepreneurs and small and medium enterprises (SMEs) were not implemented. In 2000, BHTV was especially affected by the global downturn of the IT sector. Today, the project exports mainly electronic hardware, and not many

Figure B.9 Percentage of Personal Computers with Pirated Software Installed, Middle East and Africa, 2008



Source: Business Software Alliance–International Data Corporation 2009, 13.

Figure B.10 Addressing the Talent and Real Estate Gaps in Indonesia

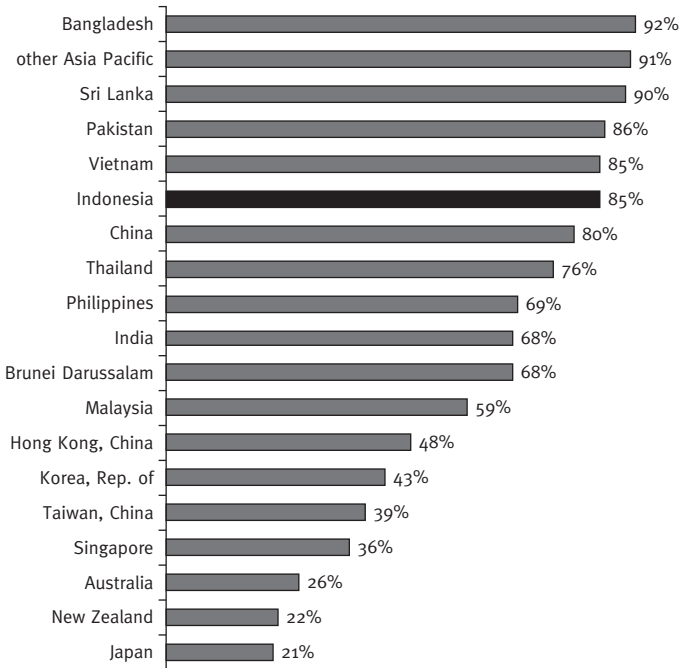
Source: McKinsey & Company 2008 consultancy inputs.

IT companies are established there. But the BHTV project could be leveraged to support the IT and ITES sectors.

Regarding intellectual property rights, Indonesia also reports a high rate of piracy, as shown in figure B.11. Taking into account the relatively low cost of engineers in the country and the availability of IT parks, tackling the problem of piracy could allow the country to start to cater the higher-value-added IT services segment.

Lastly, it is important to mention that addressing the regulatory, infrastructure, and risk issues identified in Kenya and Indonesia has proven possible in a number of other countries, including India. A common approach is to segregate the sector and provide market participants the resources they need in order to conduct business efficiently. Some examples include special IT parks with the required type of office space; back-up power systems and transportation to and from those facilities; legal status that specifically exempts IT/ITES companies from unnecessary “red tape” in their dealings with officialdom, provides special fiscal provisions and benefits, and allows them easier access to and repatriation of capital; and a dedicated state office

Figure B.11 Percentage of Personal Computers with Pirated Software Installed, Asia Pacific, 2008



Source: Business Software Alliance–International Data Corporation 2009, 12.

to help IT/ITES companies navigate or circumvent the bureaucracy. India still does not score well on the LRI in terms of risk, infrastructure and environment; even with almost half of the worldwide annual revenues in offshore IT/ITES services. Its success is attributable at least in part to the targeted deployment of resources rather than the attempt to set the entire country in order before opening for business. Improving infrastructure, regulation, and the business environment for isolated sectors can be the “thin end of the wedge” in reform generally; while national reforms might be difficult to push through against entrenched interests in a society, they can be relatively straightforward in an insulated, export-directed sector such as offshore IT/ITES.

These reforms could then be applied more rapidly to other sectors of the economy, after they have been implemented and proven to provide results.¹⁶

Impact on the Economy

The main section of this book described some of the economic impact that the IT and ITES industries have had in different countries. When analyzing the case for supporting these industries in any developing country, a very valid question is: What would the support needed by the offshore IT and ITES industries mean in terms of economic growth?

In the case of Kenya, if all enablers for industry growth are in place and the stock of workers is developed, the IT and ITES industries have the potential to create 22,000 new jobs by 2013,¹⁷ and almost 95,000 by 2018, assuming growth rates comparable to Eastern Europe's BPO industry. In turn, this would translate into an approximately \$333 million contribution to GDP in 2013 (representing 17 percent of the incremental growth in GDP from 2012 to 2013) and \$1.2 billion in 2018.

In Indonesia, there is potential to create 33,000 direct jobs in the IT and ITES industries by 2013, and 120,000 by 2018, assuming that all enablers are set at the same growth rates as those in Kenya. In Indonesia, the potential contribution to GDP is \$467 million in 2013 (2 percent of incremental GDP growth from 2012 to 2013) and \$1.7 billion in 2018.¹⁸

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 fiscal year runs from April 1 to March 31.
4. Some 26 percent of gross income spent by employees was housing related, followed by food items, durable goods, and vacation and leisure. In addition, IT services and ITES firms contributed to increased nonwage spending on construction, transportation, communications, and a host of other sectors.
5. According to a NASSCOM-McKinsey (2005) report, 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 fiscal 2010), and transport (650,000–700,000 drivers and assistants will be required to meet industry requirements in fiscal 2010).
6. According to the NASSCOM-McKinsey (2005, 15) report, the “two industries (IT and BPO) directly employ nearly 700,000 people and provide indirect employment to approximately 2.5 million workers.”

7. Despite the global financial crisis, the Philippines is reportedly still on track to achieve its Roadmap 2010 targets, including capturing 10 percent of the global market for ITES (BPAP 2009).
8. Some commentators find this overly optimistic, for example, Magtibay-Ramos, Estrada, and Felipe (2007).
9. The model is intended to be applied at a national level but could, in principle, also be used to compare “microclimates” such as cities or regions within countries.
10. The facility consists of the India Development Center, Microsoft IT-India, and the Microsoft Global Services Center.
11. This exemption is applicable to high-technology and large-scale manufacturing industries.
12. Chapter 4 of World Bank (2009) contains more detailed discussion of policies for promoting telecommunications backbone networks.
13. An additional measure of risk not included in the model is an execution risk parameter. However, it could be argued that such risk is covered in the industry maturity component.
14. Depending on the segment, willingness might be a high filter. In India, for example, willingness for IT services is 80 percent and willingness for data processing is 50 percent.
15. The authors do not advocate the use of government subsidies in all cases. Subsidies need to be considered on a case-by-case basis that takes into account the costs and benefits unique to each particular country, used where the benefit exceeds the cost and discontinued when the cost benefit calculation tips in favor of costs. Generally, however, government should make sure not to (a) distort the playing field in favor of offshore ICT and against other, potentially equally competitive sector growth; (b) use public funds to favor one sector over another unless there is clear evidence of larger social benefits; or (c) waste public funds on subsidies and benefits in areas where they are not necessary and simply lead to a transfer of tax income to a select group of private companies.
16. Presentations available at Information for Development Program, <http://www.infodev.org>, provide additional examples of policies used in other countries.
17. As of 2008, there were already 4,000 positions in the Kenyan BPO industry.

18. Estimations of impact on GDP do not take into account the opportunity costs of jobs created (that is, the contribution to GDP that would be made by the potential labor force if they did not work in the IT/ITES industries). However, experience in other countries shows that IT/ITES jobs are usually better paid than alternative options for graduates. In Indonesia, for example, BPO and IT services positions pay as much as 7.5 times GDP per capita and are among the best-paid positions for recent graduates.

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