IMPROVING COMPETITIVENESS AND INCREASING ECONOMIC DIVERSIFICATION IN THE CARIBBEAN

The Role of Information and Communication Technologies

Information for Development Program

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In reality, the Caribbean economies are faced with distinct challenges on their road to development. Once dependent on agricultural and extractive industries, they have seen protective policies disappear, and their products commoditized. Their small size and high labor costs make these industries unviable when competing with the scale and low labor costs of giants like India and China—or even high labor but low total cost environments such as the United States and Canada. Now these countries face modest growth rates (1.17 percent), high unemployment rates (15–20 percent) and an overly-responsive government sector trying to maintain social cohesion and acting as an unemployment buffer. Their relative geographical dispersion has also made regional integration and harmonization a slow process.

Small island economies cannot produce in scale quantities, and have additional built-in logistical costs. In the case of the Caribbean, telecommunications costs are high and labor productivity (although not necessarily average wages) is low. In all but Trinidad and Tobago, energy costs are high. These structural problems are augmented by the lack of an entrepreneurial class and world-class firms. Companies in much of the Caribbean have succeeded in the past and acting as an unemployment buffer. Their relative geographical dispersion has also made regional integration and harmonization a slow process.

Small island economies cannot produce in scale quantities, and have additional built-in logistical costs. In the case of the Caribbean, telecommunications costs are high and labor productivity (although not necessarily average wages) is low. In all but Trinidad and Tobago, energy costs are high. These structural problems are augmented by the lack of an entrepreneurial class and world-class firms. Companies in much of the Caribbean have succeeded in the past.
by managing a few relationships and taking advantage of trade preferences. As these disappear, many firms are inadequately prepared to tackle global competition and serve sophisticated consumers abroad. Under these mounting pressures, the current high standard of living in many of the smaller islands is unsustainable, and the low economic achievements of the majority are getting worse.

Various analyses of the region come to similar conclusions—access to telecommunications and Internet services is improving through liberalization across the Caribbean, but telecom monopolies and small markets make for exorbitant prices. Adoption is lower and less reliable than one would hope, with obvious variations among countries. Outbound calls are still priced higher than inbound calls and Internet services are more costly than in countries with comparable income levels. For instance, the cost of 20 hour dial-up access in St. Lucia is US$22.22 compared with US$8.42 in Malaysia.

As a result of these high prices, Internet density is particularly low in the Dominican Republic, Haiti, Suriname, and St. Vincent and the Grenadines, at 3.64, 0.96, 4.16 and 5.98 users, respectively, per 100 inhabitants. Other countries, such as Jamaica, and St. Kitts and Nevis have relatively higher usage rates of more than 20 users per 100 inhabitants. These are all substantially lower than in the United States, Singapore, and New Zealand.

High-speed connection is as high as US$400 per month in places such as Antigua, Barbados, and Jamaica, while it costs US$460–50 in the United States.

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Educational attainment is also an important challenge in the region. A popular misconception is that the skill level in the Caribbean is relatively high. While primary education is universal, with enrollment rates of more than 90 percent in 2002, and secondary schooling is improving, tertiary levels are one of the region’s biggest educational weaknesses. Despite the fact that countries like Barbados, Bahamas, and the Dominican Republic have more than 20 percent of their youth attending university, the Eastern Caribbean States (ECS) average a meager 2 percent. In the ECS a small group of graduates go abroad to study, which raises tertiary enrollment rates to approximately 12 percent; yet the majority of the local workforce has barely finished primary school.

2. Improving Competitiveness and Increasing Economic Diversification in the Caribbean

Educational attainment is also an important challenge in the region. A popular misconception is that the skill level in the Caribbean is relatively high. While primary education is universal, with enrollment rates of more than 90 percent in 2002, and secondary schooling is improving, tertiary levels are one of the region’s biggest educational weaknesses. Despite the fact that countries like Barbados, Bahamas, and the Dominican Republic have more than 20 percent of their youth attending university, the Eastern Caribbean States (ECS) average a meager 2 percent. In the ECS a small group of graduates go abroad to study, which raises tertiary enrollment rates to approximately 12 percent; yet the majority of the local workforce has barely finished primary school.

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4. Data for education attainment comes from the average enrollment for the education levels in the region: St. Kitts & Nevis (70%); St. Lucia (76%) and St. Vincent & Grenadines (97%). 5 In terms of labor force educational attainment, St. Lucia, St. Vincent and Grenada have over 65% of the adult population with only a primary level education.
has contributed to the continuing dominance of mostly low-skilled sectors in the economy, where ICT usage is less common, and where long-term economic growth opportunities are limited.

With these many structural disadvantages, Caribbean economies must focus on premium niche segments, even in tourism. Yet they persist in following low-cost strategies, despite the fact that their economies are clearly high cost.

There are a few companies that are successfully taking advantage of niche manufacturing. Gale Force Windows, for example, is a regional company based in Antigua that builds high-end, hurricane-resistant windows and doors. Their business proposition is building custom-made windows to fit architects’ creativity, as opposed to the majority of international competitors that prefer to work with standardized sizes and shapes. In a fully digitized environment, they are able to provide on-demand price quotes, and price-competitive products. They train their own staff and offer competitive wages for factory workers starting at twice the minimum wage.

Likewise, there are increasingly attractive opportunities in niche service sectors. Leisure marine is one sector with high potential for the Caribbean to provide a competitive and differentiated product, both as a niche market of the tourism industry and for complementary services like pleasure boat building and maintenance operations. Offshore financial services, a long tradition in the Caribbean, also have potential but need upgrading. Islands like the Bahamas are migrating from ‘banner like’ companies without a physical presence to “Virtual Headquarters” that require trained staff using sophisticated interfaces to communicate with their client base. To attract these businesses, they have implemented stringent regulations to improve monitoring, such as establishing a financial intelligence unit to oversee the offshore sector and banning anonymous accounts and anonymous international business corporations. These types of services provide positive spillovers because of their demand of supporting staff, specialized software applications, and strategic and legal consulting services, among others.

The Vision for the Future
The major opportunity for the future of these island states is in the transition many have started to a service economy, and a push towards niche manufacturing sectors that can supply high paying jobs. While
there is a push towards diversification, given the size of these economies, the goal should be towards adding complimentary growth with robust business strategies, to promising new and exciting clusters. Instead, the key traditional service industries of tourism and financial services have become commoditized in some Caribbean countries, leading to lower profits for their home economies. As illustrated in the graph below, growth in financial services has deteriorated below, growth in financial services has deteriorated or stagnated in countries where it represents a sizeable portion of GDP due to greater scrutiny of their banking practices in the ECS and consolidation in the rest of the Caribbean. The island countries have faced a similar decline due to the September 11 terrorist attacks in the United States, as well as a more commoditized model evolving throughout the Caribbean. Countries such as Jamaica and the Dominican Republic have seen a decline in daily spending and length of stay by tourists. Caribbean economies must return to the days when they created new types of tourism and financial services, not the current reality in which they work harder to execute 30-year-old strategies, while others all over the globe have innovated beyond them and the best customers have moved on.

The transition to niche manufacturing and high-end services is not easy for economies without the necessary skill level, such as those in the Caribbean. However, there are other small island countries to learn from that have managed this transition successfully. Ireland had a dramatic transformation from a largely low-cost agricultural and manufacturing economy to a service, pharmaceutical, and information technology economy that has achieved a three-fold per capita GDP increase since 1970—accelerating from negative growth to the fastest in Europe. Through coordination between the private and public sectors, Ireland targeted and attracted companies in key sectors. In turn, the government created the necessary infrastructure and investments in education to supply the skill level required in the engineering and computer science sectors. Ireland went from having the worst schooling record in the European Union to graduating, proportionally, the highest number of scientists and engineers in the European Union (EU). The surprisingly low levels of tertiary enrollment in the Caribbean offer an important area of improvement if they aim for a similar transformation.

Other countries, such as Indonesia, Singapore, and South Korea, point to the importance of creating linkages between local firms and those attracted by Free Trade Zones (FTZ) or Cyber Parks, a growing phenomenon in the Caribbean. The necessary “spill-over effect” of such foreign firms depends in great part on the absorption capacity of the host countries, the terms of the arrangement negotiated between the country and the firm (e.g., technical training, percentage of management which is required to be local, reinvestment, etc), and the ability of its local firms to offer the skills and reliable quality inputs required by the FTZ companies. Weak local infrastructure of firms and skills tend to be the limiting factors, which these Asian countries have addressed through financial incentives for joint ventures, institutional protection of intellectual property, and an upgrade of human capital. But the Caribbean, in general, has not.

Many countries in the Caribbean and Latin American have tried to duplicate three countries’ experiences by competing to attract the same types of companies that Ireland and Singapore did 20 years ago, and thus have faced limited success. There is a push towards diversification, given the size of these economies, the goal should be towards adding complimentary growth with robust business strategies, to promising new and exciting clusters. Instead, the key traditional service industries of tourism and financial services have become commoditized in some Caribbean countries, leading to lower profits for their home economies. As illustrated in the graph below, growth in financial services has deteriorated or stagnated in countries where it represents a sizeable portion of GDP due to greater scrutiny of their banking practices in the ECS and consolidation in the rest of the Caribbean. The island countries have faced a similar decline due to the September 11 terrorist attacks in the United States, as well as a more commoditized model evolving throughout the Caribbean. Countries such as Jamaica and the Dominican Republic have seen a decline in daily spending and length of stay by tourists. Caribbean economies must return to the days when they created new types of tourism and financial services, not the current reality in which they work harder to execute 30-year-old strategies, while others all over the globe have innovated beyond them and the best customers have moved on.

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However, the Caribbean can take advantage of its location and climate to pursue other new promis-
ing clusters. For example, healthcare tourism pre-
sents a profitable option—from wellness centers offering rehabilitation facilities for people undergo-
ing surgical procedures or retiree complexes, to cut-
time bone-marrow research, like the facility recently 
launched in Barbados. Proximity to North 
American and European markets, an elaborate 
tourism industry, and well-trained healthcare prac-
titioners can make the Caribbean an appealing destina-
tion for this market.

Further regional coordination could also provide 
competitive and differentiated tourism experiences, 
such as in the yachting business. There is a growing 
demand in North America for lower-cost pleasure 
boat building and service facilities, which can be 
linked to tourism activities. The yachting business, 
which is a $30-billion industry in the United States 
alone, has doubled in size in the last 10 years. It 
offers a good opportunity for the Eastern 
Caribbean to become the next high-end destination for 
the leisure marine community. Islands such as 
St. Barts and St. Martin have been able to exploit 
this business by attracting high-end boats. Of the 
average expenditure per week of a luxury yacht 
($US$75,000), more than 90 percent goes to food, 
accommodations, entertainment, etc., which is an 
indication of the potential tourism revenue that an 
island in the Caribbean can earn. With further 
integration and collaboration, the Eastern 
Caribbean could become a destination for the 
leisure marine community, offering unique and var-
ed tourism experiences as well as export boat 
building. Creating a one-stop-shop would require 
upgraded services, logistical coordination among 
the islands to streamline customs and immigration; 
and improved tourism packages targeted specifically 
to these travelers.

Opportunities also exist in niche manufacturing, 
such as medical devices and niche final consump-
tion goods. While some firms are exploiting the 
potential of these industries, most firms are still 
competing on low-cost models and exporting primarily 
to their neighboring Caribbean markets. As 
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potential for the region. There are some good reasons for this, particularly the choice of low-wage centers, such as call centers, and the failure to link foreign investment to local skills. Outsourced Business Processes began in the Caribbean in the 1980s with multinational looking for low-cost markets near shore. While some businesses were originally successful, such as Caribbean Data Services from American Airlines, firms eventually fled to lower cost centers like India and the Philippines. As the needed services became more complex, the Caribbean was not able to upgrade its technological and communication infrastructure or skill level to compete. Instead, almost every Caribbean country has experimented with subsidized telemarketing call centers, which in the end compete on low labor costs and low-cost connectivity, neither of which the Caribbean can supply.

Demystifying the Call Center Fad

Call Centers Antigua Limited (CCAL) was a joint venture between the government of Antigua and Barbuda and Caribbean Information Technologies (CIT). The government invested $50 million in a 50 percent stake in the call center, with the goal of creating 5,000 jobs with exposure to IT skills. In the end, the wages offered were not very attractive at US$110–150 per week compared with manufacturing jobs that paid close to US$200, and highest, jobs in a Internet gaming of US$750/week. At these wage levels and low skill levels, the call center became the temporary holding place for people between jobs looking for better opportunities. The CIT promised to create more than 800 jobs, but only employed close to 200 people, and has since closed.

Jamaica had a similar experience. A fund was created from the proceeds of a spectrum auction to encourage the development of international call centers. The funds were lent at high interest rates, and coupled with varying results. Most investors experienced disinterest with the inadequacy of the skills of the local labor force, local business rule and regulations, and some of behavior (work ethics, business acumen, etc).

Free trade zones (FTZs) and Cyber Parks have also been erected throughout the Caribbean in hopes of attracting foreign exchange, providing employment, and the desired ‘spillover effects’ in technology innovation. FTZs started focusing primarily in manufacturing such as textiles, where countries competed on low-cost markets near shore. While some businesses were originally successful, such as Caribbean Data Services from American Airlines, firms eventually fled to lower cost centers like India and the Philippines. As the needed services became more complex, the Caribbean was not able to upgrade its technological and communication infrastructure or skill level to compete. Instead, almost every Caribbean country has experimented with subsidized telemarketing call centers, which in the end compete on low labor costs and low-cost connectivity, neither of which the Caribbean can supply.

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ICT-enabling productive clusters

Despite the mixed results of ICT clusters, ICT is an extremely useful, indeed necessary, tool. ICT plays an essential role in economic development, as it is an invaluable input for competitive firms and
for the average citizen to participate more actively in the economy. Technology does not, however, change the fundamental burdens on Caribbean economies to create great companies. With notable exceptions, the economies of the Caribbean contain firms that have persisted through artificial protections, commoditized products, or the exploitation of natural resources. This is a strategy that was never sustainable, and is now no longer even profitable. ICT can help these firms become more productive by transforming the way they do business and finding new ways for them to engage in the global economy.

The appropriate application of specific technologies to industrial clusters can make a tremendous difference to the firms within that cluster. Firms can learn, market, and sell online. At the very least, remaining near the forefront of the technological frontier in one’s industry is a minimum pre-condition for global competition and, hence, economic growth. This is particularly important in the ever-increasing service clusters that are the necessary growing force in much of the Caribbean. Services, especially tourism, are becoming ever more complex and individualized. Technology is essential in creating these experiential packaged service offerings.

However, many government and business people in the Caribbean do not see the practical link between ICT and the development of their economies.

ICT can prove to be an indispensable tool in fostering productivity and innovation, which in turn, can spur growth and prosperity. At the root, ICT allows for increased learning and more customized service. Whether regional firms and governments use ICT to become smarter – or merely cheaper10 – will determine whether it is the key to increasing wealth or simply slowing the decline into poverty. This report highlights and identifies five opportunities created by ICT that are particularly important for Caribbean economies as they seek to become competitive. Some firms and governments are already taking advantage of these benefits to chart a path for a more prosperous future. The role of governments and multilateral aid organizations is to support these types of initiatives and eliminate their constraints to progress.

In essence, the effective use of ICT can improve firm level productivity and innovation by allowing for more cost-effective and fluid communication with customers; improving logistics; overcoming the constraints imposed by distance; helping firms understand their competitive positioning; and enhancing transparency.

1. Communicate with Customers and Forward Integrate. Properly executed business strategy starts with the customers’ needs. Successful firms are able to identify demanding and underserved customers and develop methods to effectively service those customers. Firms compete by embedding unique insights into the products they produce and the channels they sell those products. Those insights can be captured through interactions with, and feedback from, customers. ICT provides a quick and cost effective way to keep that communication active and permanent. This ability is key in sectors such as tourism, which is a cornerstone of every Caribbean country. Instead of falling into low-cost models, such as the all-inclusive or enclave tourism taking over islands such as Jamaica and the Dominican Republic, countries need to foster a ‘total island experience’. Countries that do so strive to make the entire country a destination, and in doing so create a wide range of experiences from which a visitor might choose. Unique Jamaica, a cluster of 100 small hoteliers and attractions in Jamaica, has done this through joint marketing and upgrading. Together, this cluster devised a vision to attract the adventure/nature tourists, and created several customized tour packages in culture, nature, and food themes. ICT allowed them to do a cost-effective marketing campaign, to communicate among the members, and develop an interactive Web-based booking engine. Bermuda Escapes, founded by Axiom Computer, is also a good example of how a simple technical solution of cataloging and coordinating tourism experiences through a single back-end database can make an important difference in the tourists’ experiences. Concierges are able to arrange complete itineraries for their guests, and the industry in general has reliable data on what visitor’s value. Small

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ICT can prove to be an indispensable tool in fostering productivity and innovation, which in turn, can spur growth and prosperity. At the root, ICT allows for increased learning and more customized service. Whether regional firms and governments use ICT to become smarter – or merely cheaper10 – will determine whether it is the key to increasing wealth or simply slowing the decline into poverty. This report highlights and identifies five opportunities created by ICT that are particularly important for Caribbean economies as they seek to become competitive. Some firms and governments are already taking advantage of these benefits to chart a path for a more prosperous future. The role of governments and multilateral aid organizations is to support these types of initiatives and eliminate their constraints to progress.

In essence, the effective use of ICT can improve firm level productivity and innovation by allowing for more cost-effective and fluid communication with customers; improving logistics; overcoming the constraints imposed by distance; helping firms understand their competitive positioning; and enhancing transparency.

1. Communicate with Customers and Forward Integrate. Properly executed business strategy starts with the customers’ needs. Successful firms are able to identify demanding and underserved customers and develop methods to effectively service those customers. Firms compete by embedding unique insights into the products they produce and the channels they sell those products. Those insights can be captured through interactions with, and feedback from, customers. ICT provides a quick and cost effective way to keep that communication active and permanent. This ability is key in sectors such as tourism, which is a cornerstone of every Caribbean country. Instead of falling into low-cost models, such as the all-inclusive or enclave tourism taking over islands such as Jamaica and the Dominican Republic, countries need to foster a ‘total island experience’. Countries that do so strive to make the entire country a destination, and in doing so create a wide range of experiences from which a visitor might choose. Unique Jamaica, a cluster of 100 small hoteliers and attractions in Jamaica, has done this through joint marketing and upgrading. Together, this cluster devised a vision to attract the adventure/nature tourists, and created several customized tour packages in culture, nature, and food themes. ICT allowed them to do a cost-effective marketing campaign, to communicate among the members, and develop an interactive Web-based booking engine. Bermuda Escapes, founded by Axiom Computer, is also a good example of how a simple technical solution of cataloging and coordinating tourism experiences through a single back-end database can make an important difference in the tourists’ experiences. Concierges are able to arrange complete itineraries for their guests, and the industry in general has reliable data on what visitor’s value. Small
hotels and restaurants, and households with imported high-quality meat products, has seen its sales increase 20 percent per month since it started an e-mail marketing campaign. Its success is due to the significant Internet penetration rates in the high socio-economic segments of the Dominican Republic population. Country Traders, a Blue Mountain coffee distributor in Jamaica, also successfully experimented using the Internet as a sales channel. When it sold bulk green beans to overseas buyers who then roasted and branded the beans, the company captured very little of the value. By selling branded finished products through a simple online ordering service and using a local courier, the company has found an entirely new market for its coffee beans, numerous intermediaries and improved its profits. Similar small-scale ventures are sprouting up throughout the region in hot sauces, crafts, etc., which are utilizing ICT to expand their markets, customize their products, and more effectively communicate with their customers.

2. **Improve Logistics.** ICT can improve efficiency when it is incorporated both inside the organization and used for transactions along the value chain, allowing for better times to market, improved coordination of supply and demand, and excellent customer service. Given the vast inter-Caribbean business and dispersed nature of the Caribbean islands, this coordination is a priority for regional companies. Companies like insurer Sagicor now can reply to claims from all over the Caribbean in two days, instead of weeks, the average timeframe when their offices were not digitally connected. Governments also have much to gain from efficiency improvements in the provision of services, particularly in customs and immigration, which affect tourism, yachting, and trade in general. In agriculture, where most of the players are small and fragmented, there is an important benefit to eliminating information asymmetries. A recent pilot project sending voice messaging to commodity market prices to farmers in Jamaica has been very popular, given the ubiquitous nature of mobile phones in the island. A locally based consulting firm is exploring how this service can be launched across the island on a for-profit basis. Gale Force Windows, the manufacturer of hurricane resistance windows in Antigua, is able to provide immediate pricing quotes by analyzing the AutoCAD drawings sent by architects and developers throughout the Caribbean.

3. **Make Distance Irrelevant.** Given the dispersed nature of these island economies, ICT can create significant value by allowing the free and instant transport of digitized knowledge and products. Caribbean companies are using ICT to expand their market base and overcome geographic distances, the rate of deployment and usage varies significantly. The service sector is the most progressive, especially the consulting and offshore financial services industry, which in 2000 represented $10–12 trillion and is forecast to grow at 15 percent per year. As these services have commoditized and are little more than tax havens, the next opportunity for the Caribbean is further developing the “virtual headquarters” coupled with first-rate client services, which requires utilization and deployment of advanced ICT. Among the technologies most demanded are interactive asset management tools and brokerage services, built around sophisticated technical components, secure applications and aggressive investment strategies. However, today’s firms in the offshore sector either have the IT expertise in-house, or hotels and restaurants, and households with imported high-quality meat products, has seen its sales increase 20 percent per month since it started an e-mail marketing campaign. Its success is due to the significant Internet penetration rates in the high socio-economic segments of the Dominican Republic population. Country Traders, a Blue Mountain coffee distributor in Jamaica, also successfully experimented using the Internet as a sales channel. When it sold bulk green beans to overseas buyers who then roasted and branded the beans, the company captured very little of the value. By selling branded finished products through a simple online ordering service and using a local courier, the company has found an entirely new market for its coffee beans, numerous intermediaries and improved its profits. Similar small-scale ventures are sprouting up throughout the region in hot sauces, crafts, etc., which are utilizing ICT to expand their markets, customize their products, and more effectively communicate with their customers.

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4. Understand and Improve Their Competitive Positioning. As globalization has eliminated the physical barriers between markets, it has also done the same with competitors. With competition no longer confined to the neighboring plantations, mines and factories, today's companies need to compete with global firms that can more easily enter existing markets and take away once loyal customers. Previously the domain of only the largest firms with deep pockets, ICT can now help firms of all sizes gather customer and competitor information in real time, allowing them to make timely and informed decisions about how and where to compete. Members of the music industry in Jamaica used such access to information and online surveys about international labels to reposition themselves and find customers around the world that would be interested in recording music in Jamaica. A new organization, "Jamaica Signature Beats" is working to remove previous barriers to the development of these services (such as fragmentation, low trust and lack of professionalism in the industry) by doing joint marketing activities and creating certification and training for professional studios. Similarly, in manufacturing, S. Jäkel – a soft drink company in Trinidad and Tobago was one of the early innovators that realized it was competing in a global market. Through in-depth research of the global market, it identified the untapped segment of 4-10-year-olds, and has built a global brand, "Chubby", now sold by major retailers, such as Wal-Mart and Kroger.

5. Enhance Transparency. Government can and should be avid users of ICT, both to improve the efficiency and transparency of its services and to set the example for the rest of society. From broadly available information and downloadable forms to transactional capabilities, government services can become increasingly efficient. Ease of access to pertinent information such as business licensing, customs, and tax requirements is critical, particularly for private sector competitiveness and new business creation. Given the size of government intervention, this is especially true for the Caribbean. Despite the need, this is probably the hardest sphere to implement these types of reforms, given the adversary to 'redundancies' created by upgrades in technology, and the lack of market incentives. The Antiguan Office of Technology has managed to create a local loop to connect all government buildings, and has already provided every employee with e-mail access. There are vast opportunities in this realm, starting with improving the efficiency and transparency of the customs and port facilities, which currently are behind Central America. The Dominican Republic holds containers on average for seven days, compared to four in Mexico and El Salvador. High connectivity costs and low educational levels are some of the biggest obstacles to further advancements in e-government initiatives in the region.

outsource most of this work to North America. Another industry that competes without borders through ICT is gaming, which has had positive spillover effect in places such as Antigua, at some point providing US$25 million in government revenue and employing and training engineers. Web-designers and customer service representatives at competitive salaries. The gaming industry is completely Internet-based, offering both casino and betting options. For this industry to thrive, it needs to be well-regulated, to provide safeguards from money laundering, and transparency to be able to lobby credit card companies to allow online betting. Good regulations, a solid banking system, and reliable connectivity have attracted firms to Antigua, despite the high connection fees charged by C&W.

ICT Opening Markets for SMEs

Small and medium-size companies, like Erica’s Country-Style in St. Vincent, have been able to benefit from the Internet by opening their products to whole new markets. With annual sales of US$200,000, Erica’s Country-Style offers pepper sauces and food products to whole new markets. Retailers, and even food trucks in the Caribbean and U.S. market. After the launch of its website, the company started receiving orders from the U.S. market, which now accounts for 10 percent of its sales. This growth has prompted the use of a U.S. distributer to save on shipping charges.

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While other sources of efficiency and innovation exist, the five opportunities outlined above are particularly important for firms in emerging economies. They can be put into practice immediately and provide progressive results. The most important challenge for businesses is to access new technology, in the necessary mental shift in how technology can improve businesses, and not necessarily in high capital costs. Governments, private sector stakeholders, and civil society must look at the creation or strengthening of firm-level advantages when assessing the impact of a given ICT initiative.

A more competitive approach is required: one that begins from the bottom up as opposed to the top down. Beginning with the business climate and identifying ICT initiatives to improve it will more quickly focus Caribbean players on the highest-yield projects. While wiring every town with broadband connections may yield wide-ranging benefits, it may not deliver the same economic impact as connecting every firm in the tourism industry to a digital marketplace. Ultimately, both are excellent aspirations, but this paper is about prioritization and choice. Fortunately, as the examples above illustrate, when beginning from the ground up, the opportunities are plentiful and, frequently, cost-effective.

**Recommendations**

The benefits described above, however, are hard to measure. Until better metrics develop, the growth and sophistication of businesses, the rise of entrepreneurs taking advantage of technology breakthroughs, and firms paying high and rising salaries are good metrics for governments to assess progress. A myriad of digital products and services are now being traded and exchanged through cyberspace. It will be especially important to know how to compete in this arena, especially for countries like the small islands states of the Caribbean with historical geographic disadvantages, such as their small scale and dispersed nature.

There is much that governments and multilateral donor organizations can do to improve the business environment so that healthy and innovative businesses can develop and utilize ICT as a tool for improving competitiveness and increasing market opportunities.

### 1. Facilitate Access

**Access to technology, as noted earlier, is essential for firms and clusters to compete globally.** There has been much written about basic and specialized access, including a variety of metrics to determine how and whether a country has a competitive technological platform. They all boil down to one thing: can a businessperson get on the Internet and talk on the telephone with reasonable reliability, and at a cost on par with his/her global competitors? In the Caribbean, the situation is suboptimal in this regard, with some of the highest connectivity prices in the region, and in general, uncompetitive telecommunication markets. For instance, outbound calls are more expensive than inbound calls. Internet density is still substantially lower than in the United States, Singapore, and New Zealand, and the cost of high-speed Internet is exorbitant (See graph on page 11).

The liberalization of telecom services is taking place in mobile telephony, but the process needs to be sped up, particularly for advance services such as broadband. New technologies, such as Wi-Fi or Wi-Max (longer-range wireless technology), need to be encouraged and widely embraced. Most countries continue to grapple with the problems of putting in place effective telecommunications regulations and moving forward with the liberalization process (for example, Trinidad and Tobago, Guyana and Belize among others, are facing these delays). Hence, one of the main imperatives is to set clear deadlines for completing the liberalization process, and to set up statutory bodies to lead and instill continuity in the process of reform. The creation of a telecommunications authority is also in an incipient stage in most of these countries and their technical competencies (i.e. standards, competition law, accounting regulation, etc) are still deficient. Further liberalization will likely hinge on the competence, technical capabilities, and independence granted to these authorities so that issues such as inter-connectivity, rate-setting, and investment...
incentives in telecoms are set to mimic, as closely as possible, a competitive model.

Providers of international connectivity for data and voice, as well as fixed lines, are in most of the Caribbean de facto monopolies, because there is no alternative submarine cable network. There is also little economic incentive to invest in underground cable as a second comer in the business in small islands like those in the Caribbean. While current high prices might make it appealing, it is not hard for a regional monopoly like Cable & Wireless (C&W) to drop local prices and drive competitors out of business. Thus so far, all land-line connections from fixed telephones to broadband access required for Internet applications are bound to use the incumbent’s network at their set price.16

Some Internet Service Providers (ISPs) are already providing Wi-Fi access to the Internet, but the rate of adoption and relatively slow speed offered are still hampering this technology’s full potential. As pointed out in a recent study by Eurostrategies, a European-based consulting company, the quality of Wi-Fi service in the Caribbean is still held back by inefficient control of the frequency spectrum and by providers waiting until more competition is in place to increase speed so as to always be just faster than their competitors.17 Governments can create incentives to encourage the entry of more competitors, particularly in Wi-Fi technologies, and help them drive adoption among the population at large.

Pilot projects initially funded by multinational organizations and the government should be expanded to provide connectivity at greater speeds to the broader community. For instance, Jamaica, with the auspices of USAID, has been studying the possibility of adopting the Last Mile Initiative, a global program to expand the access of communications to a wider scale of the population in emerging markets. One of the components of this program is the innovative deployment of low-cost technologies, such as Wi-Fi and Wi-Max, in remote communities and SME firm networks.

These technologies, however, are usually adopted by the larger and more efficient firms first, and then replicated through the economy. Thus, it is important to quickly develop and implement regulatory reforms, incentives for new competitors and SME firm networks.

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These technologies, however, are usually adopted by the larger and more efficient firms first, and then replicated through the economy. Thus, it is important to quickly develop and implement regulatory reforms, incentives for new competitors and SME firm networks.
2. Improve Ability. A key input for improving the region’s competitiveness is the upgrading of knowledge and human capital. In this sphere, the Caribbean considerably lags in relation to any developed country. This should become an immediate priority for governments since it is well known that any investment in upgrading intangible assets requires both practice and patience over the long-term to fully materialize and translate into improved productive capacity of a country. First, the gap in tertiary education is worrisome. While primary and secondary enrollments are in line or in some instances above other developed countries, enrollment rates at the university level are less than 10 percent in almost every country (except for the Dominican Republic, Barbados, and Bahamas that have upwards of 20 percent enrollment). In response to this, governments have created a series of programs and technical schools. They have also made program accreditation easier and courses more flexible. These are efforts in the right direction; yet, businesses still point to difficulties in getting the right local skill set for their businesses. Some highlight deficiencies in general managerial and marketing skills as stated by the CEO of Gale Force Windows in Antigua: “We don’t have a problem recruiting for our factory and providing training. What we need are managers that can open new markets, and interact with our customers to create new opportunities for the business.” Others say the skills gap is especially prevalent in more complex IT jobs, as well as data processing and software development and maintenance. The chief operating officer of an Internet gaming company notes: “We are obliged by law to hire locals at a ratio of 3:1, while that is not a challenge given our competitive pay, the real experts in IT and gaming are coming from the UK and Australia.”

In this sphere, there is a clear role for government and private sector organizations to provide targeted support.Governments should support private training schemes by providing well-designed training incentives for firms through fiscal incentives, matching grants or subsidies as appropriate.18 Furthermore, governments and international donors should support training agencies that provide demand-driven programs and prove to have private sector linkages. These linkages can be created through internships and exchanges that bring back relevant market knowledge into the classroom. Private sector organizations and trade associations can also spearhead these efforts by working in conjunction with the government to make training relevant to the labor market and to inform small and medium enterprises (SMEs) of the training options available to them. For example, a call center in St. Lucia spent over US$10,000 for a specialist to train its staff. This type of training could be organized by trade associations to encompass more players and spread out the costs.

Local universities need to connect to the needs of the private sector to understand the demands on future employees and to engage in applied research. Currently, most of the successful businesses are led by Caribbean people who have returned after receiving advanced degrees or have job experiences abroad.19 More partnerships, like the one spearheaded by the Dominican Republic’s government, local universities, and New York’s Stevens Institute, need to be replicated to improve the quality and applicability of local degrees. Applied science and technology need to be more relevant parts of tertiary education and vocational training. Government institutions and international donors can help mediate these partnerships and sponsor conferences to share and price advancements in areas of science and technology. One of the major challenges in the Caribbean is extending training to smaller and medium-size firms that currently are much less likely to use formal training. Small firms are more constrained by resources, lack of knowledge about training and its benefits, and labor turnover than are larger firms.20 There is a rationale for support private training schemes by providing well-designed training incentives for firms through fiscal incentives, matching grants or subsidies as appropriate.18 Furthermore, governments and international donors should support training agencies that provide demand-driven programs and prove to have private sector linkages. These linkages can be created through internships and exchanges that bring back relevant market knowledge into the classroom. Private sector organizations and trade associations can also spearhead these efforts by working in conjunction with the government to make training relevant to the labor market and to inform small and medium enterprises (SMEs) of the training options available to them. For example, a call center in St. Lucia spent over US$10,000 for a specialist to train its staff. This type of training could be organized by trade associations to encompass more players and spread out the costs.

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the government to subsidize firms that provide on-the-job training for general skills, or to subsidize private training facilities that offer general training. Regional certification boards can also improve and harmonize regional standards in ICT technical degrees to international standards. Companies like Gale Force Windows applied to receive subsidized training from ex-Canadian International Development Agency (CIDA) technical support services in St. Lucia, but were denied for unknown reasons. They wanted to train key personnel on back end IT systems so they could connect their factory to their accounting and sales offices, but could not afford to do so on their own.

Country-specific analysis should be performed to identify any externalities that may impede effective training (information, financial, labor turnover, etc.) to arrive at sound training policy design. However, a general finding of this report is that small and medium-size firms should be the primary targets for incentives to encourage training.

3. Support Services for Firms. The availability of support services and financing for startups, particularly in technology-based businesses, is almost non-existent in the region. The failure to deliver funds and technical capabilities to small ventures is the largest impediment for their growth. A conservative banking sector and exorbitant interest rates contribute to the situation. For instance, most SMEs surveyed in this study raise funds through traditional commercial bank loans, where they face upwards of 12 percent interest rates and in most cases require 100 percent collateral. This calls for the development of higher forms of financial intermediation and venture capital to develop long-term securities, subordinate debt, and equity. Although this is a problem faced by the broader developing world, there are some interesting initiatives in the Caribbean worth noting.

Jamaica has begun a business incubator, the Jamaica Technology Innovation Center (TIC), which hosts 26 technology businesses, providing marketing and management services and modern communication facilities. Although a business incubator’s core competency is not in providing access to finance, they can be a potent mechanism for intermediating venture capital and establishing networks of investors. To this end, the TIC is trying to establish an Angel Investment Network to help start-ups gain access to funds. This growth investment fund will typically consist of high net-worth individuals that want to provide seed capital to emerging companies. For instance, Jamaican/Canadian billionaire Michael Lee Chin has recently pledged a US$1 million contribution to be disbursed to the institution over the next five years. This strategy is worth analyzing, given that the Caribbean Diaspora communities in North America and Europe could become a potent force for new venture financing in the region.

Furthermore, incubators can help nurture new enterprises in their most vulnerable phase until they “graduate”—that is, they are financially viable and freestanding to leave the incubator. To do so, however, there are some guidelines that should be followed so that they do not constitute the next IT fad in the region. First, although the most common sponsors of business incubators are academic institutions and government agencies, research suggests that the less an incubator relies on subsidies the more successful and viable it is. This calls for a clear strategy of how the incubator will reach financial sustainability both by providing services to in-house startups, and training and consulting services to other private and public sector firms. As incubators move towards this path of financial viability, it is typical that their budget moves away from being almost 50 percent provided by government or multilateral organizations, to almost full reliance on its own revenue-generating activities. Second, incubators should draw a clear line between financial intermediation and providing direct financial assistance to firms. The former is their actual role and they should try to set up networks of potential investors that can help raise startup capital. Finally, the incubator should have clear and unfailing performance to the government to subsidize firms that provide on-the-job training for general skills, or to subsidize private training facilities that offer general training. Regional certification boards can also improve and harmonize regional standards in ICT technical degrees to international standards. Companies like Gale Force Windows applied to receive subsidized training from ex-Canadian International Development Agency (CIDA) technical support services in St. Lucia, but were denied for unknown reasons. They wanted to train key personnel on back end IT systems so they could connect their factory to their accounting and sales offices, but could not afford to do so on their own.

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metrics and success criteria for selecting companies, and for them to "graduate."

Another area for SME support is technical assistance, particularly as it relates to the use of ICT in transforming business processes. Technical assistance is in some cases easier to channel, since financing sometimes lends itself to different pressures and can become concessional in nature in some developing countries. Government-funded SME support agencies are rare in the Caribbean and those that exist tend to lack the strategic vision, resources, autonomy and linkages with successful firms to promote private sector development with an ICT edge. For example, Trinidad established three institutions to support the private sector. However, they remain disconnected from the needs of firms and lack the technical capabilities and entrepreneurial expertise that are required to uphold the legitimacy of such institutions. As a case in point, the National Entrepreneurship Development Company Ltd. (NEDCO) is perceived as an instrument of political patronage or as a social development program of income redistribution. On the other hand, organizations like the Centro de Apoyo a la Micro, Pequeña y Mediana Empresa (CAMPES) in the Dominican Republic that provide market information on numerous industries, and legal and financial advice for local businesses are important for fostering entrepreneurship. For best results, these organizations need to have (i) a clear mandate and strategic vision, (ii) the in-house technical capabilities to execute on that mandate, (iii) private sector involvement and personnel with entrepreneurial expertise to bring forth institutional legitimacy and strategic guidance, and (iv) performance metrics to assess an agency's successful interventions with the private sector.

Regional trade associations could also help, not only in aggregating supply and stimulating demand (collective marketing, training, market research, etc.), but also in providing knowledge resources on how the sector could improve performance and utilize ICT. Although most of these organizations are not active and their use of ICT is predominantly through "static" websites with entry forms, some, like the Caribbean Tourism Organization (CTO) are more dynamic in this regard. The CTO has a Management Information System for Tourism (MIST) and an Intranet/Extranet that serves as an important catalyst to the advancement of technology platforms within this sector and as powerful market research tools for smaller firms. Cluster-based initiatives funded by donors, governments, and the private sector organizations can improve the competitiveness of a sector through collective initiatives that upgrade the clusters' products and services. These initiatives often involve improved technology platforms incorporated by the cluster as a whole, as seen by the Bermuda Escapes project that used a common back-end IT system to track and tailor tourists' experiences.

4. Regional Harmonization in Key Policy Areas Related to ICT

As more people turn to ICT to do more of their day-to-day operations, it is imperative that legislation is kept attuned to ICT and its use. The more legislation is harmonized in the region and compatible with international standards, the greater the benefit to these economies and their attractiveness to foreign investors. Priorities in this area include the legal enforcement of electronic documents; protection of intellectual property and privacy; further liberalization of telecommunication markets; development of a framework to support electronic transactions; and enforcement of electronic documents and contracts. Laws on intellectual property as they relate to the Internet—code, data, music, or other content have important implications for businesses selling into a multi-jurisdictional world. Keeping abreast of these changes and providing up-to-date, enforceable legislation will affect the region's ability to transact with and attract foreign businesses. Mauritius for example, has been a leader in this realm in Africa and has convinced Microsoft, Hewlett Packard, and IBM to set their regional headquarters in the island.

Regional trade associations could also help not only in aggregating supply and stimulating demand (collective marketing, training, market research, etc.), but also in providing knowledge resources on how the sector could improve performance and utilize ICT. Although most of these organizations are not active and their use of ICT is predominantly through "static" websites with entry forms, some, like the Caribbean Tourism Organization (CTO) are more dynamic in this regard. The CTO has a Management Information System for Tourism (MIST) and an Intranet/Extranet that serves as an important catalyst to the advancement of technology platforms within this sector and as powerful market research tools for smaller firms. Cluster-based initiatives funded by donors, governments, and the private sector organizations can improve the competitiveness of a sector through collective initiatives that upgrade the clusters' products and services. These initiatives often involve improved technology platforms incorporated by the cluster as a whole, as seen by the Bermuda Escapes project that used a common back-end IT system to track and tailor tourists' experiences.

Another area for SME support is technical assistance, particularly as it relates to the use of ICT in transforming business processes. Technical assistance is in some cases easier to channel, since financing sometimes lends itself to different pressures and can become concessional in nature in some developing countries. Government-funded SME support agencies are rare in the Caribbean and those that exist tend to lack the strategic vision, resources, autonomy and linkages with successful firms to promote private sector development with an ICT edge. For example, Trinidad established three institutions to support the private sector. However, they remain disconnected from the needs of firms and lack the technical capabilities and entrepreneurial expertise that are required to uphold the legitimacy of such institutions. As a case in point, the National Entrepreneurship Development Company Ltd. (NEDCO) is perceived as an instrument of political patronage or as a social development program of income redistribution. On the other hand, organizations like the Centro de Apoyo a la Micro, Pequeña y Mediana Empresa (CAMPES) in the Dominican Republic that provide market information on numerous industries, and legal and financial advice for local businesses are important for fostering entrepreneurship. For best results, these organizations need to have (i) a clear mandate and strategic vision, (ii) the in-house technical capabilities to execute on that mandate, (iii) private sector involvement and personnel with entrepreneurial expertise to bring forth institutional legitimacy and strategic guidance, and (iv) performance metrics to assess an agency's successful interventions with the private sector.

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Ideally, the Caribbean should proceed in these reforms as a regional block. Alternatively, smaller country groups such as the OECS can proceed in tandem if it speeds up the process. To date, the Organization of Eastern Caribbean States (OECS) and the Caribbean Single Market and Economy (CSME) have taken important steps in some of these areas. The advantage of this regional alternative is twofold. First, it constitutes an immediate step towards regional harmonization of practices and legislation, which by default, will most likely guarantee international compatibility in e-practices and attempts at replicating best-practices (for instance in telecommunications regulation). Second, it allows individual governments to move more swiftly in the reform process, as each country focuses on facilitation and execution rather than on drafting country-specific legislation. For instance, an OECS Telecommunications Reform II Project is being drafted to expand the reach of the first OECS Telecommunications Reform Project and tackle some of the persistent telecom regulatory challenges in the region. Specifically, the new project is expected to build on the reform agenda and set clear guidelines to move forward along two key components:

- Bolstering support for legal and regulatory reforms that are presently underway, such as the establishment of a dispute resolution mechanism for private operators; outlining of policies and procedures for interconnection issues; and capacity building and training to strengthen the Telecommunications Authority and the Spectrum Managing and Monitoring System (SMMS).
- Reviewing the current Universal Access Policy and establishing a Universal Access Fund (UAF) to uphold it.

Looking forward, one of the major challenges and, if instituted, one of the new project’s major accomplishments would be the design and implementation of regulation for interconnection-pricing-physical interconnection and interfacing fees (especially fixed-to-mobile interconnection fees and mobile-to-fixed call termination charges). Interconnection pricing must cope with two problems: the market power of local access carriers in termination charges25 and the incentive of the incumbent not to offer interconnection to entrants (or to provide technically inferior connection between its facilities and the facilities of a competitor).26 Hence, the goal of the new telecom reform project’s interconnection pricing scheme is to determine a modern cost methodology and an interconnection regime that diminishes the incumbent’s market power, lowering costs and increasing competition.

In the case of the CSME, model legislation is being drafted in competition law, consumer protection and anti-dumping and countervailing measures.27 But other important issues such as intellectual property and e-enabling legislation (e-commerce regulation, electronic signatures, Internet banking and transactions and Internet crime) have not been tackled at a regional level. The CSME should extend its reach to these areas, and donors can support these institutions in prompt implementation and regional harmonization in these topics.

As the CSME proceeds as a block, it is also important that regulators be trained in technical aspects and participate in international ICT/telecommunications workshops to remain informed of the latest trends in international

### Promoting Knowledge Exchange

Norway has been at the forefront of e-legislation. For instance, the Norwegian government has put in place an initiative to use digital signatures in electronic interaction with and within public administration. Furthermore, Norway is sharing its initial success with developing countries in its relations to legislation. The Norwegian Agency for Development (NORAD) in partnership with UNDP has worked in countries such as Bosnia to support the development of e-legislation. For example, people from the public and private sector in Bosnia have participated in study trip exchanges to Norway to review best practices in e-legislation and other (e)related fields.28 Such knowledge exchanges can be easily replicated in the Caribbean and hold important potential.

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standards, and appropriately customize them to the region’s challenges. This is an area where donors can help, connecting networks on the subjects and encouraging the transfer of knowledge in these fast-moving topics.

Tapping into developed nations that have implemented model legislation successfully is the best way to proceed. Organizations like the Internet Corporation for Assigned Names and Numbers (ICANN) and ITU can provide guidance on the latest standards. As these changes happen, it is important that consumers and the private sector are kept abreast of what this means for their businesses, particularly as it pertains to their legal rights and responsibilities.

5. Technology Clusters Must Make Business Sense. High technology clusters do offer the potential for positive spillover in the Caribbean. This potential is, however, extremely limited and has to date been heavily underestimated at significant costs. For instance, as call centers became a fad throughout the Caribbean, investments were often not analyzed in a rigorous manner. Despite the use of basic technologies (telephony), many foreign companies demanded generous concessions from government, promising more complex technology spillover effects and employment generation. Perhaps most importantly, the sponsors of basic telemarketing call centers misunderstood the upward cycle they were trying to create. Call centers alone are akin to maquila labor in textiles. The primary attraction is cheap rates (both on financing and especially on labor). An industry, disconnected from the importation of sophisticated software programs. Second, in these arrangements the call center employees become part of the outsourcing company, improving motivation and reducing turnover rates. Finally, large companies and their clients tend to have more contact with their customer service operations offshore and many often visit call center premises on a regular basis.

Many Caribbean nations have also experimented with FTZs and Cyber Parks to attract foreign direct investment (FDI) and facilitate technology transfer and other positive spillover effects. However, as the case of Antigua FTZ and the Dominican Republic’s Cyber Park indicate, very seldom do the promised effects materialize. In many cases, the international demand for these services to be offered in such locations did not exist. These failures illustrate that these new investments need to make business sense, be demand-driven and be guided by a carefully assessed strategic intent. For instance, the longer the commitment required by the foreign businesses and the greater the need for their close interaction with the local workforce and businesses (through specialized training, procurement of inputs and raw materials, etc.) the more the spillover effects can be realized. These spillovers range from positive externalities in training and human capital, to the adoption of technology and more efficient business processes. Academic studies that have attempted to quantify these externalities have produced mixed results, but all point to the importance of establishing links with the local economy as the key determinant of success. Otherwise, very little is left behind when foreign investors exit the economy.

There are some viable opportunities in the call center business if the Caribbean can re-enter at the high end of customer service for large/well-known U.S. companies, instead of continuing with the low-cost telemarketing model. The advantage of higher-end customer service accounts is three fold. First, customer service accounts guarantee long-term contracts (2 years plus) because the outsourcing company has to make greater commitment in training and development for the call center employees. Training in this sort of arrangement is more holistic, not only focusing on customer service skills, but also on company-specific products, policies, and procedures, and involves more sophisticated software programs. Second, in these arrangements the call center employees become part of the outsourcing company, improving motivation and reducing turnover rates. Finally, large companies and their clients tend to have more contact with their customer service operations offshore and many often visit call center premises on a regular basis. Many Caribbean nations have also experimented with FTZs and Cyber Parks to attract foreign direct investment (FDI) and facilitate technology transfer and other positive spillover effects. However, as the case of Antigua FTZ and the Dominican Republic’s Cyber Park indicate, very seldom do the promised effects materialize. In many cases, the international demand for these services to be offered in such locations did not exist. These failures illustrate that these new investments need to make business sense, be demand-driven and be guided by a carefully assessed strategic intent. For instance, the longer the commitment required by the foreign businesses and the greater the need for their close interaction with the local workforce and businesses (through specialized training, procurement of inputs and raw materials, etc.) the more the spillover effects can be realized. These spillovers range from positive externalities in training and human capital, to the adoption of technology and more efficient business processes. Academic studies that have attempted to quantify these externalities have produced mixed results, but all point to the importance of establishing links with the local economy as the key determinant of success. Otherwise, very little is left behind when foreign investors exit the economy.
before investments begin. Investment Promotion Agencies, along with the government and the private sector, need to have a vision of the country’s growth strategy and work together to execute it.

6. Strengthen New Service and Niche Manufacturing Clusters. Technology can and must be a fundamental enabler of high potential clusters of existing Caribbean businesses, such as tourism. This is an essential and largely under-appreciated imperative.

First and foremost, public and private sector partnerships should be created to attract investment in promising sectors such as wellness and rehabilitation centers, high-end tourism and yachting, stem cell research, virtual financial headquarters, medical devices, niche agribusiness clusters, etc. This requires the articulation of a coherent and coordinated industry-wide strategy for those targeted clusters that have the greatest potential for growth. In doing so, there is a clear role for government and the private sector. The private sector, through industry associations or business development institutions, needs to incorporate those industry goals and facilitate collaborative initiatives that improve access to crucial inputs (training, targeted technical assistance). In doing so, they can also lobby the central government for particular infrastructure and/or institutional improvements and education and training initiatives required to push forth a sector’s new vision for the future.

Governments can support these organizations by funding feasibility studies, facilitating the emergence of agencies in nascent but promising industries, and implementing the necessary legislation to support their growth. Furthermore, credible private sector institutions or regional trade associations should act as a crucial role to play in countries where ICT businesses are nascent but promising. The government should help publicize, reward, and disseminate successful entrepreneurial activity to give Caribbean people the sense of possibility. This is the idea to move away from a state of complacency where government is seen as the caretaker, to one focused on cooperation as the force that spurs innovation, human initiatives, learning, interpersonal trust, and cooperation triumph.³⁰
1. COMPETITIVENESS AND ICT

1.1 IMPERATIVES FOR CHANGE

As markets liberalize and advances in information technology change the nature of communication and competition, the most successful governments develop strategies and institutions that not only manage the effects of these global trends, but also leverage them for increased effectiveness. At the same time, the most successful businesses, the economic engines of a nation, have been those that have been able to integrate ICT into their operations to create sustainable and defensible strategies to deliver complex products to demanding customers.

Companies in much of the Caribbean have succeeded in the past by managing a few relationships and taking advantage of trade preferences in commodity markets. The rules of competition are changing and, increasingly, sustained advantages are created by managing and understanding one’s customers and their needs.

In a globalized world, competitors cannot hide in protected markets. Eventually, all firms will face competitive pressures at home, even if they choose not to sell abroad. To be prepared to meet and beat the competition, firms must be capable of exporting. For reasons of scale and sophistication, the small economies of the Caribbean demand that leading firms export, and be able to do so without distorting trade preferences and subsidies.

The definition of a competitive firm is one that has the ability to sell a product or service to demanding customers for a profit over a long period of time. Companies that succeed in the 21st century do so by embedding unique insights about their customers’ needs and preferences into the products that they produce. This does not only mean that companies must produce premium niche products (although that is the best route for most Caribbean companies). It does mean, however, that each company must be differentiated either in its offering, its relationships, or its processes.

ICT can provide existing companies and new entrepreneurs an opportunity to engage in, and manage, the new dynamics of the global marketplace. Most important, ICT offers the opportunity for firms to learn from the best in the world, at a keystroke. ICT, used correctly, can level the playing field. “Going high tech”, however, does not in and of itself make a firm competitive. ICT are tools that are as effective as the strategies driving their use.

While many studies have been done to determine access and ability to use ICT, the goal of this study is to focus on how the adoption of ICT has or has not created the productivity improvement necessary for sustained growth. We also dissect some of the ICT pilot projects that have been tried throughout the region to better understand the sources of success or failure. infDev plays a unique role in providing research on ICT to inform policy and projects led by members of the multilateral community. Following their mandate, the explicit recommendations coming out of this analysis will be directed towards governments and multilateral organizations seeking to take a progressive role in strengthening ICT in firm-level competitiveness and improving growth.

Access

Much has been written about access (or the lack thereof) and the digital divide (the growing gap in the ability to leverage technologies by the sophisticated few versus the unsophisticated many – between and within countries). Certainly, ensuring reasonable access and bridging the digital divide are essential.

There are other analyses that study these issues extensively. We have cited many of these, in particular to provide an understanding of where the Caribbean nations fall along these yardsticks. However, much of this work will be found in appendices to this report for two important reasons:

- This topic has been covered elsewhere, by others who have more expertise in this area than we, and;
- Our primary goal is to shift the conversation from one of universal access to one of enabling technologies for high potential clusters.

Universal access is an important and worthy goal. However, this goal has not been achieved in any country, so it is difficult to tie this to specific ICT can provide existing companies and new entrepreneurs an opportunity to engage in, and manage, the new dynamics of the global marketplace. Most important, ICT offers the opportunity for firms to learn from the best in the world, at a keystroke. ICT, used correctly, can level the playing field. “Going high tech”, however, does not in and of itself make a firm competitive. ICT are tools that are as effective as the strategies driving their use.

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Universal access is an important and worthy goal. However, this goal has not been achieved in any country, so it is difficult to tie this to specific
productivity improvements. We posit that the short and medium term limits test for connectivity ought to be the ability of the average businessperson to access the Internet and speak on the telephone (domestically and internationally) with reasonable reliability and at reasonable cost. The long-term limits test is the ability of the average citizen to access these same services, but that is outside the scope of our analysis.

It is important to note, however, that the various analyses of the region come to similar conclusions. Access in the Caribbean is improving, but telecom monopolies and small markets lead to exorbitant prices. Adoption is lower and less reliable than one would hope, with obvious variations between countries.

Access can be achieved with fixed phone lines or cell phones, Internet telephony or satellite. Costs can be reduced through open competition, government subsidies, or alternative technologies. Our task in this report is to highlight the relative starting points in the Caribbean, and to provide potential solutions. But this is meant primarily to support the broader economic growth objectives of this report, not as an end in itself.

We will therefore look at access, ability, and the business environment in the diagnostic section of this study to understand what firms and institutions require from the enabling environment to reap productivity gains from ICT tools. Our most important recommendations in this realm will be tied to gaps experienced in the productive sector, rather than looking at access and ability indicators in isolation.

**Horizontal vs. Vertical ICT Sectors**

An important distinction we make in this study is between ICT vertical sectors that focus on the development of direct ICT products and services (Business Process Outsourcing services, Call Centers, software development, etc.) and ICT as a platform and enabler (horizontal) for the larger economy (through infrastructure development, reduced telecom costs, e-commerce, etc.) that lead to firm-level improvements in productivity. Most industrial and service clusters can benefit from the incorporation of ICT and that is an angle that is harder to isolate and measure. These two are commonly conflated when assessing the impact of ICT.

The cluster is a natural group of organizations that need to communicate with one another, and is an important platform and enabler (horizontal) for the larger economy (through infrastructure development, reduced telecom costs, e-commerce, etc.) that lead to firm-level improvements in productivity. Most industrial and service clusters can benefit from the incorporation of ICT and that is an angle that is harder to isolate and measure. These two are commonly conflated when assessing the impact of ICT.

**1.2 THE CLUSTER AS THE APPROPRIATE LEVEL OF ICT INTERVENTION**

The ultimate objective of any ICT initiative in the region should be to grow Caribbean economies through the appropriate use of ICT. Therefore, we must focus our efforts at the industry or cluster level, where economic impact can occur. Organizations – primarily private firms, supported by ministries and/or NGOs – are where economic value is created. Firms and institutions do not operate alone. They work together to produce products and services, and depend on one another to supply their inputs and buy their products and services. Additionally, these organizations depend on services such as transportation and packaging. A cluster is a combination of all these organizations, which need to coordinate their activities to create value for the final consumer.

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The former is usually the one vastly publicized in the news as progress in the move into “high-tech,” especially when industries are created from scratch. This study will focus on understanding ICT from each of these two perspectives which, together, will allow us to assess the holistic impact of ICT on the Caribbean.

Broadly speaking, we believe that vertical ICT clusters have been over-relied upon and have largely failed to live up to expectations. There are some good reasons for this, particularly the choice of low-wage-centric clusters such as call centers, and the failure to link foreign investment to local skills and generate spillovers. Choosing more wisely and implementing in a more locally appropriate fashion can offer potential (such as data modeling for the energy industry in Trinidad and Tobago). But this potential is limited.

We will offer analysis of what has worked (Caribbean and elsewhere) and what has not (Caribbean). Largely, however, our conclusions are that these sectors have been too heavily emphasized, to the detriment of existing clusters that can greatly benefit from increased ICT applications.

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important focus for ICT for two reasons. First, it allows ICTs to focus interventions on a large number of small organizations at once, multiplying their impact. Communicating throughout the value chain to the final consumer improves efficiency and helps creating customer loyalty. ICTs offer great potential for ICT to improve efficiency and create customer loyalty. ICTs offer great potential for ICT to have a significant economic impact. But a much greater economic impact can be created by applying ICT to a cluster of firms that must work together and communicate to succeed.

When are ICTs (part of) the Answer?

Most developing countries and development partners now understand that ICT has a critical role to play in enabling this transition to high value added products and services, and thus accelerating the process of economic development. Phenomenal amounts of funding and effort have been put toward ICT infrastructures and service provision, but success requires more than the provision of services. To realize the promise of ICT requires not simply the adoption of ICT, but the usage of ICT to improve productivity. If funds are invested in ICT to drive adoption without demonstrable returns in productivity and wealth, the countries will fall further behind the world in terms of productivity and efficiency, and the future investments in ICT will be harder to justify in light of a negative track record.

When analyzing the role of ICT, the question must always go back to the final goal-building competitive advantage—and measuring progress made by institutions toward that goal with the use of ICT. Our premise is that Caribbean economies must move away from commoditized goods and services to high-value added and differentiated products and services. Most companies in the Caribbean are still competing based on comparative advantage that hinges on the quality of inputs available in a country: labor, capital and natural resources. Thus, they compete by undercutting each other in terms of labor costs or by exploiting and creating vulnerability in their provision, but success requires more than the provision of services. To realize the promise of ICT requires not simply the adoption of ICT, but the usage of ICT to improve productivity. If funds are invested in ICT to drive adoption without demonstrable returns in productivity and wealth, the countries will fall further behind the world in terms of productivity and efficiency, and the future investments in ICT will be harder to justify in light of a negative track record.

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Even when seeking to apply an ICT to a promising cluster opportunity, three keys to success must be considered:

- **Access**: Does the recipient organization have access to the infrastructure to use the ICT in question? Factors that affect access are availability of services such as electricity, telephone, cellular and satellite. Access factors are still important determinants in the Caribbean because of the high prices on telephony and Internet access demanded by the regional monopoly, and the regulatory restrictions on other competitive options for connectivity. Note: access is not an end in itself but a means to a specific utility.

- **Ability**: Does the intended beneficiary have the appropriate skill set to leverage the technology being applied? Willingness of the organization to pay for ICT services is an ability factor, as is the level of education and technology training of an organization’s employees. In the Caribbean, ability is a mixed bag; literacy rates and primary schooling show promising indices, as well as pilot projects bringing computers to schools. However, there is still a lag in skilled IT labor, and most of the decision makers at the top of organizations (both public and private) do not understand the inherent transformations necessary to benefit from these technologies.

- **Benefit**: Does the project increase competitive advantage, even after accounting for its costs? Measuring the impact of ICT is not easy in developing countries. ICT investment has been linked to growth in Total Factor Productivity. When looking at ICT in developing countries, this methodology is difficult to apply because the information is not readily available, and ICT might not have trickled through the economy sufficiently to track its influence. However, there are indicators that can explain how and if ICT is having an important impact on improving competitiveness, at a firm and institutional level. In analyzing the benefit of various initiatives, we use two main parameters:

  1. **Productivity Improvements**: Has the use of ICT increased efficiency and/or reduced costs? ICT can be a fundamental tool in improving productivity by facilitating logistical improvements through faster and more efficient communication along the value chain. It can also make distances irrelevant, particularly on more value added digitized products and services. In a service economy, the ability to provide services faster and in a more customized way, will become norms of competition. Improving transparency through the universal availability of information can also improve the costs of doing business and strengthen institutions.

  2. **Creating Differentiation**: Will the firm/institution use technology to enter new niche markets, innovate and differentiate their products or processes? Have ICT allowed them to provide a differentiated product to new and more profitable global clients? The ability to communicate with your customers, faster and more intently with ICT allows companies to customize their offerings to achieve a competitive edge. ICT also makes available information about competitors and clients beyond your borders to understand your competitive positioning and adapt the market forces.

These two measures of benefit, productivity and differentiation, are not mutually exclusive, nor comprehensively exhaustive. They provide a good indication of how firms, the engines of an economy, are transitioning into more competitive positioning with the use of ICT. A good parameter of improvement on these two fronts is salary levels in key industries. As ICT allows for productivity improvements and differentiation, companies need to pay workers more, as they require higher skill levels. High wages reflect a firm’s investment in human capital, and its dependence on innovation for improved performance. This measure can be deceiving in the region, given the inflow of aid, the relative scarcity of skilled labor, inflexible labor markets and government subsidies maintaining artificially high salary levels. Where applicable, case studies will make comparisons among wages in ICT-enabled businesses compared to others in the economy.

Each of these keys is necessary for ICT initiatives to succeed, and they must be considered simultaneously.

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34 The World Bank’s (2004) “Contribution of Information and Communications Technologies to Growth” by Zhen-Wei Qiang, Pitt A. and Ayers S., analyzed the impact of technology in Total Factor Productivity in developed economies. Total Factor Productivity is defined as the output growth minus the growth rates of capital and labor inputs, weighted by their contributions to output. This study has proven the positive results across Western Economies especially the US have accrued from investment in ICT.

If we are to increase ICT Usage, in many respects, the appropriate technology will differ depending on the industry, the position of the user in the value chain, the type of product and service offered, etc. This framework is useful to remind us the limits of looking at access and ability metrics in the absolute. Comparing literacy rates or number of Internet users will provide negligible inputs on policy prescription, if they are not tied to the benefits being sought. Competition is about success relative to the market; ICT initiatives must therefore be evaluated in the same light.

**FIGURE: The Keys to Increasing ICT Usage**

- **Access**
  - Electricity
  - Telephone access
  - Cell Phone access

- **Ability**
  - Education
    - Primary/secondary
    - Tertiary
    - Specialized training

- **Benefit**
  - Value of using ICT
    - Productivity
    - Differentiation/innovation
    - Quality of life
  - Productivity
  - Differentiation/innovation
  - Quality of life

Source: Eastern Caribbean Central Bank
2. DIAGNOSTIC: HOW THE CARIBBEAN COMPETES TODAY

2.1 CARIBBEAN COMPETITIVE LANDSCAPE: OPPORTUNITIES AND CHALLENGES

The following section outlines the competitive landscape for Caribbean countries. Since the microstates of the ECS face particular challenges as compared to the broader Caribbean region, they are analyzed independently.

Eastern Caribbean States

The Eastern Caribbean States (ECS) face considerable development challenges due to their small size and their vulnerability to external conditions. Growth rates were high between 1986 and 1989, averaging more than 6 percent per year. But those rates declined during the 1990s. Real growth rates dropped down to an average of 2 percent per year. Some economies, such as Dominica and more recently Grenada, have experienced negative growth due to this year’s natural disaster (refer to Appendix 5, Table 3.2 and 3.3).

Most of the favorable conditions that led to the stellar performance from 1986-1989 have been reversed. The expansion of agricultural production due to trade preferences and favorable exchange rate movements is now being reversed. The boom in tourism, which now accounts for more than half of the Eastern Caribbean States’ (ECS) earnings, suffered a considerable decline since 2001 due to adverse global economic conditions, and is only recently recovering. Finally, the offshore financial and business services have recently come under international scrutiny. Pressure to strengthen their regulatory infrastructure, as well as to reduce their “harmful” tax competition, is causing an overall decline in the growth of this sector (see figure below).36

Given this competitive landscape, it is imperative that ECS countries pursue a more aggressive strategy of economic diversification—not necessarily into new industries, but away from the low-cost,  

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37 Ibid

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Growth Rate of the Tourism and Banking Sectors in the ECS (1995-2002)
low-value models. In essence, there are two broad patterns in the ECS in terms of sectoral composition as depicted by the following figures. One is exemplified by islands such as Dominica, Grenada and St. Vincent, and the Grenadines with relatively large agricultural, service and government sectors. The other is depicted by Antigua, St. Kitts and Nevis and St. Lucia that hardly have any agriculture but are also heavily reliant on services and government. In the first group of islands the agricultural sector is still of relative importance and represents anywhere from 8-15 percent of the country’s GDP. However, the future prospects for this sector are extremely challenging due to increased trade liberalization in both banana and sugar production.

The service sector accounts for more than 60 percent of GDP across all ECS. A closer look at the composition of the service sector sheds light on some interesting patterns across the ECS. As depicted below, the entire region heavily relies on the public sector as a source of growth and employment, as is evidenced by the significant share of government services. The service sector is dominated by services such as wholesale and retail trade, banking and insurance, transportation, hotels and restaurants, communications, real estate and housing, and other services and utilities.

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Caribbean text 2-27.qxd  2/27/07  12:40 PM  Page 26
by the government's share of GDP that stands at an average of 15 percent of total output. Most of this growth has been largely due to public sector investment programs in these countries. Wholesale and retail trade, which primarily constitute the reselling of imported goods such as food, clothing, and light manufacturing, are also of relative importance across the ECS given that these islands are net importers of consumption goods. Banks and insurance are also drivers of economic activity in these countries (representing in most countries more than 8 percent of GDP), but as mentioned previously, some islands have suffered from greater international scrutiny in their banking practices, which has affected the growth of this sector in recent years. The hospitality segment plays a dominant role in countries such as Antigua, St Lucia, Grenada, and St Kitts and Nevis, and growth is not only driven by expenditures in hotels and restaurants, but also through complementary investment in real estate, transportation, etc. Despite this, some countries have seen a recent deterioration in the economic benefits of this sector as tourist expenditure per day on their islands has dropped in recent years (Refer to Section 4.1 for an analysis of tourism latest trends). This could indicate that ECS are following the wrong type of business model, attracting mass tourism and cruise ships, instead of the more sophisticated and high-spending tourists.

Furthermore, the narrow economic base and consequently the export concentration of these countries in agriculture and very basic manufacturing products place them in an extremely vulnerable position (Refer to Section 2.2 for a further analysis of ECS Trade Statistics).These are commoditized products, aimed at customers who are more concerned about getting the lowest price than about paying a premium for value-added.

**The Broader Caribbean**

The rest of the Caribbean countries covered in this study have had more disparate growth performances and contrasting development challenges than the ECS. For instance, Belize and Trinidad and Tobago sustained growth of 3-4 percent of GDP over the last five years, while others like Haiti and Guyana have exhibited negative or stagnant growth in recent years. Yet, there are countries like the Dominican Republic that was growing at the stellar rate of 7 percent of GDP from 1996 to 2000, but has recently by the government's share of GDP that stands at an average of 15 percent of total output. Most of this growth has been largely due to public sector investment programs in these countries. Wholesale and retail trade, which primarily constitute the reselling of imported goods such as food, clothing, and light manufacturing, are also of relative importance across the ECS given that these islands are net importers of consumption goods. Banks and insurance are also drivers of economic activity in these countries (representing in most countries more than 8 percent of GDP), but as mentioned previously, some islands have suffered from greater international scrutiny in their banking practices, which has affected the growth of this sector in recent years. The hospitality segment plays a dominant role in countries such as Antigua, St Lucia, Grenada, and St Kitts and Nevis, and growth is not only driven by expenditures in hotels and restaurants, but also through complementary investment in real estate, transportation, etc. Despite this, some countries have seen a recent deterioration in the economic benefits of this sector as tourist expenditure per day on their islands has dropped in recent years (Refer to Section 4.1 for an analysis of tourism latest trends). This could indicate that ECS are following the wrong type of business model, attracting mass tourism and cruise ships, instead of the more sophisticated and high-spending tourists.

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seen growth drastically weakening to -0.4 percent in 2003. This can be accounted for by the differing composition of their various economies. However, the backdown of this recent performance is the fact that growth has stagnated in some of these countries’ most important economic activities. Further growth spurts through the expansion of tourism and banking is uncertain and the manufacturing sector is still narrowly focused in commoditized products.

Although the service sector has taken over manufacturing as the primary sector (agricultural and mining), its relative importance varies across countries (Refer to figure below). In all the mainland countries (Belize, Guyana and Suriname) of this study, agricultural production and mining are significant growth components in GDP and production is still expected to grow. This is primarily due to scale advantages over the smaller islands in the Caribbean that compete in a similar basket of goods. In Guyana, the agricultural sector accounts for almost 30 percent of GDP, with another 10 percent coming from mining (primarily bauxite). This sector has actually grown at an average rate of 3.4 percent since 1999. Bananas, bauxite and alumina account for most of this growth. Finally, agriculture is also important in Haiti, but the outlook is particularly woeful in terms of productivity increases or growth coming from this sector.

Manufacturing and construction also stand high in countries like Dominican Republic and Jamaica. In the Dominican Republic, the decline in economic activity has particularly affected the construction, manufacturing (Free Trade Zones), tourism and financial sectors of the economy. These sectors have seen sharp decreases in their economic activity during the last 2 to 3 years (refer to Figure below); however, tourism and financial services still represent almost 50 percent of GDP. Finally, Trinidad and Tobago is a bit of an anomaly among its neighbors. Since the discovery and industrialization of petroleum five decades ago, the importance of the non-service sector has declined in favor of the energy sector. The oil and gas sector petroleum sector now account for more than 30 percent of GDP. (See figure below).

In aggregate, the service sector accounts for more than 50 percent of GDP across these Caribbean countries (with the exception of Guyana). The figure below provides further insight into its composition. As opposed to the ECS, these countries are not as reliant on public sector goods and services. With the exceptions of Barbados and Suriname, the financial sector has actual grown at an average rate of 3.4 percent since 1998. Likewise, agriculture production in Belize is expected to expand, with citrus and banana production accounting for most of this growth despite the scaling back in 2005 of EU trade preferences. In Suriname, mining and agricultural production have actually more than tripled since 1999. Bananas, bauxite and alumina account for most of this growth. Finally, agriculture is also important in Haiti, but the outlook is particularly woeful in terms of productivity increases or growth coming from this sector.

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this sector represents less than 10 percent of overall economic activity. Wholesale and retail trade are relatively important in countries like Barbados, Belize, Haiti and Jamaica. Banks, insurance, and the hospitality sectors are also the main drivers of economic activity in Barbados, Bahamas, Belize, Dominican Republic, and Jamaica, since they are also represented by complementary investments in transportation, communications, etc.

Despite this, some countries have seen a recent deterioration in the economic benefits of these sectors. For instance, as illustrated in the graph below, growth in financial services has actually deteriorated or stagnated in countries where it represents a sizeable portion of GDP. Jamaica has seen the sharpest decrease in year-on-year growth, primarily due to the continued effects of the 1996 financial sector crisis, although the sector seems to be recovering since 2002 due to improved supervision and regulation in this sector. Most of the broad downturn however, has been the result of consolidation in this industry as opposed to greater international scrutiny in their banking practices as
Governments feel an over-riding sense of behavior commonly encountered in the developing government is one of the patterns of uncompetitive finds itself in good company. In fact, a paternalistic However, in facing these challenges, the Caribbean finds itself in good company. In fact, a paternalistic government is one of the patterns of uncompetitive behavior commonly encountered in the developing world. Governments feel an over-riding sense of responsibility for the success of industries, but historically have been unable to create an environment supportive of sustainable competitive advantages.

2.2.2 ECONOMIC PERFORMANCE AND TRADE STATISTICS

2.2.2.1 Methodology and Theory

A closer look at the Caribbean's economic performance and export flows provides a deeper understanding of the challenges faced by small island economies in devising a strategy for competitive ness and sustained economic growth. By default, the lack of opportunities in these islands for achieving economies of scale, together with their narrow economic base, reinforce the view that the region ultimately has two options to compete. First, most countries in the Caribbean can only profitably

30. Improving Competitiveness and Increasing Economic Diversification in the Caribbean
In the manufacturing or tradable sector by developing and exporting to niche markets where consumers are not price sensitive and products are not based on low labor costs. The second way forward, and one that will become clear after reviewing the region's export flows, is the urgency to further expand into the service sector. The Caribbean countries' most valuable asset is their human capital, which can help them meet the challenge of scalability. In order to do this, some of the rents that are either extracted from agricultural or mining exports, or in other cases provided by the government as a source of income, have to be invested in upgrading the human and knowledge capital of the region. This is a slow process that takes time, patience, and a real commitment by policymakers.

To illustrate trade patterns and export flows, trade charts are calculated for each of the 15 countries of this study and for most countries covers the years 1992 to 2002 (See Appendix 4 for trade charts for all 15 countries). These trade flows are presented in a chart separated by three broad cluster bands that reflect consumption patterns in the economy. As illustrated in the figure below, the first broad cluster band is depicted in the top row and shows upstream-sectors characterized by industries whose primary products are inputs to products in other industries. Most of these industries are resource-based, with the exception of semiconductors/computers and competition is mostly based on costs (i.e. gold, timber, oil, memory chips). Across the middle row are broad, end-use sectors involving industrial or supporting functions. These clusters are centers of complex operations and conduits of innovation and upgrading, characterized by competition based on differentiation as much as costs (i.e. power generators, motor vehicles, and scientific instruments). Finally, the bottom row contains end-use sectors mostly associated with final consumption goods and services. In these sectors, competition mostly centers on product differentiation (i.e. breakfast cereals, clothes, furniture).

The link between these three horizontal bands and productivity upgrading is straightforward. Economies generally begin the upgrading process from initial positions at the top (upstream industries) or the bottom (final consumption goods and services) bands of the trade chart. Resource-rich countries (such as Trinidad and Tobago, Suriname, Guyana, and Jamaica) typically begin at the level of upstream industries, and gradually develop competitive industries in the mid-band (industrial and supporting functions) or the services sector by investing the rents extracted from their resource exports into human and knowledge capital. This process of transformation allows countries to lay the foundations of a complex industrial core or a thriving services sector that relies on human capital. 41 Other resource-poor nations (such as the ICS, Barbados, and Bahamas, etc.) start from labor-intensive final consumption goods derived from basic agricultural products or simple manufacturing. As these prod-

<table>
<thead>
<tr>
<th>“Broad Cluster”</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>40% Upstream Industries</td>
<td>Primarily used as inputs into other industries</td>
<td>Gold, Timber, Oil, Memory chips</td>
</tr>
<tr>
<td>10% Industrial and Supporting Functions</td>
<td>Centers of complex operations, which are conduits of innovation and upgrading</td>
<td>Power generators, Motor vehicles, VFX, TV tubes</td>
</tr>
<tr>
<td>50% Final Consumption</td>
<td>Goods destined for final consumption</td>
<td>Breakfast cereals, Television sets, Jewelry, Diamonds</td>
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2.2.2 Economic Performance and Trade Statistics

The analysis of trade statistics allows us to delineate the broad economic and export patterns that emerge across the region for their existing manufacturing clusters. The analysis also provides insight into the evolution of these economies towards higher levels of productivity and value-added products. Appendix 4 shows the detailed trade statistics for 14 out of the 15 countries of this study (except Antigua, which did not report their trade statistics).

In essence, there are two broad exporting patterns emerging in the Caribbean:
- Countries with high export concentrations in traditional crops with very limited processing and added value to their products. Most of these exports include food and beverage products for final consumption. Example: St. Lucia.
- Countries with high export concentration in the resource extraction upstream industries. These are usually petroleum or mineral abundant countries, exploiting those resources almost directly from the ground with very limited processing or added value.

Barbados represents a third emerging pattern of a truly diversified economy. So far, it is the only country that has shown visible progress in adding complexity, and shows the potential for other neighboring countries. The following sub-sections will analyze these broad patterns and their implications for devising an economic strategy for the region in years to come. Country snapshots are also provided to highlight specific patterns on a country by country basis.

Concentration on Final Consumption Goods

Several Eastern Caribbean countries illustrate the first pattern mentioned above. They include:

Dominica’s growth rate has actually stagnated since 1999, averaging at –1.65 percent over the past five years. Government services account for 48.7 percent of GDP in 2012. Other important sectors were agriculture, wholesale and retail trade and banks/insurance. Dominica is a highly focused economy, where more than 90 percent of exports are concentrated in the food and beverages industry and housing/household final consumption goods. Over the 1994–2002 period, the total export share in this sector has remained relatively constant (Refer to Appendix 4, Table 4.1). However, if we look at the first five exports, we see that in recent years the ucts are commoditized and price competition becomes fierce, countries should start focusing on a number of niche markets and in parallel, invest in human and knowledge capital to develop a competitive service sector. As the following section shows, these countries’ current situation helps create the tension and urgency for a clear growth and competitiveness strategy in the region.

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country has decreased its reliance on just a few export goods, which together represented 67.8 percent of the country’s total export value versus 85 percent for 1994 (Refer to Appendix 5, Figure 5.1). In 2002, this export basket was comprised of (i) soaps, (ii) bananas and plantains, (iii) perfumery and cosmetics, (iv) disinfectants for retail and (v) washing preparations (such as cleaning agents and waxes).

St. Lucia has had some episodes of positive growth over the past five years, but on average, growth rates have been negative. Services (hospitality, banks/insurance, transportation and wholesale/retail trade account for the largest part of GDP, aside from government service. St. Lucia is also an example of a highly focused economy, where 83 percent of 2000 exports came from food and beverages and another 8 percent from textile/apparel goods. This amounts to more than 90 percent of exports being concentrated in final consumption goods (Refer to Figure 2.1). The country’s top five exports (in terms of export value for 2000) were (i) bananas/plantain, (ii) non-alcoholic flavored waters, (iii) outerwear and other clothing accessories, (iv) fixed and variable resistors and (v) beer (Refer to Appendix 5, Figure 5.4). These goods represented over 85 percent of the country’s total export bill and exemplify the country’s highly dependent and concentrated economy, more so, looking at export shares over 1992–2000, this pattern seems to have worsened in recent years. St. Vincent and the Grenadines has grown at an average rate of 2.38 percent since 1997. Its economy is still highly dependent on agriculture (close to 9 percent of GDP in 2002) and wholesale/retail trade. The service sector, especially the hospitality industry, has not been developed and only represents 17 percent of GDP. Government services once again account for more than 17 percent of GDP. In St. Vincent and the Grenadines, 86 percent of the export share is concentrated in food and beverages; another 5 percent of its exports come from the materials/metal goods in upstream industries, and a very small percent from the transportation sector (Refer to Appendix 3, Figure 4.3). In 2002, 72 percent of its exports bill came from the following top five products (i) bananas/plantains, (ii) flour of wheat or milsonin, (iii) milled rice, (iv) roots and fresh tubers (vegetables) and (v) non-alcoholic flavored waters (Refer to Appendix 5, Figure 5.5).

Grenada has grown at an average rate of 3.19 percent over the past five years. Agriculture is still an important sector in the economy, contributing just under 9 percent of GDP in 2002. Transportation, banks/insurance and wholesale/retail trade also each accounted for close to 10 percent of GDP. Government services accounted for 15 percent of GDP in 2002. Grenada’s export pattern points to a slightly more diversified country relative to the ECS, but the country is still reliant on traditional exports. In 2002, 66 percent of the country’s exports came from the food/beverages cluster and 7 percent both from housing/household and personal goods, all in the final consumption horizontal stage. Another important export bill came from mid-band clusters, such as transportation and power generation and distribution, amounting to 14 percent of total exports. Notice that in 1998 and 2000, the export share coming from industrial and supporting functions was considerably higher, representing 32 percent and 58 percent of total exports, respectively. Zooming in on these two sectors, in 1998 and 2000, Grenada was exporting a substantial amount of electrical insulation equipment and switchgear that corresponded to the values we see in the power generation and distribution cluster. In terms of the mid-band “office” cluster, most exports were coming from office equipment such as adaptive machine parts, accounting instruments, etc. It is also worth noting that in 2002, the country’s top five exports only constitute 63.4 percent of total export value coming from the following products (i) nitrile, mace and cardamoms, (ii) flour of wheat (iii) essential oils and resins (iv) fresh fish and (v) toilet paper (Refer to Appendix 5, Figure 5.2).

St. Kitts and Nevis presents an interesting trade pattern over the last few years. In 1994 and 1996, close to 70 percent of total GDP of the country’s top five exports came from food/beverages, whereas in 2000 this sector only represented 27 percent (mostly attributable to sugar cane exports). This decline was complemented by an increase in the power generation and distribution mid-band cluster, which in 2000 accounted for 61 percent of total exports. A closer look at these numbers indicates that switchgear (i.e. switches, relays and breakers) accounted for most of the increase in this export category. Although a snapshot of the country in recent years suggests a more diversified export base, looking at the share of the top exports over the last eight years, indicates a much more focused economy. The years for which country has decreased its reliance on just a few export goods, which together represented 67.8 percent of the country’s total export value versus 85 percent for 1994 (Refer to Appendix 5, Figure 5.1). In 2002, this export basket was comprised of (i) soaps, (ii) bananas and plantains, (iii) perfumery and cosmetics, (iv) disinfectants for retail and (v) washing preparations (such as cleaning agents and waxes).

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data is available (1994, 1996 and 2000) the top five exports accounted for more than 80 percent of St. Kitts’ export value. In 2000, these were: (i) switchgear, (ii) sugar cane, (iii) electrical con-
densers, (iv) non-alcoholic flavored waters, and (v) rotating electric part for power plants (Refer to Appendix 5, Figure 5-4).

The Dominican Republic grew at more than 7 percent per year, for five years since 1996. But, since 2001, its growth has steadily declined and now stands at ~0.4 percent of GDP (2003). Agriculture, manufacturing, wholesale and retail trade, and construction contribute respectively, more than 10 percent of GDP and as a whole account for more than 50 percent of economic activity. The service sector is also representative but not as important as in other Caribbean countries, accounting for less than 50 percent of GDP. The decline in economic activity has particularly affected the construction, wholesale and retail trade, Free Trade Zones, and financial sectors of the economy. These sectors have seen sharp decreases in their eco-
nomic activity during the last 2 to 3 years. Two broad clusters represent the majority of the coun-
try’s export value: food/beverages and metals/ materials. Textiles and apparel used to represent more than 30 percent of country’s export during the early 1990s, but have recently seen a sharp decrease.

Belize’s economy has grown at a commendable rate of more than 4 percent per the past four years, as a result of recent investment in agricultural exports and tourism. The average growth rate since 1998 has been as high as 6.1 percent, and at the beginning of 2000, the country exhibited growth rates as high as 12 percent (2000). The economy is largely focused on agriculture and forestry, wholesale and retail trade, tourism and government services, with each accounting more than 10 percent to GDP. Over the years, agricul-
ture has had a large but relatively declining role in overall economic activity. Agricultural production has centered on sugar cane, banana, oranges/grape-
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Haiti’s current political and social frictions, follow-
ing years of economic contraction pose significant challenges. Major infrastructure programs, being financed by international donors and lenders, are meant to provide new employment opportunities and help lift national income. Haiti’s export flows are primarily centered in the final consumption goods and services broad cluster. From 1992-1996, textiles and apparel were the major export contrib-
utors, with 59 percent of total exports in 1996. The food and beverages cluster is also important, contributing close to 20 percent of the export share over this period. Housing/household products and entertainment/leisure were also of relative impor-
tance but have been consistently decreasing over the years. The only other product outside of these broad clusters is transportation, which accounted for 4 percent of exports in 1996. Most of the prod-
ucts in the textile/apparel sector corresponded to maquila-type of men’s clothing: the following garments: women’s blouses (19.72 percent total exports); women’s undergarments (7.04 percent) and men’s trousers (6.26 percent) and retail trade, tourism and government services, with each accounting more than 10 percent to GDP. Over the years, agricul-
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FIGURE 2.1 Lucia Trade Statistics

Note: Totals may not add up to 100% due to rounding
Source: OTF Group; COMTRADE / UN Trade Statistics (Rev. 2)
Improving Competitiveness and Increasing Economic Diversification in the Caribbean

Since the discovery and industrialization of petroleum and natural gas reserves of oil and natural gas were discovered. Since the mid-1950s, the petroleum industry has been a major contributor to the economic growth and development of several Caribbean countries. The petroleum sector has accounted for a significant share of GDP, with Trinidad and Tobago being the leading exporter of petroleum products.

Concentration on Natural Resource Extraction

The second pattern that emerges is of resource-abundant countries heavily reliant on upstream industries for export revenue. Trinidad and Suriname are the premier examples with more than 80 percent of exports deriving from the material/metals/petroleum/chemical upstream industries. A lesser extent, Guyana and Jamaica have also moved in this direction in recent years by increasing their presence in these export markets. Since most exports are natural-resource related, the level of processing of those goods is minimal. More sophisticated manufacturing in terms of products and processes has not flourished; not even in the oil and gas sector of Trinidad and Tobago, which is righty positioned for diversification into more value-added up and downstream industries and services, such as geological modeling, plastic medical devises and drilling equipment. In turn, the best strategy for these countries is to invest some of the rents extracted in the exploitation of their subsoil assets, and invest in human skills and capabilities and knowledge capital to develop a more sophisticated manufacturing and service sector.

Trinidad and Tobago has had a sound overall economic performance over the past decade, with real GDP growth averaging slightly over 3 percent. After the downturn in economic activity at the beginning of the 1990s, growth picked up since 1994, peaking at 7.1 percent in 1998 as new reserves of oil and natural gas were discovered. Since the discovery and industrialization of petroleum five decades ago, the importance of agriculture has declined in favor of the energy cluster (the extractive industry and its related upstream and downstream dependents) while the service sector has become a driver of growth in the rest of the economy. The petroleum sector now accounts for more than 30 percent of GDP, while non-energy manufacturers contribute less than 7 percent of total economic activity. Also of relative importance are distribution and financial/insurance services, representing 14.3 percent and 16.1 percent of GDP (Refer to Appendix 3). Not surprisingly, in Trinidad and Tobago most of the exports are concentrated in petroleum and chemical upstream sectors and in the food and beverages final consumption goods. This pattern persists from 1992 to 2000. In 1992, production of petroleum inputs accounted for 76 percent of total exports and by 2000 this share had increased to 81 percent. An emerging cluster in upstream industries, is the material/metals sector, which represents, on average, 8 percent of the country’s export share. With respect to the food/beverages cluster, in 1992 this sector represented 10 percent of the total export share, increasing over the next six years to 15 percent of exports. However, by 2000 this cluster substantially decreased to 8 percent of exports.

Suriname has also one of the most concentrated export baskets. The overall tendency from 1992 to 2000 was an increased concentration in material/metals/petroleum/chemical upstream clusters, at 80 percent of exports, with the remainder share originating in food/beverages final consumption goods. The top five exports in terms of total export value, represent an astonishing 92.5 percent of total exports, a pattern that persisted over the period of analysis. All together, alumina exports accounted for more than 66 percent of the country’s export value. Gold, which represents the second source of export revenues for Suriname, stands at a distant 12 percent of export value.

Guyana’s growth rate over the last five years has been very modest, averaging 1 percent of GDP. The period has been characterized by slight growths followed by negative growth performances. The service sector is the largest contributor to GDP, with over 40 percent of economic activity deriving from it. Agriculture, forestry, and fishing are also of considerable importance, accounting for almost 30 percent of GDP. Finally mining, petroleum/chemical upstream industries (42 percent of total exports) and food/beverages consumption goods (33 percent of total exports). There are some emerging clusters in transportation, which represented 8 percent of total exports in 2001, and in the personal and housing/household final consumption goods, representing 4 percent and 2 percent of total exports respectively. The top five export products in the Bahamas derive from the petrochemical and food beverages clusters: polyethylene manufactured plastics (accounting for 19.10 percent of total exports), fish (19.09 percent of total exports), gas oils (18.32 percent), alcohol beverages (10.25 percent) and salts (3.60 percent). Overall these exports accounted for 70.3 percent of total exports in 2001.

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manufacturing and construction each represent the remaining 30 percent of GDP. The importance of the service and agricultural sectors has remained relatively unchanged over the past decade. The service sector is comprised solely of the government’s activities, which consistently represent between 12-15 percent of GDP. Export data for Guyana was only available for 2000 and 2001. As the trade chart in Appendix 4 illustrates, the country’s exports come from two broad clusters: material/ metals and food/beverages. In 2001, gold and sugar accounted for 24 percent and 20 percent of total exports, respectively.

Jamaica has been characterized by negative or very low rates of economic growth during the past few years. Over the past five years, growth has averaged less than 1 percent of GDP. Services currently represent more than 70 percent of the country’s economy, with communications, finance, insurance, tourism, and government services accounting for most of it. Manufacturing, agriculture, and mining are also important economic activities, although their relative contribution to GDP has decreased in recent years. In terms of trade patterns, Jamaica is fairly focused in three broad export clusters: food and beverages, and textiles and metals (Refer to Appendix 4). However, increasingly the material/metal cluster has taken over other export sectors of the economy. For instance, in 1998 this sector accounted for 54 percent of total exports and in 2002 it was 67 percent. Textile exports, mostly garments, have grown in maquila type production, have had a precipitous decrease from 21 percent of exports in 1998, to 2 percent in 2002. Looking closely at Jamaica’s top export products, alumina and aluminum ore account for an astonishing 65 percent of the total exports.

Barbados—An Optimistic Anomaly

Barbados stands out as an outlier in terms of the patterns coming out of its trade statistics. The country has a small foothold on the industrial and supporting functions middle cluster band, and does not have excessive concentration either in natural resources or the food and beverages final consumption sectors. Sectors such as power generation and distribution, office and transportation have been relatively important exports from 1992-2002.

Barbados grew at more than 5.5 percent per year at the end of the 1990s; however, in more recent years growth has stalled. In 2001 and 2002, the country had negative growth rates of 2.8 percent and 2.1 percent, respectively and only improved slightly in 2003 with a positive rate of 1.3 percent. The service sector is the largest contributor to GDP, with finance and banking, wholesale and retail trade and government services accounting for more than 55 percent of GDP (Appendix 3). Also worth noting is the contribution of tourism to GDP, which represents more than 10 percent of the economy but has steadily declined in importance since 1997. Barbados shows a healthy degree of export diversification, both across broad cluster levels and in terms of export goods. Since 1992, exports have remained relatively constant and reflected the following pattern: first, slightly over 60 percent of exports are concentrated in final consumption goods and services (with close to 40 percent coming from food and beverages). Second, more than 20 percent of exports correspond to the industrial and supporting functions cluster, primarily transportation, and power generation and distribution, but also increasingly from multiple business sectors. Finally, less than 20 percent are coming from upstream industries. In the latter category, it is important to highlight how the decline in exports of semiconductors/computer products has been compensated by an increase in petroleum/chemicals. This pattern may pose some concerns as to the development of an industry that can decapitalize the island (corresponds mostly to Kerosene Jet fuel and other fuel oils). In comparison to other Caribbean countries, Barbados exhibits less reliance on just a few export products. For instance, in 2002 the top five exports only represented 38 percent of total exports in comparison with other Caribbean countries that have as high as 90 percent of export concentration in their top five products.

As shown by the trade statistics, most Caribbean countries concentrate their exports on low-end consumer goods and saw materials. As previously mentioned, niche manufacturing and the service sector are probably the most important sources of future growth for these economies if the correct strategies are in place to nurture a knowledge and human capital as their most valuable asset. Although some countries are expanding these sectors more successfully than others, the Caribbean can learn from countries such as Ireland, about how ICT can be leveraged to pave the way for a knowledge economy.
FIGURE 2.2 Trinidad & Tobago Trade Statistics

Source: OTF Group, COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 2.3 Barbados Trade Statistics

Source: OTF Group; COMTRADE / UN Trade Statistics (Rev. 2)
Ireland: The Development of a Knowledge Economy

Ireland's dramatic transformation from a largely agricultural and manufacturing based economy to a service, pharmaceutical, and information technology economy has resulted in sustained increases in per capita income. At the time of the 1922 partition, Ireland enjoyed free

Countries such as Jamaica have tried to strengthen their ties with Ireland in search of ways to replicate their success story. For instance, Digicel (an Irish-owned mobile telephone operator that has gained leading market share in several Caribbean markets, including Jamaica) hosted a workshop in Jamaica in mid-2003 during which several key actors in Ireland's social partnership shared their experiences of over a decade. The government, labor unions, and civil society were all present. They generously provided details of how they came together to make the difficult sacrifices and subsequently amazing progress that is now commonly referred to as the "Irish Miracle." These experiences were shared through workshops, press conferences, and meetings with officials from the private sector, government, and labor unions.

This interchange led to the creation of a Partnership for Progress (P for P) between Jamaica's

2.3 Enabling Environment for Access and Ability: Where Do We Stand?

Access

On the dimension of access, several public and private initiatives have met with recent success. Telecommunications liberalization across the Caribbean has led to increased telephone coverage in the region. The widespread use of mobiles and their relative affordability has compensated a little for the slow growth in fixed-line telephony. For instance, from 1997 to 2002, fixed telephone line penetration considerably stagnated in the Caribbean, growing at a compounded annual rate of less than 5 percent. On the contrary, the annual growth rate of cellular subscribers surpassed the 50 percent mark in all the Caribbean, which exceeds the United States and other high-income, small island economies (such as Ireland and Singapore). Some countries like Antigua and Barbuda, Bahamas, Barbados, Dominican Republic and Jamaica now have more than 80 percent of the population owning a cellular phone. Likewise, affordability of mobile telephony makes for a more attractive choice than fixed lines. In most Caribbean countries, prepaid mobile services are a cheaper and more flexible option, without the commitments that a fixed line requires (i.e. fixed monthly payment whether the consumer uses the line or not, credit qualifications, connection charges, etc).

In addition, much of this demand has come from people for whom a mobile is their first telephone. As cited by a recent study from the World Bank, the economic impact of increased mobile coverage has been substantial, for instance by allowing casual workers and trades people to increase their productivity through greatly improved communication with their employers. This is the case in places like Jamaica or the Dominican Republic, where tele-density of mobiles surpasses that of fixed line telephones (See Figure below). For instance, Jamaica has the highest penetration in the region with over 80 percent of the population owning a cellular phone.48 Likewise, affordability of mobile telephony makes for a more attractive choice than fixed lines. In most Caribbean countries, prepaid mobile services are a cheaper and more flexible option, without the commitments that a fixed line requires (i.e. fixed monthly payment whether the consumer uses the line or not, credit qualifications, connection charges, etc).

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50 subscribers per 100 inhabitants (this figure is well above the average for upper middle income countries like the United States, but still slightly lower than in Singapore, New Zealand, or Ireland). However, Jamaica's case is more of an exception than the norm. While progress has been made in allowing the average citizen to connect through phones, teledensity both in terms of fixed lines and mobiles remains low in places such as Belize, Dominica, Dominican Republic, Guyana, Haiti, Suriname and Trinidad and Tobago.

In addition, business people, public officials and residential customers alike still rightfully complain about high telecommunications prices and overall network reliability (refer to figures below). Although there is partial privatization in almost all Caribbean countries both in the long distance market and for Internet service providers, outbound calls are still higher than inbound calls**, and Internet services are more costly than in countries with comparable income levels. For instance, the cost of 20 hours of dial-up access in St Lucia is US$22.22 compared to US$8.42 in Malaysia**, while the most affordable broadband ADSL subscription in the country starts at US$87 per month or 14.6 percent of per capita income.** Likewise, the cost of high speed Internet is as high as US$400 per month in Antigua, Barbados, and Jamaica, while it cost US$40–50 in the United States.

In terms of Internet hosts and computers, usage is disparate across the Caribbean but still considerably below the average for similar income countries. Internet density is particularly low in the Dominican Republic, Haiti, Suriname and St Vincent and the Grenadines, at 3.64, 0.96, 4.16 and 5.98 users per 100 inhabitants. Other countries, such as Jamaica and St Kitts and Nevis have relatively higher usage rates of more than 20 users per 100 inhabitants. These are all substantially lower than in the United States, Singapore and New Zealand.

If we foresee a Caribbean knowledge and service economy that is at the forefront of ICT usage across all sectors of the economy, telecommunications and Internet costs should be priced competitively at

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**Ref.:**

49 International Inbound and Outbound phone rate graph refers to the following: household, off-peak rates from Cable & Wireless, SingTel and Verizon (Dominican Republic). Dial-Up and High Speed Internet graph data refers to the following: Dial-up 56Kbps and 20 hrs access; High Speed: ADSL 1.544Kbps, except for Trinidad T&T and unlimited access; household rates, except for Jamaica; installation fee is not included.

50 Ibid.

51 Ibid.
U.S. levels and broadband access should be available on a wider scale. Private sector organizations, such as hotels, manufacturing companies and those that attract FDI, should exert further pressure in this arena.

Although some countries in the region have been progressive in addressing telecommunications liberalization, most have been slow in executing reforms. For instance in the ECTEL member states, although licenses have been given to further competition in fixed, mobile, and Internet services, the pace in which new operators have entered the market is quite disparate. While mobile operators have entered the region in an active manner, the pace of new entrants in fixed-line and ISP has been poor. Nonetheless, although ECTEL recommended the issuance of a cable landing license in each of the five countries, to date Cable and Wireless is the only operator of submarine cable that links the region to the outside world. Others, like Trinidad and Tobago, have included liberalization of this sector in their policy agenda for more than a decade, but have yet to pursue concrete steps to materialize the effort. In the Dominican Republic, Verizon is the dominant fixed line player, although in the last years a new local provider TRICOM entered the market and invested heavily in duplicating Verizon’s fiber optic network. While they put up a good fight and have a growing customer base, they are currently facing financial problems due to the heavy investment. This example depicts a common paradox in this problem: while it is easy to blame the government for dragging its feet in deregulation, there is also little economic incentive to invest in underground cable as a second comer in the business in small islands like those in the Caribbean. While current high prices might make it appealing, it is not hard for a regional monopoly like Cable & Wireless to drop local prices and drive competitors out of business.

Another problem that hurts price competitiveness is the willingness and propensity of governments to tax this sector heavily. In the Dominican Republic, taxes on telephone bills add up to 26 percent. When the recently elected government of President Fernandez found itself in a serious fiscal deficit, it raised taxes on telecommunications and exports.

Although these two sectors are key to growth and competitiveness, they also have the disadvantage of being easy and immediate sources of tax revenues.

Ability

Ability refers to the willingness—and preparedness—of individuals in an organization to use ICT. This is directly related to their level of education and technology training. The general situation in the Caribbean is that while primary education is universal with enrollment rates of over 90 percent, secondary school enrollments are much lower and tertiary education is at best a luxury only for those in the upper end of the socio-economic scale. This is particularly true for the EGS and in Haiti, Belize and Trinidad and Tobago, where less than 6 percent of the population attends university (See Table and Figure on page 43).

In recent years, governments across the Caribbean have pledged to achieve provision of universal primary education and in large part have been able to do so. Apart from Haiti and to a lesser extent Grenada, all countries had primary enrollment rates upwards of 90 percent in 2002 (refer figure below). Secondary enrollment rates have also improved; in some places such as Barbados, the Bahamas, Dominica, and St Kitts and Nevis, current rates are on par with the ones observed in high-income countries like Ireland and Singapore. Other countries

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In recent years, governments across the Caribbean have pledged to achieve provision of universal primary education and in large part have been able to do so. Apart from Haiti and to a lesser extent Grenada, all countries had primary enrollment rates upwards of 90 percent in 2002 (refer figure below). Secondary enrollment rates have also improved; in some places such as Barbados, the Bahamas, Dominica, and St Kitts and Nevis, current rates are on par with the ones observed in high-income countries like Ireland and Singapore. Other countries
such as Haiti, Grenada, and the Dominican Republic, still have some way to go in secondary school attainment, having enrollment rates of less than 50 percent. However, tertiary level enrollment is still the greatest educational weakness in the region. Across the ECS, it averages a meager 2 percent. A small group of graduates go abroad to study, which rates tertiary ECS enrollment rates to approximately 12 percent, yet the majority of the local workforce has barely finished primary school. Barbados and to some extent Bahamas and the Dominican Republic, have made some progress in this respect having more than 20 percent of its youth attending university. Nonetheless, the picture looks bleaker when compared to other island nations that have tapped into ICT for growth like Singapore, Ireland, or New Zealand, where tertiary enrollment rates stand at more than 40 percent.

The following table also shows the low level of educational attainment of the current workforce in the Caribbean. Although the share of workers with secondary school education is in some cases even greater than in higher income countries, there is a troublesome tertiary level gap across the region. The ECS are in a particularly precarious situation. For instance, in St Lucia, St Vincent, and Grenada, over 65 percent of the adult population has only a primary level education (refer to Table below). The levels of training and certification also demonstrate this low level of human capital, which has contributed to the continuing dominance of the mostly low-skilled sectors in the economy where ICT usage and upgrading is less common (this is further explored in the Trade Statistics section). Although these indicators do not attest to the quality of education, which is what ultimately matters, at such low levels the Caribbean should be worried about expanding those levels while at the same time making tertiary education relevant to the workplace.

This tertiary education gap stems from supply-side constraints as much as from the historical structural transformation of these economies. From the 1960s to the 1980s, most Caribbean countries were largely agricultural-based economies. The demand for greater than in higher income countries, there is a troublesome tertiary level gap across the region. The ECS are in a particularly precarious situation. For instance, in St Lucia, St Vincent, and Grenada, over 65 percent of the adult population has only a primary level education (refer to Table below). The levels of training and certification also demonstrate this low level of human capital, which has contributed to the continuing dominance of the mostly low-skilled sectors in the economy where ICT usage and upgrading is less common (this is further explored in the Trade Statistics section). Although these indicators do not attest to the quality of education, which is what ultimately matters, at such low levels the Caribbean should be worried about expanding those levels while at the same time making tertiary education relevant to the workplace.

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58 The data shown in Appendix 2, Table 2.1 pertains to the results of the Caribbean Secondary Examination Certificate (CSEC) in English and Math for 2000. In 1998 alone, there were almost 17,000 people from the Caribbean studying in the OECD. This is strong evidence that Caribbean university education was and at present is not ready to take the lead in transforming these countries out of their traditional sectors and into a knowledge-based economy.

Still, the quality of education, not school coverage, is key to using ICT in creative and efficient ways. The essential precondition for success is the presence of the skills and capabilities that promote the use of technology in specific clusters. In this area, the Caribbean is lagging, especially in areas such as English, math, and science which are close predictors of the ability of countries to innovate and develop a thriving knowledge economy. Also, the general perception among business and academic circles across the region is the lack of skilled labor as it pertains to complex deployment and utilization of ICT. As stated by the Director of a private Training and Certification Institute in St. Lucia, secondary school students are not graduating with the right ICT skills and what is more worrisome, this skills gap seems to be widening in relation to other countries that are university education was minimal in terms of the skills required to succeed in the labor market. Although the structure of economic activity has changed only fairly recently, efforts to diversify the economy are starting to exert demands on skill upgrade and technological transformation as the service sector gains momentum and other industries develop. Given these countries’ historical context, few tertiary education institutions have been operating and able to absorb this higher demand. This was evidenced by the rising number of Caribbean students seeking university education abroad. During the 1980s for instance, approximately 22,000 U.S. and 13,000 Canadian student visas were issued to the English-speaking Caribbean, and in 1998 alone there were almost 17,000 people from the Caribbean studying in the OECD. This is strong evidence that Caribbean university education was and at present is not ready to take the lead in transforming these countries out of their traditional sectors and into a knowledge-based economy.

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Source: OECS Human Development Report 2002

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56 Inter-American Development Bank (2003).  
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61 Ibid.  
62 Ibid.
direct competitors in ICT sectors (India, Ireland, China, the Philippines, etc). Private sector leaders also reinforce this view, as stated by the CEO of Gale Force Windows in Antigua, “we don’t have a problem recruiting for our factory and providing training, what we need are managers that can open new markets, and interact with our customers to create new opportunities for the business.”

As further analyzed in section 5, the lack of skilled labor represents a major obstacle for firms wanting to set up more complex ICT operations in the regions (for instance in more sophisticated ICT operations, such as software development and other type of business outsourcing). The offshore industries are important consumers of IT talent, but as the chief operating officer of a gaming company noted, “We are obliged by law to hire locals at a ratio of 3:1, while that is not a challenge given our competitive pay, the real experts in IT and gaming are coming from the United Kingdom and Australia.” With the size of the industry in the Caribbean, these are skills that the Caribbean could be exporting elsewhere.

Although some commendable efforts have been made to incorporate IT in the education system (especially at the primary level), wider ICT literacy will only become a reality when both individuals and organisations use them in their day-to-day lives and when the appropriate advanced training becomes available to those about to enter (and already in) the workforce. While reliable data on the availability and usage of computers and the Internet in Caribbean schools is not available, the general perception is that efforts have been made to incorporate IT in the education system, such as the Cicerone School in St Lucia, but that there is still a long way to go in this direction.

There are, however, countries in the region (such as Barbados and the Dominican Republic) that have embarked on more visionary attempts to incorporate IT in the education system. For instance, the merit of EDUTECH in Barbados relied on intrinsically transforming the society, whereas all children were raised with ICT. Although the project has had operational difficulties in the process of upgrading the entire school infrastructure, there is a critical mass of educational institutions that have fully embraced this transformation. Some of the students of this program are 12-year-olds that can now fix and program computers. These children are likely to be prepared for high technology, and high technology-enabled careers.

The challenge then is to ensure that secondary and post-secondary education becomes relevant to the development needs of the Caribbean, and to the specific cluster opportunities within. The first steps have been taken by new IT schools opening up throughout the region, such as the Technology for the Americas in Santo Domingo and a new institute through a partnership of the Dominican Republic’s PCUMM and New York’s Stevens Institute. The Antigua & Barbuda International Institute of Technology opened in 2002 and the Institute of Self-Improvement Systems in St. Lucia, among others. However, these still have a limited reach, and require a radical transformation in the targeting of these initiatives so that the training is tied to specific local industries. A virtuous cycle needs to be initiated—in which these institutions, partnering with international state of the art facilities, can provide cutting edge research to the local private sector and guide them in the incorporation of ICT in the business world. At the same time the inclusion of the private sector in guiding and participating in these tertiary offerings is important in establishing a profitable demand side for those students’ opportunity costs to be met. For this to happen, ICT centers need to incorporate business principles into the curriculum so that the graduates are not only technically able but entrepreneurial and competent enough to lead institutions in adoption and upgrade.
3. ICT CLUSTERS: WHAT HAS WORKED AND WHAT HAS NOT

The primary focus of this report is on the use of ICT to enable business clusters that are not themselves technology clusters. While this focus has become relatively well accepted within the donor community, to date the majority of ICT investment has been largely geared toward investment in ICT clusters themselves—particularly clusters that were not previously in existence. We will focus at greater length on ICT as enablers, but it is important to begin by debunking the mythology behind so many of the existing initiatives. Therefore, we begin by exploring the many failures, and few successes, in Caribbean high technology initiatives.

3.1 OUTSOURCED BUSINESS PROCESSES SERVICES: CALL CENTERS, OFFSHORE BUSINESS PROCESSES

The story of outsourcing business processes (OBP) in the Caribbean is by no means a recent one. Although current market conditions and improved ICT systems may have increased the trend, business outsourcing has been an attractive industry in the region since the early 1980s, when U.S. companies started looking closer to home to outsource projects in lower-cost markets. Nearshore operations were attractive because communication and information transfers were still an impediment for more distant locations. Hence, the Caribbean became the hub for a near-shore data processing industry coming out of the United States.

For instance, in 1983 American Airlines assessed different locations to place a wholly owned subsidiary devoted to data processing services (payroll reports and checks, frequent-flyer database management, customer queries and upgrades, etc.). It decided to invest in Barbados for the readiness of the workforce for training, the work ethic, the stable environment, and the proximity to headquarters. At the peak of the business, the company, known as Caribbean Data Services, employed 1,500 local workers for an average salary of US$1,000 per month (1998). The company became so successful that it started servicing other big U.S. companies such as AT&T and BlueCross/Blue Shield and opening subsidiaries across the region (Dominican Republic and Jamaica). By end of the 1990s the company employed more than 3,500 people in the Caribbean.

However, Caribbean Data Services was not able to survive the technological transformation of the industry or to take its services to the next level of complexity. As data processing began to rely more on the use of the Internet and online transactions, telecommunications costs became prohibitive to doing this type of business in the region. At the same time, companies were also facing increased pressure to reduce costs, and as countries such as India, China, and the Philippines made a full-fledged entrance into the game, the Caribbean could no longer compete on the basis of wages.

This first wave of ICT OBP was a real missed opportunity in the Caribbean. Barbados failed to make a proactive strategic shift to more value-added services and did not grasp how intrinsically technology changed the way they were doing business. Countries in the Caribbean did not take ownership of this technological transformation to take it to the next level, so that they could have waved off competitors from lower-cost sites. High telecom cost was one of the main barriers to the technology innovations needed in this industry, as online transactions. Yet Barbados could have developed a very specific industry expertise, such as in airlines, healthcare, tourism, and customer service and created spin-offs of PRT. The lack of proactiveness in the business sector to push for a more forceful liberalization of the telecoms sector, and a poor telecom technology platform did not allow for the necessary spillovers.

The second ICT wave involved call center operations for U.S. and European companies looking for low-cost customer service and telemarketing. The primary focus of this report is on the use of ICT to enable business clusters that are not themselves technology clusters. While this focus has become relatively well accepted within the donor community, to date the majority of ICT investment has been largely geared toward investment in ICT clusters themselves—particularly clusters that were not previously in existence. We will focus at greater length on ICT as enablers, but it is important to begin by debunking the mythology behind so many of the existing initiatives. Therefore, we begin by exploring the many failures, and few successes, in Caribbean high technology initiatives.

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In 2001, the worldwide customer care industry was estimated to represent a US$34.9 billion market. Experts project the market will exceed US$90 billion by 2006.

This time around, Caribbean governments and companies showed a renewed and more pronounced interest in this industry as an option to create jobs, diversify the economy, and train themselves from a shrinking agricultural sector and an uncertain hospitality sector. In most cases, regional governments have been more than willing to fund training and provide fiscal incentives to local and foreign operators.

For instance, in the ECS, where unemployment rates stand at 15–20 percent, call centers have been embraced as unemployment buffers. It has not been rare to hear the number of jobs created by a given new call center as the centerpiece of its publicity efforts.

Unfortunately, wide-scale unemployment absorption has not been achieved. Employment promises have been overstated and the results have been largely disappointing.

There are various reasons why most call center operations in the Caribbean have not reached their potential, and it mostly relates to a lack of understanding of the Caribbean’s relative competitive positioning in this business. There are two major types of call centers: telemarketing, which involves outbound calling to sell products and services, and customer service, mostly inbound calls answering concerns and solving customer problems. The telemarketing centers receive commissions on sales closed. Typically a call center will purchase call lists, and are paid, for instance, by a credit card company based on how many credit cards are sold.

Particularly in telemarketing, and in low-level customer service, the ability to compete is based on low costs. Some of the reasons the Caribbean could not compete in this business include:

- **Employee Profile.** The type of candidates attracted to the call center business saw it as temporary employment, where they can have some “hands-on-experience” in using a computer and other IT tools and systems.
- **Low Labor Productivity.** Call centers from the United States will only outsource operations to the Caribbean if they are able to make at least 40 percent savings margins. The Caribbean services, in 2001, the worldwide customer care industry was estimated to represent a US$34.9 billion market. Experts project the market will exceed US$90 billion by 2006.

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**Call Centers Antigua Ltd. (CCAL) Case Study**

**Call Centers Antigua Ltd. (CCAL) was a joint venture between the Government of Antigua and Barbuda and Caribbean Information Technologies (CIT).** It was established as a way to provide employment for Antigua nationals, coupled with some exposure to IT skills. The government put in EC$31 million for a 40 percent stake. The government paid for the initial investment in computers and training. The center held approximately 400 staff equipped with retouched computer. At full capacity, the center was projected to hold 850 agents.

CCAL started operation on February 21, 2002. The hope was that this labor could be sourced from the large pool of unemployed workers. Compared to wages in the rest of the economy, the call center of US$110-150 per week was not as attractive an option (manufacturing jobs paid close to US$200, and high tech jobs in gaming were US$500-700). Furthermore, these wages were contingent on sales closed, as is the case with most telemarketing centers. The closing rates were much lower than those in other regions of the world, such as India and the Philippines. At these wage levels, employees regarded this work as transient and not competitive position in this business. There are two major types of call centers: telemarketing, which involves outbound calling to sell products and services, and customer service, mostly inbound calls answering concerns and solving customer problems. The telemarketing centers receive commissions on sales closed. Typically a call center will purchase call lists, and are paid, for instance, by a credit card company based on how many credit cards are sold.

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- **Employee Profile.** The type of candidates attracted to the call center business saw it as temporary employment, where they can have some “hands-on-experience” in using a computer and other IT tools and systems.
- **Low Labor Productivity.** Call centers from the United States will only outsource operations to the Caribbean if they are able to make at least 40 percent savings margins. The Caribbean
workforce has not been able to come close to achieving those rates, due to high wages and lower productivity. For instance, the average price per agent hour in Jamaica stood at USD15.50, whereas the same metric was USD10 in India.

Accents. Although it may sound trivial, a major obstacle faced by the telemarketing type of call center has been the lack of trust from U.S. customers in giving out credit card information when telemarketers have foreign accents. There is a lot of hesitation and reluctance to give out credit card numbers over the phone to foreigners.

High Connectivity Costs. Particularly for out-bound calling, the Caribbean still presents very high connectivity costs, and Voice over IP has not been deregulated in most islands.

Most importantly, as call centers became a fad throughout the Caribbean, investments were often not analyzed in a rigorous manner. Despite the use of basic technologies (telephony), many foreign companies demanded generous concessions from government promising spillover effects. Governments supported call centers in Jamaica, Antigua and the Dominican Republic, while in Barbados and St Lucia, the experiments did not receive preferential government support. Some private companies co-invested in some of these initiatives. For example, Neal and Massey, a regional conglomerate, invested in a Barbados call center but in 2001 sold its stake in the company because it did not fulfill its expectations.

There are a few cases where private sector investment and commitment has led to successful call center operations. Vimenca S.A., the largest conglomerate in the Dominican Republic is one such example. It successfully runs a small, 50-person call center for Western Union, for which it owns and operates the local franchise. The call center provides support services for Western Union in the Dominican Republic as well as in the United States. The success of Vimenca’s call center can also be attributed to the extent to which it has been able to mitigate the weaknesses outlined above. Vimenca used employees from its successful local call center as a base to expand services to the United States—thus working on a business it understood well, and with a core of trained employees.

Understanding in advance that candidates often see employment at call centers as temporary jobs, Vimenca decided to promote the jobs to local university students within their office’s vicinity. Not only do the needs of the students match the nature of the employment (most students are seeking part-time income for periods of less than 4 years), but Vimenca was able to accurately predict and plan for in-house training. This university student profile was also quick to learn the technology, and had no expectation to rise up the ladder. In addition, Vimenca is able to pay its callers an average of US$550 a month, which is regionally competitive, (similar call centers in Costa Rica offer up to US$1,000 monthly) which lowers concerns about worker productivity. The abundance of university students in the vicinity provides Vimenca with an ample employment pool of individuals with level 4 English ability (individuals who can speak with fluency without an accent). However, the Western Union manager was clear that she would not venture on a Call Center of over 100 callers, because the employee base did not exist in the Dominican Republic. This venture had been profitable because of the synergies of their main business and a realistic view of its employee base. Finally, through deregulation of the telecommunications industry, the Dominican Republic offers competitive regional connectivity prices. The monthly cost of a T1 Internet connection in the Dominican Republic is roughly USD140, significantly cheaper than an equivalent connection in Jamaica (US$300) and Barbados (US$400) (See Section 2.3).

The Vimenca examples illustrates that call centers can be successful if the conditions are right. Some of these conditions, such as low connectivity cost and appropriate human resources are not in the control of the operators. However, Vimenca’s ability to understand the strengths and weaknesses of the DR helped it to understand the appropriate scope and nature of its enterprise. It also demonstrates how the success of call centers and the extent to which they serve as large sources of employment depend on the availability of the appropriate level workforce.

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Despite recent examples, there are viable opportunities in the call center business, if the Caribbean can create an attractive end of customer service for large/well-known U.S. companies, instead of continuing with the low-cost telemarketing model. The advantage of higher-end customer service accounts has been three-fold. First, customer service accounts guarantee longer-term contracts (2 years plus) because the outsourcing company has to make greater commitment in training and development for the call center employees. Training in this sort of arrangement is more holistic, not only focusing on customer service skills, but also on company specific products, policies and procedures and involve more sophisticated software programs. Second, in those arrangements the call center employees become part of the outsourcing company, improving motivation and reducing turnover rates. Finally, large companies and their clients tend to have more contact with their customer service representatives if the outsourcing company has become the preferred provider of customer service.

Jamaican Call Centers

Several years ago the Jamaican government sold the rights to its local wireless telephony spectrum. Initially selling two licenses, a significant amount of money was raised ($US 150 million), Jamaica had long operated under a C&W monopoly and, as a result, had among the highest wireless telecommunications rates in the world. The new wireless licensees planned the way for the entry of two large companies, one of the most successful, Digicel, who entered the Caribbean market in the same period. In the ensuing competition, Digicel has quickly reached and sustained almost a 2/3 share of the local wireless market, C&W, the incumbent, has fought back not only with wireless rates but also with reduced baseline pricing. The competition has been good for everyone but the possible exception of C&W itself.

As this battle raged, the Ministry responsible for the spectrum sale (Industry, Commerce & Technology – now Commerce, Science & Technology) asked, and was granted, the use of a significant portion of the proceeds of the two sales. The Ministry used this money to establish a fund to encourage the development of international call centers in Jamaica. The fund was to be lent, at high concessionary rates, to investors willing to establish call centers fitting certain parameters.

Much of the fund was lent, with varying results. Several of the companies continue to operate. One company we interviewed reported being delighted with its access in Jamaica. They had surpassed both volume and profit expectations and lived the advantageous financing terms. The majority of those we have met, however, reported frustration with the local labor force, the inadequacy of local business rules, regulations and, most important, norms of behavior. One potential investor reported after a brief visit that her company was simply uninterested that the local environment could support a large enough operators to make the overall investment of the effort worthwhile relative to her core operational markets. We also learned that the Ministry used the proceeds to establish a fund to encourage the development of international call centers in Jamaica. The funds were to be lent, at high concessionary rates, to investors willing to establish call centers fitting certain parameters.

While the results for investors have been mixed, the results for Jamaica have been clear. The call center movement itself has failed to pro-

Another important point is the need for the Jamaican government’s analysis would not have been useful to generate hypotheses. But without testing these hypotheses with firms and labor leaders, it is difficult to consistently develop powerful initiatives.

Perhaps most important, the Jamaican government misunderstood the upward cycle they were trying to create. Call centers alone are akin to maquila labor in textiles. The primary attraction is cheap labor (both on financing and, especially labor). An industry disconnected from a legitimate software or service infrastructure, cannot hope to grow.

In this case, these results might have been predicted with a more insightful analysis. Labor productivity statistics alone, or combined with functional literacy and numerical reports which are readily available, could have told investors from abroad that Jamaica was only well suited for low-end customer service positions. For example: a large number of call centers in the U.S. and UK were able to provide the kind of service that could be done in the Caribbean (with the help of a written manual). The lower margin call center business is unappealing to them. At the same time, once call centers began to locate in Jamaica with the help of much concessionary funding, they discovered that the available labor pool was not nearly as adequate in size and skills to staff a viable industry.

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operations offshore and many often visit call center premises on a regular basis. Therefore, outsourcing in the Caribbean becomes more attractive as operations are near shore and there is more affinity to what happens in the United States.

U.S. companies are realizing that customer service is a chief differentiator. Most companies profess to have great customer service; however many fail to create incentives for the workforce to deliver this service. In the case of low-end call centers, performance metrics are often based on number of calls, yields, and rates instead of customer satisfaction. As major U.S. companies are prioritizing service more highly, they are bringing their operations closer to home to have more control over them. For the Caribbean, there is a choice: it can continue to take on the low-paying telemarketing businesses that it gladly outsourced from the United States or become prepared to absorb the true customer service side of the business, at a higher bar, by investing in a higher skill level.

The latter option will be a challenge, since the service culture in the Caribbean is sub-standard. This is particularly exacerbated in some countries, such as Jamaica, where “service” and “servitude” are often unproductively linked. However, a dedicated effort to change this cultural phenomenon and provide specialized training (on providing pleasant, accommodating and solution-oriented service, listening to customers, etc.) would not only improve the chances to attract these businesses, but have spillover effects on the prominent hospitality industry that is suffering from the same problem of low quality service. These would be important spillovers, rather than the exaggerated influence of call centers on technology industries.

### 3.2 Cyber Parks and Free Trade Zones

FTZs are geographical areas, often located near major ports, which offer companies an array of financial incentives from the local government to invest and operate from these areas. The most common incentives include duty free imports of vital business inputs and tax exemption on corporate profits. The zones also create the indirect benefit of spillover effects caused by the geographical proximity of similar firms. For local governments, FTZs are tools to attract foreign investors that can generate foreign exchange and serve as sources of employment for the country’s economy.

Countries across the developing world from Mexico to the Philippines have experimented with different versions of the FTZ models. These can be grouped into three major categories:

1. **FTZs that focus on manufacturing**, which often entail the assembly of imported inputs, such as textiles, garments and light manufacturing.
2. **FTZs that are IT oriented**, attracting businesses in high-tech industries and providing relatively higher paying jobs to local workers.
3. **Highly integrated Cyber Parks**, or techno parks as they are commonly called, that aim to provide the necessary components for business development and technological innovation. These compounds usually include everything from residential neighborhoods to technical academic institutions as business innovators.

As you move along the spectrum from 1-3, the spillover benefits from increased integration of direct and supporting local businesses and human capital should increase. As the scope of the FTZs increase in terms of incorporating supporting businesses and activities, both management and implementation of these projects becomes more challenging. Regardless of type, the success rate of FTZs will be closely linked to the degree in which a project was driven by significant international demand.

Many Caribbean nations have experimented with FTZs and Cyber Parks as the next policy trend to attract FDI. Barbados has gone for a demand-driven approach, where private entrepreneurs have invested in high-tech conference centers and industrial parks at the request of international interests in Barbados. Trinidad is currently building a cyber park, and St. Lucia’s government conceived the idea but, never executed it because of a lack of interest from foreign investors.

When FTZs first became popular in the developing world, in the mid-1980s or early 1990s, the majority of operations offshore and many often visit call center premises on a regular basis. Therefore, outsourcing in the Caribbean becomes more attractive as operations are near shore and there is more affinity to what happens in the United States.

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Spillover and Positive Externalities in Free Trade Zones

Two types of positive externalities that are expected in theory to arise from the existence of FTZs are increased economic linkages between foreign and local industries and spillovers of knowledge and technological capabilities. However, in both cases, the achievement of these externalities in export manufacturing FTZs has varied. For the most part, the failure to create substantial economic linkages is explained by the absorption capacity hypothesis.65 This hypothesis states that the extent of the linkages built between local firms and foreign firms within the zone depends mainly upon the former’s ability to supply reliable, high-quality raw material and means of production. Weak local business infrastructures and lack of local raw material or low-cost labor are two main limiting factors. Hence, the most successful examples of long-term knowledge transfer are those firms with high absorptive capacity, such as the garment industry in Indonesia, where occurred where there is a minimal technological gap between firms in the FTZ and local firms and where there is a reliable supply of local raw material.

Unfortunately, the low technological gap in production that allows local firms to participate is often the same factor that limits technological and knowledge spillovers. For instance, there has been little to no innovation in the garment industry over many years in any form of knowledge transfer is at best nominal. In cases in which there are real opportunities for knowledge transfer the wide gap in the level of human resources often influences foreign companies to keep their research and technology projects in their home bases.

Technology Spillovers: The Case of China, Singapore and South Korea

However, some countries have been successful in creating backward linkages and technological spillovers mainly through concerted policies and national strategies. For instance, to ensure backward linkages, most developed garment factories in Bangladesh that include indigenous raw material instead of imported ones, are given additional facilities and benefits on prescribed rates. Similar incentives are given to industries with high technological requirements, if raw materials to export-oriented industries are treated as semi-manufactured goods, then they should be imported only if they are processed and are extended to the suppliers of raw materials to export-oriented industries.66 It should be noted that these incentives are only effective in so far as they underline the use of inputs that meet the appropriate standards of the FTZ firms. This supports the view that benefits of FTZs to host countries, particularly in terms of backward linkages, are directly related to location-specific advantages.67

In terms of technological spillovers caused by FTZs, studies have shown that knowledge transfer is inversely related to the degree of insularity of the zones from the local economy.68 Hence, several countries have structured incentives to increase the number of joint ventures in FTZs. For instance, the Chinese government gave preferential access to its domestic market to FTZ companies in its successful Shenzhen location that entered into local joint ventures.69 From 1992 to 1999 roughly 80 percent of high-technology firms in the Shanghai FTZ operated as joint ventures. Though smaller island economies cannot access to domestic markets to the same extent, they can structure other incentives to foster the exchange.

Again it should be noted, that despite incentives, the achievement of technological spillovers depends on the absorption capacity of local human capital. Technological transfer can only occur when local companies export a minimum threshold of human capital.69 Hence, countries where these spillovers have taken place, such as Singapore and South Korea, engaged in early national development strategies that were geared toward upgrading human capital specifically with technical skills. In 1979 South Korea launched the extremely labor-intensive process of stripping of computer core memories in Singapore. The 1980s HP was able to not only assemble but redesign more sophisticated electronic components due to the technological absorption of local engineers.66 If HP should be noted that large amounts of knowledge transfer are required to succeed, then the strategy to migrate to high-tech industries should occur simultaneously with national strategies to upgrade the labor force.

Hence, countries attempting to upgrade their FTZs from those dominated by labor-intensive low-tech firms must understand that knowledge spillovers occur in the FTZ when the FTZ industries match local human capital skill level. Processing and assembly industries can foster spillovers in countries with low skill levels and, if followers are to be maintained, the strategy to migrate to high tech industries should occur simultaneously with national strategies to upgrade the labor force.

64 Stewart, W. (1994). Overall, the literature suggests that the goal of Export Processing Zones in creating backward linkages and technological spillovers has not lived up to its promise. Some countries like Indonesia have succeeded in establishing backward linkages with the same firms. Others, like Mexico, have not. Stewart, W. (1994). "Mexico’s Export Processing Zones: A Case Study of the Impact of Location-specific Advantages--Towards a General Model of Export Processing Zones in the 1990s." Especially through the years built the natural context to the given ratios of productive in Indonesia maquilas has dwindled, as well as the salaries and benefits.


Antigua Free Trade Zones

**Impacts for the FTZ**

Antigua has a history of government-sponsored initiatives to attract foreign investment in order to diversify the island’s economy. From as early as the 1960s, when Antigua was highly dependent on agriculture, the local labor pool provided subsidies to businesses abroad in an effort to attract investment, particularly in manufacturing sectors such as garments, toys, and furniture. However, Antigua’s FTZ initiative has at times faced short-sightedness and a lack of strategic vision, leading to the creation of overly stringent regulations and a lack of funding.

The Antigua Free Trade Zone (FTZ) was established in 1994 as part of a government-led initiative to diversify the island’s economy. The FTZ aimed to attract manufacturing and high-tech enterprises in order to diversify an economy no longer overly dependent on agriculture, but on efforts to attract investment, particularly in manufacturing sectors such as garments, toys, and furniture. However, due to short-sightedness and a lack of strategic vision, the government of Antigua attempted to impose overly stringent regulations and conditions for companies wishing to operate within the FTZ. As a result, many companies were deterred from investing in the FTZ, and by the 1990s, the FTZ had failed to attract the necessary infrastructure to support the development of a high-tech industrial park.

**Lessons Learned**

Antigua’s experience in conceptualizing and implementing Free Trade Zones illustrates both good practices and important lessons learned. Antigua has been good at creating attractive opportunities and attracting foreign investment. However, the government has also recognized the importance of strategic vision and long-term planning in order to attract foreign investment and support the development of a high-tech industrial park.

Antigua has not fulfilled its initial goal of creating a fully connected, enabled high-tech industrial park catering to foreign companies for several reasons. First, Antigua has not had the necessary infrastructure in place to support the needs of the industry. The government had planned to build an IT training facility, which would be used to train the workforce in the needs of the industry by training employees to meet its needs. However, the Antigua government also succeeded in creating a group of skilled jobs and operators accepted the offer, and the industry mushroomed from a handful of players contributing no direct revenue to the government to over 100 legal operators that generated US$25m for the government of Antigua in 2000. The industry also provided an array of skilled jobs which includes IT professionals, engineers, and technicians.

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studies that have attempted to quantify these externalities have produced mixed results, but all point to the importance of establishing links with the local economy as the key determinant of success. Otherwise, very little is left behind when foreign investors exit the economy.

Towards the right of the spectrum of FTZ models, Cyber Parks tackle the more ambitious goal of developing technological industries that foster business development and technological innovation through collaborative competition. Successful Cyber Parks achieve full integration, creating self-sufficient towns of technology that encompass residential neighborhoods, shopping centers, technical universities, research centers, business incubators, and of course technologically modern business facilities. As can be seen from the experience of mature Cyber Parks today throughout the developing world in Taiwan, Indonesia, Malaysia, and the Philippines, similar projects have begun in Latin American and the Caribbean, Costa Rica and the Dominican Republic.

Though all FTZ models use financial incentives to attract investment, Cyber Parks, with their many intertwined components, necessitate not only larger sources of funding, but a longer and more dovetail commitment by government as well as skilled management to properly integrate its many vital components. Cyber Parks rely heavily on the sustained creation of significant intellectual capital through universities, research centers, and business incubators all of which are costly and cannot be developed overnight. In many cases throughout the world, such as Brazil, Indonesia, and Mexico, the challenges of implementing these projects have required centralized management to oversee the integration of its various components.

Due to the complexity of design and implementation, successful techno parks require patience and a deep understanding of the community’s leadership. As can be seen from the experience of prospering Cyber Parks throughout Asia (Indonesia park started as early as 1976), it can take upwards of 15 years for the model to fully mature to a stage where all of its components are pushing towards a common objective – to enable innovation and increase competitiveness through cooperation.74 Hence, many Cyber Parks are developed in stages, over long periods of time. In earlier stages, complimentary institutions may not be an immediate necessity to attract initial investment, but as these supportive components develop, so do the types of businesses within the park and the human capital it employs.

Cyber Park projects also require massive investments in infrastructure. The Taiwanese government invested roughly US$485 million in developing the infrastructure of its 1,000 acre Hsinchu Science Based Industrial Park over a 15-year period, including two major universities and the Industrial Technology Research Institute. Four national research laboratories are located in the Hsinchu area. The Technology Park Malaysia (TPM), inaugurated in 1996, covers 120 acres (90 hectares) and involves a state investment of US$ 80 million and is surrounded by five universities.

Regardless of the type of business that a country wants to attract and the level at which it is supported by complimentary institutions and activities, all FTZ models are the most successful when their creation is immediately driven by the demand of international investors. Unfortunately, many governments have seen Free Trade Zones and Cyber Parks as development projects on their own, with the mentality of “if we build it, they will come.”

The idea of establishing a FTZ is a strategic one. As Caribbean countries seek to transition into a knowledge economy, they need to first establish a clear vision of where they want to gear their economies, and the infrastructure and competencies needed to get there. The more they can build on pre-existing comparative advantages or opportunistic openings, the better. Once this direction is established, countries can aim to close the gaps in terms of skill, knowledge, capital, and technology. Attracting FDI is a strategic decision that should make sense for studies that have attempted to quantify these externalities have produced mixed results, but all point to the importance of establishing links with the local economy as the key determinant of success. Otherwise, very little is left behind when foreign investors exit the economy.

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**Dominican Republic CyberPark**

In 2000, the Cyber Park of Santo Domingo (CPSD) was founded as a joint venture between the government of the Dominican Republic and the private sector in the hopes of attracting foreign investment that would serve as the foundation for a thriving high-tech sector. The US$50 million, 200,000 square meter Cyber Park, equipped with the latest in telecommunications infrastructure, would not only generate revenue for the government, but it would also act as a source of employment for thousands of high-skill, well-paid Dominican workers. Investors would benefit from financial incentives such as a 100 percent exemption on corporate taxes, non-interrupted government-subsidized electricity, duty-free imports, and a free trade zone.

However, despite a multi-faceted approach to attract investors, offering everything from financial incentives to an institute to supply an appropriately skilled labor force, the Cyber Park of Santo Domingo has failed to live up to its expectations. At its peak in 2002, the three companies located within the park employed 32 workers, more than 84 percent of whom held non-technical jobs such as manual labor and administration. The technical jobs, which the Cyber Park was intended to create, offered an average monthly wage of US$236, over 3.5 times the average monthly wage of manual laborers across the country’s Free Trade Zones. Presently, the Cyber Park has no more less operating on its compound.

**External Factors**

The case of the CPSD demonstrates that follow through of policy implementation is essential. Earlier this year, the Inter-American Development Bank reported that unpredictable government policy is one of the main reasons investors have a negative impression of the Dominican Republic. As a branch of the initiative of President Leonel Fernandez, the Ministry of Industry put life energy into creating the park’s development, managing the compound and seeking the needed investors.

However, the CPSD has also had the formidable challenges of growing during a difficult period for both the global and national economies. The CPSD came to a screeching halt, slowing to a negative 0.4 percent in 2003. The Dominican Republic was thrown into a financial crisis in that year by a banking scandal in which the operators of Baninter, a major commercial bank, were jailed for fraudulent practices. At the end of 2000 FDI to the FZ equaled US$1.2 billion, but due to economic instability, falls to investor confidence, and the economic recession, total FDI dropped to US$306m in 2003.

In parallel, there has been a 12.5 percent decrease in the employment base of FTZ in the DR from 195,262 in 2000 to 170,833 in 2003.

**A Renewed Focus**

Since Fernandez’s reelection earlier this year, President has made the continued development of the Cyber Park a top priority. Fernandez has embraced the creation of a new, high-skill, well-paid Dominican workforce, and has made the successful implementation of the CPSD a focal point of his administration. Fernandez has informed the creation of a new, technical university to be located within the Cyber Park, which he believes will aid the acceleration of the island's technological innovation and business development. The institute, the result of collaboration across the globe, would serve as the pre-existing ITLA and complement, not simply duplicate, its services.

76 VAB Business Environment Report: The Dominican Republic April 2003
79 IADB Business Environment Report: The Dominican Republic April 2003
82 Forfarba, M., and Garlington (1997)
long term sustainability, realizing spillovers into the rest of the economy and upgrading jobs.

3.3 COMPUTER SOFTWARE INDUSTRY

The computer software industry is a fairly new and fragmented sector in the Caribbean. Some of the first firms sprang up during the mid-1990s as a natural extension of back-office business data processing. The majority were foreign-owned companies, outsourcing part of their software engineering process to the Caribbean because of the incentives provided by local governments. Most operated under the offshore jurisdiction, receiving favorable tax treatments and other incentives for setting up shop on an island. The two countries that have most heavily publicized their computer software industry are Barbados (in areas such as coding and abstraction) and Jamaica.84

However, Caribbean governments have failed to follow a proactive strategy to attract these computer software businesses. Furthermore, they were unsuccessful in articulating the FDI synergies and the development of local computer software industries. As pointed out by the Director of the Chamber of Commerce for the International Business sector in Barbados, this was very much a “scatter shot” approach used to lure investors. In most instances, foreign investors came to governments trying to sell the idea in exchange for financial incentives.

PRT Ltd was one of the first software development companies in the Caribbean. This U.S. company set up operations in Barbados in 1996 and employed close to 300 Indian programmers to develop software for companies such as JP Morgan and Prudential Insurance. PRT was classified as an offshore company enjoying tax benefits and rent-free facilities. In turn, the company employed and trained locals and pressured the government to procure high performance communications. By 2000, however, the company left the island and closed operations. Adverse economic conditions in the United States (Internet bubble burst) forced the company to lower costs. Furthermore, the fact that it could not replace Indians with Barbadians made it hard for them to compete. However, its four year presence on the island created a spill-over in terms of IT skills and career advancement in the local IT economy. This was mostly due to the emphasis placed on training, both in the area of customer service as well as in back office IT training to handle the customized US software produced.

Recently, there has been a new wave of interest in a computer software industry in the Caribbean following the advent of Open Source Software (OSS). OSS has been advocated as an attractive option for developing countries on the grounds of flexibility, local adaptability and costs. By definition, OSS lends itself to creating an ICT environment of highly customized applications that cater to the needs of developing countries. With OSS the programming code used to create software is available for inspection, modification, re-use, and distribution by others; hence software applications can readily be adapted to address local needs. In turn, the software development process and upgrading can also help cultivate domestic talent that flows into a long term sustainability, realizing spillovers into the rest of the economy and upgrading jobs.

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Recently, there has been a new wave of interest in a computer software industry in the Caribbean following the advent of Open Source Software (OSS). OSS has been advocated as an attractive option for developing countries on the grounds of flexibility, local adaptability and costs. By definition, OSS lends itself to creating an ICT environment of highly customized applications that cater to the needs of developing countries. With OSS the programming code used to create software is available for inspection, modification, re-use, and distribution by others; hence software applications can readily be adapted to address local needs. In turn, the software development process and upgrading can also help cultivate domestic talent that flows into a long term sustainability, realizing spillovers into the rest of the economy and upgrading jobs.
local computer software industry servicing both the private and public sectors. Furthermore, local participation also lead to reduced external expenditers on ICT.

The OSS industry in the Caribbean is still quite fragmented. Data on the number of firms operating in this sector does not exist, and information pertaining to the ICT sector overestimates the number of companies in the sector since it includes a wide range of operations from telemarketing to IT training to more sophisticated business segments. Currently, there are a lot of individual efforts and small scale businesses, but no one really knows what the other players are doing in the region. Most of these companies are sole proprietorships, targeting both the private and public sectors. Trinidad and Tobago, Barbados, and to a lesser extent Jamaica, are the most highly developed markets for OSS.

However, a few of these players are trying to foster collaboration throughout the industry to create a forum to share innovative ways in which OSS has been used, and to reduce the amount of duplication and replication across the region. For instance, in St Lucia a local OSS company along with the government and The Open Group, is organizing a series of discussion seminars centered on possible OSS alternatives for private businesses. The idea is that these seminars will develop into a Caribbean-wide conference on the use of OSS, and create a forum where industry participants can share their practices and experiences.

OSS industry participants must also collaborate to promote the growth and potential of this industry to their end customers. At present, the private sector in most of the Caribbean is not aware of how ICT can be utilized to improve their bottom line. Studies have shown that most Caribbean SMEs use ICT to perform simple applications such as word processing, spreadsheets and other administrative functions with little use of customized software applications or complex networks. Furthermore, trade associations or support institutions for SMEs have failed to upgrade their technical assistance for companies in areas where ICT use can lead to considerable efficiency gains. Hence, there is a clear rationale for companies in the sector to come together and educate the local market on the potentials of more complex ICT deployment and local computer software industry servicing both the private and public sectors. Furthermore, local participation may also lead to reduced external expenditers on ICT.

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software development. Small indigenous companies are the right market for local programmers. Chef Pepper, a start-up gourmet delivery company (see pg. 57 for further description) has recently made such an investment, having a local programmer create CRM and logistics back end system customized to its customer base for less than one-tenth the price of established off the shelf software.

Business opportunities also exist in the computer software industry for various complementary services. The offshore market, as well as other niche business segments, can be served from the region as long as there is a clear strategy that entails targeted efforts to develop the industry. For the local software market to develop, some initiatives to improve the business environment, particularly for start-ups, are necessary such as:

- training and development of a critical mass of skilled labor in ICT;
- educating private sector leaders about the benefits that ICT can have on the business' bottom line;
- financing small to medium enterprises for growth; and
- helping local firms understand the service and product needs of their domestic market and the subsequent market opportunities, and tapping them.

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4. ICT-ENABLED CLUSTERS

When firms compete globally with value-added products that they can sell to sophisticated consumers, they spur economic development. These firms are able to employ more workers and pay them a higher salary. In turn, they invest in training to make sure that they are able to continuously innovate, and provide the premium products or services that spur the firm’s growth. This virtuous cycle is the one that firms and clusters in prosperous nations engage in.

So how do we measure the effect of ICT on improving firm level productivity and innovation? Most of the existent metrics have concentrated on the inputs: Access and Ability, instead of the actual productive use of these technologies. Measuring the impact of ICT is not easy, particularly in developing countries where data is scarce. Often the true benefits of ICT investments are diffused and entrenched within firms’ operations. There are five major ways that ICT can have a positive influence on productivity and innovation, which in turn can spur growth and prosperity. These are the ways in which countries and their firms look for in the deployment of ICT. The next section will explore how ICT create benefits, and how firms and institutions in the Caribbean are exploiting those benefits, and the constraints they face in doing so.

4.1 COMMUNICATE WITH CUSTOMERS AND FORWARD INTEGRATE

Economists define competitiveness as productivity: how well a firm uses its resources for economic gain. While this is true and valid in an academic sense, it does not signal how a firm improves the productive use of resources. Economists view the world from the perspective that assets drive operations, which in turn drive customer selection. Successful businesses take that idea and turn it on its head. Competitive firms identify demanding and underserved customers, developing methods to effectively service those customers, and use their knowledge of their customer needs and operations to drive their asset choices.

Firms compete and win by embedding unique insights about customer needs and preferences into the products they produce and the channels they engage to sell those products. Those insights, which are a fundamental component of competitive firms and clusters, can only be captured through interaction with and feedback from customers. It is not hard to see that the closer a firm is to its end customers, the easier it is to understand those customer needs and to control the processes which create those products.

ICT provides a quick and cost-effective way to keep that communication active and permanent. From transactional communication to buy or sell, online surveys of customer preferences, to shared systems that allow firms to monitor customer behavior, and preferences and react to them seamlessly, ICT is at the crux of these exchanges. The ability of operational managers to incorporate this type of data and react to it immediately (instead of procuring market research studies for hundreds of thousands of dollars that provide last year’s data) will provide small, as well as established companies, the necessary edge to remain competitive.

Tourism

In tourism, the historical perspective has been to provide a great experience to visitors. The new paradigm for competitive tourism is not just to deliver an unforgettable vacation experience, but to manage the complete customer experience that includes planning, selection, on-trip, and post-trip events. In order to control and understand all the experiences a visitor has that occur “off trip”, the cluster needs to forward integrate through partnership or new business ventures into areas that allow them access to customers and are key points in the complete tourism experience.

Tourism is a cornerstone of every Caribbean country’s economy. In most, it is the primary service industry. When done successfully, the multiplier effects of tourism touch every citizen in the country potentially in multiple ways: directly through jobs or business opportunities, indirectly through additional purchasing power of the local population, or ICT-Enabled Clusters.
Tourism is a deceptively easy industry to diagnose. While the strategies to create differentiated and sustainable tourism are complex and difficult to implement, diagnosing a failing or failed industry requires only three data points: 1) number of arrivals, 2) length of stay, and 3) expenditures per day. These three data points, multiplied together, give the most basic and accurate indicator of the industry's direct economic impact on the economy: total tourism expenditure. When one of these variables is elevated in importance (either through industrial policy or for political reasons), the impact on the industry can be devastating.

The following figure shows average expenditure per day and average length of stay for some Caribbean countries where data was available. As illustrated, countries like Dominican Republic and Jamaica have seen expenditures per day and average length of stay decrease in recent years. This may indicate that the country is moving more to a cruise ship type of tourism offering, since cruise ship visitors generally go from one island to the other and spend significantly less in-land. Others like Barbados and St Vincent have seen expenditures per day decrease but length of stay increase, which could point towards a move to all-inclusive or enclave tourism.

The most successful tourism models (in terms of both direct and follow on-tourism receipts) come to countries that embrace a "total island experience". These countries strive to make the entire country the destination, and in doing so, create a wide range of experiences from which a visitor may choose, and create a vast number of opportunities for the local population to serve and profit from the tourism. This model requires a moderate and consistent level of infrastructure and security throughout the country, and maintaining the model requires a robust tourism cluster that coordinates efforts for mutual benefits.

Many countries have seen the large-scale introduction of cruise ship tourism to their islands. While cruise ships can play an important role in creating a balanced industry strategy, high concentrations of cruise ship tourism has had a significant positive impact on arrivals but a more than offsetting negative effect on both length of stay and expenditures per day. Additionally, highly concentrated cruise ship tourism has had a significant negative impact on tourism, tending to concentrate the impact of tourism into government landing fees and a few service providers near the berth. Bahamas or Jamaica provide an important lesson to all countries about the risk of excessive dependence on cruise ships, but also points the way to how ICT can play a central role in recovering from that overdependence.

As illustrated above, countries such as Bahamas, Jamaica, or even Belize more recently, have attracted further indirectly through services and experiences available to citizens that are sustained because of the tourism industry. When done poorly, tourism exploits cheap labor, provides little or no economic multiplier to the larger economy, and exports the majority of created wealth offshore. For the most part, the Caribbean is a case study for poorly done tourism. Where tourism has been done successfully, there are bountiful case studies for how the industry is quickly migrating to poor tourism practices.
Unique Jamaica

In June 2003 approximately 100 members of the Jamaican tourism industry came together under the Jamaica Cluster Competitiveness Project (JCCP). This project sought to develop an alternative segment of the Jamaican tourism market. Its primary goal was to unite cluster members in customer and marketing alliances that would allow them to compete internationally for high quality visitors. This was essential, for the majority of ICT cluster members are SMEs (for example, a 10-room environmental eco-retreat with revenues of approximately US$300,000/year is a tour operator with four buses, and a small restaurateur among many others). Jamaica is chiefly known as an all-inclusive sun, sea and sand destination; these larger resorts tend to produce revenues in the figures, and certainly virtually all the services guests consume during their visits to the island.

During the course of the first year of work together, cluster members developed a strategy to target international travelers. To do so, these firms came together to produce several custom tour packages, offering jointly the services of the various cluster members. International four operators were segmented and promising relationships were established.

In order to begin offering the packages, however, the cluster had to determine a marketing position and launch a marketing campaign. It supplied for and was given a (guaranteed) US$60,000 marketing grant from the United Kingdom’s Department for International Development (DfID) to market its packaged offerings under the campaign “Unique Jamaica”.

While this budget is large relative to the members’ own (much of which has been passed with these grant funds), it is tiny relative to the US$15 million marketing budget of the Jamaican all-inclusive chains’ standards, or even the Jamaican Tourism Board’s annual $20 million plus. To make the appropriate international connections, technology was essential.

The Unique Jamaica campaign, therefore, was centered on an e-tourism web site (www.explorejamaica.org), complete with an interactive map providing guidance to the traveler, links to appropriate tours, and individual property information. By forming relationships with the right four operators of the site (through customer surveys and trade shows), this online tool has already produced package and individual bookings.

Today the cluster is using part of its DfID grant to develop a customized booking engine for the web site. This will allow overseas agents and individual visitors to fully customize their vacation packages. The net result is not only a reduced booking cost, but a new tailored selection and booking experience. The Unique Jamaica vacation begins with a trip to the web site, and provides an overview, education, and unlimited flexibility.

The ICT application is ideally suited to the cluster of Caribbean businesses. Recognizing that a visitor’s experience in choosing a vacation is an integral part of that vacation, the cluster used the Internet to strengthen its connection to future guests. As its product offering has grown, the demographics have perfectly matched the new booking engine. Finally, by using digital customer surveys to solicit feedback from appropriate agents and tourists, the cluster was able to design its site to best meet the needs of the customers they most valued.

The result is a cluster enabled by the use of ICT. The appropriate application of relatively straightforward but powerful tools has built on the core value proposition of the cluster itself. In the process, Unique Jamaica has now a long way toward creating competitive advantage for 100 SME members of the Jamaican tourism industry. While the company is still in its early stages, visitors have already started to arrive, at the premium rates we have established, and approximately dozen new international specialty tour operators have been retained.

masses of cruise ship passengers. The primary story here is how understanding distribution channels can avoid these problems in the future, and b) how a migration strategy back to land-based tourism requires ICT in numerous ways (i.e. market research, marketing and customer communication, direct distribution/channel management, on-island coordination, etc.)

Top 5 Cruise Ship Destinations in the Caribbean (Arrivals by Country in Thousands)

Source: Caribbean Tourism Association

% Change in Cruise Ship Arrivals - Top 5 Growth Destinations

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Likewise, over the past two decades, many Caribbean nations have sought to create enclaves of tourism that offer all the amenities and security demanded by international visitors. These enclaves were to serve as incubators and catalysts of expanding tourism across the country. The Dominican Republic, for instance, in the late nineties in the northern coastal Dominican town of Sosua, there existed a bed-and-breakfast and residential tourism sector. This form of tourism offers travelers the experience of living in a rural Dominican home, providing opportunities for cultural exchange and learning. Such an offering creates a uniquely Dominican experience that cannot by imitated by other islands. In addition, the wealth generated from this tourism model is more widely distributed than in the enclave model. However, many of these hotels were forced out of business when large enclave hotels in the surrounding area of Puerto Plata were built and a price war ensued.

As this example demonstrates, Dominican Republic or Jamaica can reclaim a more total-island tourism model, they must offer experiences that compete favorably against the enclave option. The non-enclave model, such as the Sosua example, which includes offerings such as residential, adventure and eco-tourism, offers more diversity and local color than the enclave. But to win, it must also compete on ease of the experience. Though there are inherent challenges to compete with enclave tourism on issues such as security, there is opportunity for residential and non-enclave segments to increase the convenience of their experience through the application of ICT. Information of rates and accommodations of large enclave hotels is more readily available to visitors, mostly through the Internet. The application of ICT would not only lower informational barriers to non-enclave tourism, but it would allow for greater coordination between the traveler and host, the host and supporting services (travel agents, transportation providers, tour guides) as well as improve internal hotel logistics. This in turn would help non-enclave hotels to offer a more convenient “worry-free” vacation experience.

For instance CocoLaPalm, a small 75-room non-enclave hotel located in Negril Jamaica, has implemented information technology systems to improve its internal logistics and service delivery as well as the hotel’s marketing and promotion efforts. Prior to this upgrade, reservations were done manually and the process was very laborious in planning, controlling, and executing room allocations for new arrivals. Inventory of linen and other housekeeping products were improperly controlled and losses were numerous. In addition, an unorganized inventory control system caused the hotel to close its restaurant and send guests to neighboring hotels for meals. As a result the hotel suffered from a reputation of poor service translating to a low number of return visitors. Since the implementation of an IT operations system, which controls room allocation, cash and inventory control, the hotel has witnessed a significant decline in these problem areas. The hotel now runs three internal restaurants, bousin an average annual guest return rate of 35% and has won accolades from the local hotel association for service provision.

In addition to improving service delivery, CocoLaPalm has also used ICT to improve its promotion and marketing efforts. In 2001, the hotel rebuilds its website specifically to improve the convenience of booking rooms online and planning vacations. It also installed web cameras in the pool and beach areas, giving visitors to the site a real-time glimpse into the CocoLaPalm experience. However, the majority of countries in the Caribbean region have simply failed to keep up with changing preferences and demands of international travelers, resulting in a decline in these problem areas. The hotel now runs three internal restaurants, bousin an average annual guest return rate of 35% and has won accolades from the local hotel association for service provision.

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The Dominican Republic exemplifies this model. The more toward enclave tourism has been rapid, and came at a cost of the pre-existing model. For instance, in the late nineties in the northern coastal Dominican town of Sosua, there existed a bed-and-breakfast and residential tourism sector. This form of tourism offers travelers the experience of living in a rural Dominican home, providing opportunities for cultural exchange and learning. Such an offering creates a uniquely Dominican experience that cannot by imitated by other islands. In addition, the wealth generated from this tourism model is more widely distributed than in the enclave model. However, many of these hotels were forced out of business when large enclave hotels in the surrounding area of Puerto Plata were built and a price war ensued.

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travelers often relying too heavily in the enclave all-inclusive model. Understanding and serving the unique demands of tourists is the key to both sus-
taining and growing the industry. In almost every action, from market analysis to service provision, ICT has an important role to play.

The Customer Experience Model

While these archetypal experiences are important to demonstrate the results of tourism choices, the Tourism Customer Experience Model offers a system-
atric way to understand the range of choices that any destination must consider in developing a sustainable competitive strategy. At each step in the model, ICT plays an increasingly important role in enabling coun-
tries to capitalize on tourism opportunities. In the Planning Stage, a customer identifies potential products or services that may satisfy his/her needs, and the criteria by which to evaluate which products or services to purchase and use. ICT can play countless roles in enabling this model

In the Selection Stage, a customer evaluates potential products or services in the option set, selects one by making a purchase or purchase commit-
ment, and forms his/her expectations for the use of the product or service. Providers attempt to influ-
ence the evaluation process to the client's advantage, make it possible for the customer to purchase the selected product or service, and attempt to set the client's expectations appropriately for using the provider's product or service.

In the On Site Stage, a customer experiences the product or service and seeks help if any problems arise. Providers deliver the intended product or service and provide service recovery if the customer experiences any problems.

In the Post-Trip Stage a customer evaluates the use of the product or service, forms an opinion about whether to use the same or different product or service in the future, and decides whether to rec-
ommend the product or service favorably or unfavorably to others. Providers attempt to learn the customer's evaluation of the product or service, attempt to motivate the customer to use one of the client's products or services in the future and help the customer to share favorable recommendations with other potential or current customers.

ICT can play countless roles in enabling this model of tourism as the case study of Bermuda demonstrates below.

Bermuda Escapes: Tourism Customer Experience Model and ICT

Bermuda tourism has suffered in recent years. Twenty-year trends show decreasing numbers of visitors from new and easy-to-reach

Caribbean competitors; decreasing length of stay as Bermuda's primary U.S. markets came to perceive the island as a "shoulder" season;

spend per day as hotels migrated to lower cost wholesaler distribution channels in efforts to prop up volume. The tourism destination of Bermuda was no longer relevant. One hundred years of people flocking to the island had blinded them to the

to the September/October and April/May periods that are peak times for Bermudian; and decreasing

ICT-Enabled Clusters 67
Role of Country Tourism Agencies

As depicted by the few examples above, the tourism industry is bound to benefit from further ICT integration among players to create this “total island experience.” ICT and the Internet have become ubiquitous in the promotion of the tourism product—to the point that an Internet presence and online interactivity are prerequisites for survival. Under these pressures, most hotels will eventually adopt the technology, and more quickly that others industries. The real test will be whether whole industries and competitive players can come together to provide more integrated and seamless experiences. Tourism Boards and promotion agencies can play a role in promoting this view, providing technical assistance and starting to link up members together. While their role has been historically in advertising, the generic campaigns are become less effective as the advertising experiences are delivered with the actual experiences, or are too generic to escape falling into the low cost, sun & sea experience.

Tourism is the most obvious and significant opportunity for increased customer intimacy and forward linkages. Yet this type of thinking, and applications of ICT, can be applied to most industrial clusters of the Caribbean.

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Recognizing the value of the Blue Mountain brand abroad, Country Traders decided to sell a branded finished product to overseas consumers who were willing to pay a premium for a top-quality blend. To connect with these customers the company developed an online ordering system. Orders are received online using a basic software package and fulfilled with the services of an international courier company. Although Country Traders does not have the capital to develop a sales or distribution network in North America, the Internet has provided the company with an effective distribution channel into an entirely new market. In so doing they have broken away from the constraints of the local market and cut out numerous parts of the export value chain thereby capturing a much larger share of the total value-added for themselves, and by extension for Jamaica. Although online sales account for only 4 percent of total sales they account for 8 percent of profits. It is therefore not surprising that Country Traders is moving to grow this segment of their business, and other distributors and farmers in the sector are looking to follow their lead.

4.2 IMPROVELOGISTICS

Most firms incorporate technology to gain efficiency and productivity only when they have to in order to survive. The same is true in many ways in which ICT can improve logistics, and the greatest benefits occur when they are incorporated both inside the organization and as a way to transact across the value chain. The firm can also benefit from deep inter-organizational integration of the way the organization works: incorporating efficient back-up systems and knowledge-sharing databases, the use of word processing, spreadsheets, etc. The time devoted to think through and strategize around new work flows, business logistics and process re-engineering is usually deficient and numerous projects have fallen short because they fail to consider this “big white elephant”.

Governments also have much to gain from efficiency gains and improved logistics, given the widespread services they provide to their communities. Through the Special Envoy of the Prime Minister, Technology, Trade & Investment, Barbados presents a good example of pushing reforms through. However, efforts in this sphere receive particular pushback as the fear of causing “redundancy” makes efficiency not a politically popular effort. Here’s a telling example: there is a post where government officials are employed to cut bushes and make sure that the citizens are taking care of their lands. When a property is uncared for the official needs to go back to the office instead of determining the owner of the land. This is a note that calls for their attention. When a technology company offered a GPS system that would incorporate ownership maps allowing them to determine the owner immediately, the response from the officers was “what will happen with our ‘Travel Pay’.” The human side cost of improving efficiency is the first thing to cut back to save such programs. The government’s paternalistic role in society has created a culture where causing redundancies is close to immoral, so training programs need to go hand in hand with such initiatives.

Nonetheless, there are telling examples across the Caribbean, ranging from manufacturing and services to agrishare, of companies that have used ICT to transform the way they do business. For instance, Chef Pepper, is a start-up launched by two brothers that saw a business opportunity in exemplar customer service in the meat delivery business.
Agriculture is another area that could benefit much from ICT logistics improvement, both to internally transform the practice as well as to transact across the value chain. The agricultural sector continues to show a mix of levels of performance in the region and has been taken over by the service sector in most countries. Despite the fact that large-scale agricultural production may not be a viable option for the region, there are attractive niches that could benefit from a more agribusiness entrepreneurial approach (areas such as sauces and spices, Sea Island cotton, premium coffee and rum).

In agriculture, where most of the players are small and fragmented, there is an important benefit to coordinating cluster firms to make mutually beneficial initiatives happen that would otherwise require hefty investments if undertaken by a single player in the market. In this sense, ICT has a crucial role in allowing these single entrepreneurs to work together.

### Chef Pepper

Chef Pepper, a small Dominican startup which supplies high-end hotels, restaurants and private households with imported high-quality steak, sausage, and shrimp, uses ICT to assure the efficiency of its business logistics. When asked why they succeeded in the commodity business of meat distribution, the founders’ answer is “while many claim to be reliable, we actually are — and that makes the whole difference in the market.”

The operators are in close communication with U.S. suppliers and local customs brokers via the internet and cell phones. Bulk orders are placed on demand and shipped by air. Their integrated IT systems also help Chef Pepper reduce inventory costs. It relies on First Out FIFO (First-In, First-Out) inventory control systems that assigns each item a electronic bar code which allows the tracking of the products to final spoilage, and tells each delivery boy exactly which piece of sausage to pick from cold storage. When an order is taken by their customer service unit and inputted into their management software, their outsourced transportation provider is automatically notified of the order by electronic pager. Simultaneously, a map with directions to the client’s location from the head office is printed out using GPS, a local Dominican service, and provided to the transporter upon pickup. Chef Pepper guarantees that the order will be delivered to household clients within 45 minutes of the time of order.

Most of their systems have been locally developed and customized. The customer relationship management (CRM) software was coded by a local programmer and costs merely 10 percent of the similar U.S.-made alternatives. Through this software, they track purchases and segment customers to customized promotions. These components have allowed Chef Pepper to deliver high-quality service at competitive costs in the Dominican marketplace. Their main competitors for household businesses are the few gourmet meat stores such as Omaha Steaks that do not deliver, nor meet their prices, variety or customer service.

Chef Pepper’s use of ICT extends beyond their logistics. The business has also undergone a targeted Internet promotion campaign that increased their customer base and revenues for its household customer segment with minimal cost. Chef Pepper purchased email list for their target customer segment, upper-class Dominicans in Santo Domingo, and designed an electronic flyer with product promotions. The emails also directed potential clients to their website. The immediate results of the Internet campaign were dramatic. In one month, Chef Pepper was able to increase its client base and revenues 34 percent and 134 percent respectively. Their 3-month compound average growth rate over the email promotion was 48.3%, as compared to 33.6% before the promotion.

However, as will be discussed in later sections, Chef Pepper’s growth, like most (AMC)’s across the Caribbean, is limited in its ability to obtain financing of competitive rates. With its current facilities, it is unable to meet the demand of their commercial clients. In addition to importing the meat from abroad, Chef Pepper also adds value to the product by trimming each cut to the appropriate weight to be served in restaurants (8 and 12 ounces). This service saves hotels money and excites client satisfaction. Hotels serve car loans larger than displayed on the menu to the consumers because they pay for the meat by the weight. If they see smaller cuts, customers expect to see the meat of their commercial clients. Chef Pepper would need major investment in storage and meat proportioning capacity. However, high interest rates from Dominican banks ranging from 14.27 percent makes the less viable. So far all growth has come internally and they are considering some Angel investors. They are considering doing meat packaging for U.S. chains, as well as branded, seasoned cuts. However, it will be difficult for them to register to a medium/large business and grow outside of the Dominican Republic without significant financing.
together and deal with some of the evidenced coordination failures.

For instance, the agricultural sector in Jamaica is beset by numerous inefficiencies. One of the most costly is the lack of supply and demand information among the players in the industry. For a wide variety of commodities like peppers and cassava, numerous market prices will exist at any one time. Moreover, the lack of market information frequently leads to periods of under and excess supply. Farmers are particularly hard hit by their lack of market information. In many cases farmers are simply too far from the end-consumer to know the market price. These inefficiencies have been addressed by middlemen who work to match supply with demand. Although they have helped to increase the efficiency of the market, they have pushed farmers further away from the end market.

To address the information asymmetries that exist in the market, a pilot project was launched last year to test the ability of text messaging and voice messaging services to convey market information to farmers on a daily basis. Although the incidence of poverty is relatively higher in rural communities cell phone use is quite ubiquitous throughout the island. Farmers were very enthusiastic about the initiative—particularly the voice messaging service. A locally based consulting firm is now exploring how the service can be launched across the island on a for-profit basis.

Manufacturing

Manufacturing in the Caribbean is small relative to other sectors of the economy. There is a large disparity between the rate of adoption of ICT and process re-engineering that is highly dependent on scale. Benchmarking studies conducted with over 100 manufacturing SMEs have shown that the majority fall short in terms of a weak foundation of their practices. Several weaknesses were identified in areas such as marketing and promotion, product development, engineering and innovation, and plant and equipment, etc. Some of these issues are directly related to post technological adaptation. Those that try to break this mold have seen the benefits, more so in niche products sold at a regional level. Gale Force Windows is a good example of such innovation of a good business idea benefiting from proximity to its market.

Antigua Gale Force Windows

Profile and ICT use

GAL FORCE is a company based in Antigua that builds high-end, hurricane resistant windows and doors. The company was founded in November 2001 by Hugh Marshall, former Minister of Trade in Antigua, and last year had a turnover of US$ 750,000 with a healthy margin of approximately 30 percent. Mr. Marshall saw the opportunity to create a high quality, low cost product to sell to neighboring Caribbean countries in the growing business of construction. The plant is small but fully digitized with state of the art machinery imported from Germany. The company has built relationships with architects throughout the Caribbean built in the box and in the country. The majority of customers are from neighboring Caribbean countries in the growing business of construction.

The company sells 70 percent outside of Antigua, mostly in Trinidad, Barbados, St. Lucia and Grenada. They have recently received orders from Puerto Rico. They have a sales team that travels to the location to install the windows and a small office in Dominica with technicians to assist in implementation, and fully connected to the factory in Antigua.

Their main market is hotels and high-end bistros. They have also been approached by the local government for their involvement in the construction of a new hotel. The company has also been approached by a local consulting firm to consult on their growth strategy.

The company has a website where companies and architects can connect with them online, but have yet to implement a purchasing system online. The main reason is that their customers are not ready to purchase online, and since it usually involves large orders and significant capital expenditure, personal contact and relationships are part of the sale process for the company. They have recently won contracts for the construction of a new hotel in Grenada. They have also been approached by a local consulting firm to consult on their growth strategy.

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Improving Competitiveness and Increasing Economic Diversification in the Caribbean

Challenges: Financing and Skilled labor

The company has taken advantage of the incentives law passed in 1976 that allow tax free importation of materials for the first 10 years of a new company. Initial financing of $1.8 million comes from a local bank, on a 13.5%, interest rates of making it hard for the company to break even. Furthermore, the company required U$1.8 million in new materials to start production. As Mr. Prone explained, “It is easier to get a loan for a car than to start a business. Banks feel it’s more secure because that’s salvageable. The banks do not consider Gale Force equipment as collateral. This is probably the most difficult aspect of making the business succeed, after financing at reasonable costs”.

The company has also felt the scarcity of high-skilled, driven professionals in the midst of marketing and sales. Most of the professionals that recruit are explained. They have also sought help from an NGO (actually, an ex CIDA organization) based in Dominica to get the capacity development training to fill the offices to the production facilities. However, the capacity training was never approved, according to management, because decisions on hiring are made far away from the field and are not in touch with the needs of the entrepreneurs.

Services—Tourism and Others

The service sector is a prime arena for logistical improvements, not only to provide excellent customer service, but to enter new and more complex niches. There is an untapped opportunity in the niche tourism for Caribbean islands: the Wellness Center concept. As a natural extension of specialized tourism offerings, wellness centers can offer a range of services from a spa or retreat experience, to rehabilitation facilities for people undergoing surgical procedures or retiree complexes as the ones seen in Florida or Southern Spain.

For instance, the rehabilitation facilities or retiree complex option will benefit from two of the region’s assets: the already well-developed tourism infrastructure and the vast supply of manatees that currently go to the US or UK for higher paying jobs. The development of specialized communications infrastructure with international health care providers (telemedicine) has been crucial, especially for many of the smallest islands that have limited number of medical specialists. Finally, transportation companies, hospitality, and other supporting services that need to accommodate the needs of this customer segment should be up to par.

One of the challenges this hospitality offering would have to surpass is the issue of trust, particularly as it relates to serving patients that have undergone surgical procedures. The perception is that Caribbean countries have poor health care sectors and will not be able to cope with premium post-hospitalization services. One option is to partner with US hospitals or universities and have this seal of approval to overcome this issue.

A recent experience in Barbados illustrates the opportunity of not just high-end hospitalization services, but the potential for cutting edge research facilities in-island. Barbados is currently in the process of setting up a wellness center to carry out research and offer regenerative therapy using fetal stem cells. The Institute of Regenerative Medicine in Barbados is being set up as a joint venture between American investors, Ukrainian stem cell researchers and the Barbados Tourism Authority. The Barbados institute will import stem cell preparations from Ukraine, and offer specialized therapy for US$25,000 per patient. The project is still in its initial phase, and as of mid-November, 2005 the center had treated three patients. The idea is to start by focusing on people suffering from autoimmune diseases, diabetes and neurological disorders. The current US policy to not provide federal funding for certain stem cell research provides an excellent opportunity for near shore facilities for US patients and researchers. These types of opportunities require a fast reaction to get the first mover advantage and be able to attract future investment in this lucrative and high-potential area.

Other medical opportunities, such as Telemedicine, offer improved efficiency and service for the local population.

91 Financial Times (2004)
92 Ibid
**Telemedicine in the Caribbean**

**Industry Background**

Across the Caribbean, many countries are underserved in health services due to a lack of medical specialists. Furthermore, these patients that seek second opinions or need specialized diagnoses have to incur tremendous costs and be clinically stable to travel to the site of a medical specialist.

Given these conditions, telemedicine is a very attractive option for the region. In essence, telemedicine is medicine offered at a distance and that entails the use of audio, video or computer technology to investigate, monitor and manage patients who are geographically separated from a medical specialist. It also allows doctors to collaborate on patient care, participate in diagnostic procedures, keep abreast of current practices and enhance medical care to Caribbean people at an affordable cost.

**The Caribbean Medical Imaging Center (CMIC)**

The Caribbean Medical Imaging Center (CMIC) is a privately owned radiology center in St. Vincent and the Grenadines. The company was set up in 1998 by Dr. R.E. to provide a range of radiology services from X-rays and CT scans, to ultrasound and mammography imaging. To date, the center is able to offer over 10–15 patients for ultrasound services and 5 a week for mammograms. The cost of a CT scan is between USD 6,400 to USD 6,800.

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**Opportunities and Challenges**

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**The Leisure Marine cluster in the Caribbean**

The Leisure Marine cluster in the Eastern Caribbean is another activity that has the potential to provide a competitive and differentiated product, both as a niche market of the tourism industry and for complementary services like pleasure boat building and maintenance operations. There is a growing demand in North America for lower-cost pleasure boat building locations and for more sophisticated Caribbean service facilities.93 The eastern Caribbean is poised to capture this niche market by becoming a destination for the leisure marine community. These islands have become destinations for high-end yachts because of their pristine beaches and untouched nature. Locations such as Antigua & Barbuda, St. Lucia and St Vincent & Grenadines already have a critical mass of skilled craftsman, specialized businesses and boat building facilities. Others, like Tobago & Trinidad and Tobago are poised to compete on comparative advantages, being the only protected port in the Caribbean outside the annual path of hurricanes.

In the United States alone, yachting is a $50 billion dollar industry that has doubled in the last 10 years. In most Eastern Caribbean countries, yachting is the 2nd most important element of Tourism, even more profitable than Cruise Ships.94 Although the contribution of this cluster to overall economic activity has been difficult to assess due to shortcomings in data gathering, it has been estimated that yachting expenditures amount to less than 1 percent of GDP in countries like Trinidad and Tobago, to more than 3 percent of GDP in places like Antigua & Barbuda and St Vincent and the Grenadines (refer to figure below). Furthermore, of the average expenditure per boat going to these islands, over 90 percent goes to food, accommodations, entertainment, etc., which is an indication of the potential tourism revenue that can be accrued for one island. These countries collect a substantial amount of the approximately US$75,000 per week that most high-end cruise boats spend inland on fuel, dockage, electricity, food, etc.95 And these...
Expenditures do not include what goes into hiring the crew, which amounts to close to US$15,000 per month for a six-crew motor yacht. Likewise, direct and indirect employment in the yachting industry is considerable; ranging in some cases to more than 5% of labor force.

The industry as a whole, however, lacks a common vision of its potential and of its relative competitive position. The greatest challenge is for these islands to realize that their main competitors are not neighboring islands but other sailing destinations such as the Mediterranean. The customer experience in yachting and marine-based tourism unfolds in what may be called the “island hopping” adventure. This requires seamless inter-island collaboration in areas ranging from customs and boat facilities management to site specific entertainment. However, regular consultation among the Eastern Caribbean on the management and upgrading of the leisure marine experience are rare if non-existent. The industry is currently highly fragmented and firms could benefit from more corporate depth in areas such as market development, improvement of the production process, training and the necessary linkages and coordination in the supply chain. With regard to this last area, ICT could help upgrade this tourism offering by allowing flawless coordination of logistics among different service providers.

One area that could largely benefit from improved logistics is immigration and consultation between port authorities. To date, yachts complain of the cumbersome procedures that exist in many islands for clearing vessels and passengers. In turn, many yachts override customs clearance resulting in loss of government revenue from yachting permits. ICT could be a potent tool for harmonizing rules and standardizing and simplifying immigration procedures across islands, while at the same time making the in-island experience as seamless as possible. Another area where ICT usage can increase coordination is in the services provided by charter marinas and boat yards. The majority of marinas and boat yards in the Caribbean offer a one-stop shop for repairs, with quality monitored by each marina. ICT could help upgrade these services by allowing

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**Estimated Employment in the Yachting Sector**

<table>
<thead>
<tr>
<th>Country</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua &amp; Barbuda</td>
<td>838</td>
</tr>
<tr>
<td>Dominica</td>
<td>N.A</td>
</tr>
<tr>
<td>Grenada</td>
<td>250</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>350-575</td>
</tr>
<tr>
<td>St. Vincent &amp; Grenadines</td>
<td>152</td>
</tr>
<tr>
<td>Trinidad &amp; Tobago</td>
<td>1100-1600</td>
</tr>
</tbody>
</table>


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**Estimated Yachting Expenditures as a % of GDP**

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua &amp; Barbuda</td>
<td>9.5</td>
</tr>
<tr>
<td>Dominica</td>
<td>2.8</td>
</tr>
<tr>
<td>Grenada</td>
<td>3.5</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>6.1</td>
</tr>
<tr>
<td>St. Vincent &amp; Grenadines</td>
<td>15.2</td>
</tr>
<tr>
<td>Trinidad &amp; Tobago</td>
<td>24.6</td>
</tr>
</tbody>
</table>

Geographically based clusters are still fundamentally valued by allowing the free and instant transport of digitized knowledge and insight. Although popular examples of ICT overcoming distance are often those of international coordination of production, or the ability to communicate with customers half a world away, in many countries overcoming the physical distance is not nearly as important as the elimination of a barrier to competition. Imagine the local impact of a fishing boat on its way to shore using a cell phone to learn which harbors are offering better prices, or which markets have greater demand for the types of fish in the holds. No longer are producers beholden to middlemen who simply broker information; they negotiate in a market closer to perfect information, with each party benefiting in proportion to the value they contribute.

The Caribbean has a significant number of companies and sectors that are using ICT to expand their market base, overcome geographic distances and coordinate their business processes. The rate of deployment and usage, however, varies significantly across industries. The service sector appears to be the most progressive one in this realm, especially consulting and offshore financial services. To compete, most of these companies have deployed advanced ICT to manage client services and provide “virtual headquarters.”

4.3 MAKE DISTANCE IRRELEVANT

The distance between buyers and sellers has been a strong comparative advantage since commerce commenced. Historically the time and effort required to move physical goods reduced—and often prevented—distant competition. As barriers to movement and shipment reduced over time, the difficulty of coordination and communication still gave the edge to local firms. With the advent of global ICT, distance has ceased to become a barrier to entry of competition in all but the most niche products or markets. ICT have made it easier and cheaper than ever to stay in touch with customers and suppliers, and as knowledge and insight have become an increasing percentage of the ‘value-add’ of products, ICT creates significant value by allowing the free and instant transport of digitized knowledge and insight.

Geographically based clusters are still fundamentally important (in fact, some argue even more so). However, this importance is increasingly on the interconnections of the human capital and other factors on the supply side, as opposed to the proximity to final markets.

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### Caribbean Offshore Financial Centers

**History**

The first offshore center was established in 1936 in The Bahamas to provide management services for wealthy international clients. Thereafter, operations expanded into other British overseas territories such as Anguilla, the British Virgin Islands, and the Cayman Islands. As these centers benefited from employment creation and revenues coming to governments and authorities, other Caribbean countries looked to replicate these efforts. In 1982, offshore companies began setting up operations in Antigua and Barbuda, followed by a handful of companies in Grenada. Dominica started promoting the sector in 1999 and just recently, St. Lucia and St. Kitts have introduced legislation to attract offshore companies.

**Benefits of the Industry**

The economic benefit of offshore centers has been largely analyzed, generally for the early entrants The Bahamas and Cayman Islands. The contribution of this sector to overall employment and government revenues across the Caribbean and dependent on the offshore operators that set up. In general, “barrier” companies, which are entities registered in a jurisdiction but with no real physical presence, only pay annual fees but do not employ an insurable number of workers. Most employment in the type of operations is linked to the number of entities that are created. In the Bahamas, overall employment is significant the high number of employees in Antigua and Barbuda is associated with the inclusion of internet gaming. However, less collected by central governments were small relative to GDP in most of these territories, with only Antigua, the BVI and Cayman Islands receiving more than 1% of GDP.
There are other niche services sectors that are exclusively reliant on ICT as a way to compete without geographical borders. An interesting example is the gaming industry in Antigua.

The online gaming industry has developed in places like Antigua and Dominica, thanks to the welcoming regulatory environments of these countries. ICT providers are able to upgrade to the industry’s requirements. Gaming is a US$6 billion industry worldwide, and virtual casinos are operating without geographical borders. There are essentially two types of services: one is “Virtual Casinos,” where all games are played online (black jack, poker, slot machines, etc.) and the company has a predefined hold, or margin of around 2.5 percent (this is lower than in a land-based casino, as Las Vegas which has a 3–4 percent hold). The second type is the gaming industry in Antigua.

The offshore financial services sector—the “Virtual Headquarters”

The offshore financial services sector has been at the forefront of ICT usage both in terms of developing a sophisticated interface to communications with their client base, as well as to diversify the financial offerings provided. Companies are now providing “virtual Headquarters,” built around sophisticated technical components, secure software applications and aggressive investment strategies. Clients can also take advantage of effective asset management tools and brokerage services. The development of this sector has also created increased demand for supporting and administrative services, such as customized software applications, specialized strategic and legal consulting, knowledge management and bank compliance services, etc. However, the extent to which this sector is served by local services is fairly limited. Although accountants and lawyers are regularly employed locally, most offshore companies outsource sophisticated IT requirements to North America or Europe. As was discussed in 3.3 (software development), the availability of skilled labor is the major obstacle for the development of the highly attractive market of supporting services.

Source: IMF Working Paper (2002). N/A: employment figures were not available for those set of countries.
of service is Sports Books that allow customers around the world to bet on real-life sports and other events. These require much more highly skilled labor to run, including risk managers who are experts on the different sports to be able to calculate the starting odds. In this type of betting, margins vary between 4.5 percent in football, to (in certain soccer combinations.

Running these businesses involves a number of ICT services from web design and interactive web tools, to setting up secure systems for online transactions.

Gaming Industry in Antigua: How to Make a Good Business Go Away

History
The gaming industry began as an illegal activity in many small Caribbean islands. Antigua’s government approached this situation as an opportunity and entered the industry early on. In 1994, the government took the necessary steps of legalising, licensing, and regulating the industry. The development of the industry was undertaken in a very pro-active manner; the country invited experts from around the world to work on legalising and operating the industry. The Development of the Industry was undertaken in a very pro-active manner; the country invited experts from around the world to work on legalising and operating the industry.

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The manufacturing and agro-processing sectors have had fewer positive examples of using ICT. Yet, facing the problem of repositioning and transforming the agricultural sector, ICTs have a very important role in the marketing of products and also the search of new niche markets.

For instance, Erica’s Country-Style is a US$200,000 agribusiness company in Kingston, St Vincent that manufactures pepper sauces and other food snacks for the Caribbean and US markets. Founded more than 20 years ago by Erica McIntosh, the company employs close to 10 people in its Kingston facility and buys produce and raw material from more than 200 farmers across the island.

Three years ago, the company decided to launch a website to make its products known to a wider market (www.ericascountrystyle.com). Soon after, customers in the United States started sending orders and requests for product information through the Internet. Initially, orders were processed from St Vincent and delivered by courier; however, the costs associated with delivery were disproportionate to the US$2.00/bottle retail price. Hence, since April of 2004, the company has partnered with an agent in the US that distributes other types of Caribbean ethnic foods and serves the company’s North American market.

Currently, customers wishing to buy this product need to contact the company’s agent in New York to have orders processed. However, Ms. McIntosh foresees that by end of year online transactions will be possible. Most of the delay has been associated with the website developers, a Canadian based company handling the project. Nonetheless, after launching the website three years ago the company went from having no presence in the US market to receiving 7–10 percent of its revenue from this new market segment.

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Currently, customers wishing to buy this product need to contact the company’s agent in New York to have orders processed. However, Ms. McIntosh foresees that by end of year online transactions will be possible. Most of the delay has been associated with the website developers, a Canadian based company handling the project. Nonetheless, after launching the website three years ago the company went from having no presence in the US market to receiving 7–10 percent of its revenue from this new market segment.

While this example is on a small scale, it holds widespread promise for the regions of Erica’s throughout the Caribbean.

**Services**

Trinidad and Tobago offers another example of how the use of ICT could leverage its domestic energy sector to develop world-class upstream industries and related services, such as geological consulting. There is an important opportunity for Trinidadian firms to target this profitable market of sophisticated multinational firms with services such as geological modeling, deep-sea drilling, and construction of drilling platforms. There are also some important opportunities around specific oil-industry software and data processing that can be developed, given proximity to sophisticated and local expertise in the upstream activities. For instance, BP spends $2.00/bottle retail price. However, since April of 2004, the company has partnered with an agent in the US that distributes other types of Caribbean ethnic foods and serves the company’s North American market.

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The sources of industry information have proliferated in the Internet, and they are investing more and more in their reputation as reliable sources of information. Savvy entrepreneurs can use these online sources: from company descriptions, industry reports to customized research to understand what similar companies are doing around the world, and how to stake out the right competitive positioning.

The music industry in Jamaica went through this exercise. Musicians and producers in Jamaica were seeing their music rise in international charts, but were unable to either control that process, or reap the benefits of their talent. An in-depth analysis of their competitive positioning in world markets allowed them to create a new offering that reversed these trends. They looked at markets growing in reggae bands and worked to advertise their production services to them, instead of seeing them as competitors. At the end of the day, the more Jamaica is involved in music production, particularly if international bands come to Jamaica for their services, the more financial benefits they could accrue from the popularity of their music.

Jamaica Music Production—Jamaica Signature Beats

Founded in August 2004, Jamaica Signature Beats (JSB) is a non-profit company comprised of Jamaica's most talented music producers, mixers and producers that have made hiring music professionals to produce technical and creative expertise in the international music industry. The project was initiated by the Jamaica Cluster Competitiveness Project financed by USAID, EDF and the Jamaica Exporters Association. JSB member music professionals have recorded artists of the highest level and music in Jamaica. The organization has grown over the past three months into an exclusive network of more than 30 members who have the ability to produce and record a range of musical genres, which include Reggae, R&B, Jazz, Hip Hop, Rock, Country & Instrumental. JSB has applied ICT to address both the market distortions caused by low trust and communication and the informational barriers that result from the industry's fragmentation. The most tangible example of JSB application of ICT is through its interactive website, www.jamaicasignaturebeats.com. To connect with international clients, the website provides an online showcase of the services provided by JSB (mixing and logistical services) in addition to extensive credentials of its respective members. The website allows international labels and bands interested in recording in Jamaica to browse through the various bio pages displaying the history, genre of expertise, and track record of the member. JSB has also developed and lists a 24-hour hotline for each member, providing prospective clients a real taste of the talent and expertise of Jamaica’s music professionals. The information热了 the fact that recording in Jamaica had been considered a risky proposition in the past, making it difficult for producers to promote themselves. Furthermore, besides giving prospective clients samples of the products of JSB members, the website also displays JSB's membership criteria helping ensure the client of the quality of the service provided. JSB has an operational arm in charge of checking that members comply with standards of quality, service, and security. They provide detailed contracts to technical and creative experts to make sure that producers and studios are on time, fulfill contracts, and provide great music for their clients.

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In addition to the website, JBS embarked on a public relations campaign with the assistance of Ruder Finn International that relied heavily on the Internet. JBS electronically distributed, in press releases to over 200 print publications within the United States at marginal cost to the organization directing prospective clients to their interactive website. This campaign has resulted in a dramatic increase in traffic to the site and members being called from international clients interested in coming to Jamaica to record.

JBS represents the first initiative coming out of the Jamaican music industry in which various players have cooperated and shared information to produce a unique offering to the market. Hence, the value added through the application of ICT surpasses its marketing efforts. The creation of the JSB website facilitated the building between industry players as it served as a public platform through which each member shared information and worked together to bring business to island. The cooperation and ability to discovery a one-stop-shop of music production was greatly facilitated by technology tools. ICT was not used merely as a marketing strategy but as a platform through which the mental models of how business was conducted within the industry was changed for the better.

The JSB campaign and information gathering was done intensively through the use of ICT. Also members of the industry realized that the need to be connected, have an email account, record and share music digitally was imperative to increase their revenue potential.

Manufacturing

More traditional manufacturing companies are even more at risk of quickly losing their competitive positioning by the lowering of logistics costs and new low-cost destinations entering the market. S M Jaleel in Trinidad and Tobago (refer to Case Study on page 71) and Gale Force Windows (Case on page 59) were two companies in the Caribbean aware that understanding their competitive positioning was imperative in entering their market.

Investigating the competition and their shortcomings, Gale Force Windows saw an opportunity. Traditionally, construction companies imported their materials from Miami, but once they arrived they found the windows would not fit correctly. Gale Force focused on the regional markets and made sure it could be price-competitive with international vendors, despite importing most of its materials from Germany, United States, and Canada.

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4.5 ENHANCE TRANSPARENCY

In the same way that private sector enterprises use ICT to manage operations or have a better understanding of customer needs, government can use ICT to operate more efficiently and cost-effectively in the services it provides to firms and citizens.

Governments can generally use ICT in three broad ways to improve their service delivery. First, governments can improve the transparency of the business environment by making data widely and freely available. They can manage data and speed up transaction processing times through the use of technology such as database management and data entry systems. Making information readily available to citizens is a more being adopted broadly, from descriptions of legislation, tax codes, bills proposed in parliament to interactive transactions, applications for documents, benefits, etc. Often, governments have begun to utilize this process natively to find themselves forced to improve their processes and outputs given the public scrutiny possible through the Web. Secondly, governments can help the business community make more informed decisions. For example, access to up-to-date data such as tax rolls and unpaid taxes can give firms and individuals data to evaluate the quality of potential partners, customers or suppliers. Thirdly, data integration and sharing of information between government agencies can improve the quality of services. When a person registers for an identity card with a government agency, that individual can automatically be shared with agencies such as the revenue authority (for tax purposes) and the interior ministry (for census planning).

The yet underused benefit of ICT in the Caribbean is in increasing civic engagement: creating virtual town halls where citizens can quickly provide government officials feedback on policies, references and similar initiatives.

Undoubtedly, government can be a very powerful force in instigating change throughout the economy. Given the size of government intervention, this is especially true in the Caribbean. Posting online proposals or creating online procurement sites forces companies that want to win government contracts to become technologically adept.

104 Case study is drawn from OTF Group interview with SM Jaleel’s CEO, Mohamed Aleem and data provided in Wignaraja, G. (2004). 105 Industry Quarterly (2002)}
Antigua's Own Government Local Loop

Antigua is not a part of the Eastern Caribbean Telecommunications Authority (ECTEL), the regional agency that provides advice and makes recommendations on telecommunications matters, and thus makes recommendations on telecommunications matters, and helps to manage the sector in its five-member states of the ECS. This is because the government has a joint venture with C&W and owns the local loop network. In many countries this would lead to exorbitant rates and bureaucratic procedures to manage the service for Internet. Antiguans claim this law has made their ability to transition to e-government much easier than neighboring countries, by not having to negotiate with private companies and pay high rates to connect their offices and put services online.

Their plans are ambitious: to connect all government departments and schools to its central data bank. In the past, after paying C&W & Wireless over US$500,000 for Internet access, only a few privileged had access to connectivity yet since 2001, they managed to connect all government buildings through high-speed cable, leased line and dial-up to the Internet, and give every government employee access to the Internet. Their website www.antigua.gov.egis publishes updated information on parliamentary decisions, laws, and next year forms will be uploaded for free. In all provinces, there is an Office for the Enhancement of Services. This new policy formally states that public sector action can have information readily available to inform their projects. For example, if the Ministry of Education is interested in knowing how many schools to build in the next five-year period, he can find online the birth registers, number of schoolchildren's children, immigration numbers, etc. to make informed decisions.

This is the right vision; however, Antigua is still lagging behind its neighbors in computerizing the government, and putting in place government websites, with static organizational or political information. An enhanced presence is defined by an increased number of government websites with more specialized information with links to other government pages. These pages also include e-mail addresses and search engines. Countries enter the interactive stage when their government websites allow for formal interactions like discussions areas and the search of specialized databases. This stage is also characterized by users' ability to download and submit relevant forms and applications. Countries with transactional presence have government websites that allow users to complete and secure transactions such as obtaining visas, passports, birth and death records and licenses. Users can pay for these in online in addition to utility bills and taxes. Digital signatures can be recognized for procurement of government contracts. Lastly, seamless or fully integrated e-governments allow for instant access to any service in a "unified package." Thus, where ministerial and departmental lines are of no consequence, has yet to be attained.

Countries like Argentina and Mexico have successfully made that transition. Despite the important potential, government is also the hardest sphere in which to implement these types of reforms. As in St. Lucia (FINMAN), young, technologically savvy people were hired to change all the back-end systems, but did not have authority to change work processes in any other government department. This stage is also characterized by users' ability to download and submit relevant forms and applications. Countries with transactional presence have government websites that allow users to complete and secure transactions such as obtaining visas, passports, birth and death records and licenses. Users can pay for these in online in addition to utility bills and taxes. Digital signatures can be recognized for procurement of government contracts. Lastly, seamless or fully integrated e-governments allow for instant access to any service in a "unified package."
by any country. The following table illustrates the stages for the Caribbean countries included in this study as well as countries more advanced in their efforts such as the United States, Ireland, and Singapore.

However, there are significant challenges that Caribbean governments face as they attempt to transition their information and services towards a fully integrated Web presence. These include:

- High cost of telecommunications
- High cost of necessary software and hardware
- Low access to the Internet
- Low levels of ICT education and/or targeted training
- Cultural resistance to ICT adoption

### Median Clearance Time at Ports

<table>
<thead>
<tr>
<th>Country</th>
<th>Time (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua</td>
<td>N/A</td>
</tr>
<tr>
<td>Bahamas</td>
<td>1.79</td>
</tr>
<tr>
<td>Barbados</td>
<td>1.25</td>
</tr>
<tr>
<td>Belize</td>
<td>1.26</td>
</tr>
<tr>
<td>Dom Republic</td>
<td>1.26</td>
</tr>
<tr>
<td>Dominica</td>
<td>N/A</td>
</tr>
<tr>
<td>Grenada</td>
<td>N/A</td>
</tr>
<tr>
<td>Guyana</td>
<td>1.22</td>
</tr>
<tr>
<td>Haiti</td>
<td>N/A</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1.31</td>
</tr>
<tr>
<td>St. Kitts</td>
<td>N/A</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>N/A</td>
</tr>
<tr>
<td>St. Vincent</td>
<td>N/A</td>
</tr>
<tr>
<td>Suriname</td>
<td>1.63</td>
</tr>
<tr>
<td>Trinidad</td>
<td>1.34</td>
</tr>
<tr>
<td>United States</td>
<td>2.98</td>
</tr>
<tr>
<td>Singapore</td>
<td>3.11</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Source: Clark X., Dollar D and Alejandro Micco 2002
Progress towards overcoming these challenges will require the steadfast commitment of Caribbean governments.

High telecommunications costs and low educational levels are formidable obstacles facing e-government initiatives in the Caribbean. The United Nations survey revealed that the Caribbean has the second lowest regional e-government capacity index\(^{110}\) (1.34), second only to Africa (0.84). However, countries with similar e-government capacity indices have attained different stages of e-government. As illustrated in figure X, despite having an e-government capacity index (1.33) lower than the regional average Jamaica is one of the most advanced in its stage of e-government. It is worth noting that Jamaica was also one of the first movers in the region in terms of telecommunication liberalization and is one of the most advanced in its ICT policy frameworks. Jamaica liberalized its telecommunications in 2000, with the passing of its Telecommunications Act.\(^{111}\) Similarly, the Bahamas liberalized Internet provision as early as 1996 and successfully passed a telecommunications act in 1999. The Bahamas has an e-government capacity index above the regional average in part due the early commitment of its government to create an environment conducive to ICT usage. The table below shows metrics conceived by the UN that compare a government's potential progress in e-government given its access to connectivity, and its actual achieved progress.

In contrast, Suriname, with one of the highest e-government capacity indices in the region, has an e-government effort that is still in the emerging stage. Analogously, Suriname is the least advanced in telecommunications infrastructure and ICT policy implementation. This observation implies that the vision of the government and its commitment to creating an environment that is supportive of ICT technology is vital to the success of e-government efforts.

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\(^{110}\) The UN e-government capacity index is comprised of measures of a country's web presence, telecommunications infrastructure, and human capital.

The following recommendations encompass areas the Caribbean private and public sectors, and multilateral organizations, should focus on to improve the business environment and the ability of firms and individuals to reap the benefits of ICT usage.

### FACILITATE ACCESS

<table>
<thead>
<tr>
<th>Area</th>
<th>National</th>
<th>Regional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telecommunication Legislation and Policies</td>
<td>Liberalization of telecoms services legislation (facilitation and execution)</td>
<td>Liberalization of international cable connections, and availability of new licenses</td>
</tr>
<tr>
<td>International High Speed Connections</td>
<td>Liberalization of international cable connections, and availability of new licenses</td>
<td>Regional high speed networks along island chains.</td>
</tr>
<tr>
<td>Wi-Fi, WIMAX Networks</td>
<td>Support competition in alternative technologies to provide broadband to businesses and consumers.</td>
<td>Leverage support from private sector partners and international donors for pilot projects to determine the viability of the market.</td>
</tr>
<tr>
<td>Alternative Telecommunications Networks</td>
<td>Explore prospects and policy issues regarding use of alternative telecommunications networks</td>
<td>Offer expanded communications through ECTEL and CARICOM.</td>
</tr>
</tbody>
</table>

### IMPROVE ABILITY

<table>
<thead>
<tr>
<th>Area</th>
<th>National</th>
<th>Regional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training in Applied ICT Business Skills</td>
<td>Develop training programs in ICT applications based on private sector demand (e.g., skills identified by firms, trade associations, etc.)</td>
<td>Utilize regional certification and regional trade associations to ensure quality and relevance of training programs.</td>
</tr>
<tr>
<td>ICT Relevant Skill Set</td>
<td>Establish partnerships between academia and the private sector (e.g., Dominican Republic partnership between the government, local universities, and New York’s Stevens Institute)</td>
<td>Encourage regional partnerships between academia and the private sector.</td>
</tr>
<tr>
<td>Tertiary Education &amp; Vocational Training</td>
<td>Applied science and technology needs be a more relevant part of national efforts and outcomes of tertiary education and technical and vocational training, as well as entrepreneurial training to support local innovation</td>
<td>Disseminate and discuss at a regional level.</td>
</tr>
</tbody>
</table>

### SUPPORT SERVICES FOR FIRMS

<table>
<thead>
<tr>
<th>Area</th>
<th>National</th>
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</thead>
<tbody>
<tr>
<td>Business Incubators</td>
<td>Support business incubators and high-risk financing mechanisms that encourage entrepreneurship and local innovation</td>
<td>Foster Caribbean-wide networks of SMEs to enable knowledge sharing (e.g., regional business incubator network).</td>
</tr>
</tbody>
</table>
**REGIONAL HARMONIZATION IN KEY POLICY AREAS**

**International Compatibility in Legislations**
- Develop national e-legislation in compliance with regional and international legislation and best practice.
- When possible, move towards international compatibility in e-legislation and replication of best practice.

**Internet Governance Legislation**
- Revise existing and draft new legislation to uphold the validity of electronic transactions and records.
- Harmonize across the Caribbean in compliance with internationally accepted standards and regulations.

**Financial Framework for Electronic Transactions**
- Deploy a financial framework to support electronic transactions.
- Support a regional financial framework to enable electronic transactions.

**Knowledge Transfer/Exchanges**
- Promote public and private sector discussions on the impact of legislation on business.
- Promote knowledge exchanges with other countries to learn about different models of legislation and train regulators on international best practices.

**INTERNATIONAL COMPATIBILITY IN KEY POLICY AREAS**

**TECHNOLOGY CLUSTERS MUST MAKE BUSINESS SENSE**

**Assessment of Capital Investments**
- Feasibility studies, performed in close cooperation with the private sector, are essential to ensure that investments in technology clusters make business sense, are demand-driven, and guided by a strategic intent.

**Monitoring and Evaluation of Technology Projects**
- Regularly evaluate the impact of investments and government incentives in ICT-related projects— Including project outcomes, knowledge transfers, return on investment (ROI), employment generation, etc.

**STRENGTHEN NEW SERVICE AND NICHE MANUFACTURING**

**FDI Attraction**
- Create public and private sector partnerships to attract investment in promising sectors.
- For smaller economies, pursuing partnerships in tandem with neighboring countries could help to create an attractive market opportunity.

**Innovation and Entrepreneurship**
- Reward entrepreneurship and innovation through contests and government incentives.
- Support regional innovation workshops and networking events.

**Industry Clusters**
- Strengthen industry collaboration (clusters) to facilitate access to technical assistance, and address market failures.
- Collaborate on inter-island business clusters such as yachting and tourism.

**Increase ICT Business Usage and Adoption**
- Facilitate collaborative initiatives that improve access to crucial business inputs and work with governments for targeted support (e.g., the Irish Industrial Development Authority).
- Leverage regional trade associations to showcase best practices and replicate the private sector on how ICT can be effectively utilized to improve productivity (e.g., Caribbean Tourism Organization providing tourism data).
1. Facilitate Access. Access to technology, as noted earlier, is essential for firms and clusters to compete globally. There has been much written about basic and specialized access, including a variety of metrics to determine how and whether a country has a competitive technology platform. They all boil down to one thing: can a businessperson get on the Internet and talk on the telephone with reasonable reliability, and at a cost on par with his/her global competitors? In the Caribbean, the situation is suboptimal in this regard, with some of the highest connectivity prices in the region, and in general, uncompetitive telecommunication markets. For instance, outbound calls are more expensive than inbound calls, Internet density is still substantially lower than in the United States, Singapore, and New Zealand, and the cost of high-speed Internet is exorbitant.

The liberalization of telecom services is taking place in mobile telephony, but the process needs to be sped up. In parallel, new technologies like Wi-Fi or Wi-Max (longer-range wireless technology) need to be encouraged and widely embraced. Most countries continue to grapple with the problems of putting in place effective telecommunications regulations and moving forward with the liberalization process (for example, Trinidad and Tobago, Guyana, and Belize among others, are facing these delays). Hence one of the main imperatives is to set clear deadlines for the completion of liberalization in countries that are still pending, and set up statutory bodies that will lead and instill continuity in the process of reform. The creation of a telecommunications authority is also an incipient stage in most of these countries and their technical competencies (i.e., standards, competition law, accounting regulation, etc.) are still deficient. Further liberalization will largely hinge on the competence, technical capabilities and independence granted to these authorities so that issues such as interconnectivity, rate-setting and investment incentives in telecoms are set to mimic, as close as possible, a competitive model.

Providers of international connectivity for data and voice as well as fixed lines are in most of the Caribbean de facto monopolies, because there is no alternative submarine cable network. There is also little economic incentive to invest in underground cable as a second comer in the business in small islands like those in the Caribbean. While current high prices might make it appealing, it is not hard for a regional monopoly like Cable & Wireless to drop local prices and drive competitors out of business. Thus, so far, all land-line connections from fixed telephones to broadband access required for Internet applications, are bound to use the incumbent’s network at their set price.113

Some Internet Service Providers (ISPs) are already providing Wi-Fi access to the Internet, but the rate of adoption and relatively slow speed offered are still hampering this technology’s full potential. As pointed out in a recent study by Eurostrategies, a European-based consulting company, the quality of Wi-Fi service in the Caribbean is still held back by inefficient control of the frequency spectrum and by providers waiting until more competition is in place to increase speed so as to always be just faster than its competitors. Governments can create incentives to encourage the entry of more competitors, particularly in Wi-Fi technologies, and help them drive adoption among the population at large.

Pilot projects initially funded by multilateral organizations and the government should be expanded to provide connectivity at greater speeds to the broader community. For instance, Jamaica, with the auspices of USAID, has been studying the possibility of adopting the Last Mile Initiative, which is a global program to expand the access of communication technologies to a wider scale of the population in emerging markets. One of the components of this program is the innovative deployment of low-cost technologies such as Wi-Fi and Wi-Max in remote communities and SME firm networks.

These technologies, however, are usually adopted by the larger and more efficient firms first, and then replicated through the economy. Thus, speedy regulation change, incentives for new competitors and technologies, and protection from unfair competitor behavior from the incumbent will have the most profound impact.

112 Refer to Recommendation 4—Regional harmonization of Key Policy Areas Related to ICT—for a detailed review of what OECS is doing in this realm
113 Eurostrategies (2004)
114 Ibid
2. Improve Ability. A key input for improving the region’s competitiveness is the upgrading of knowledge and human capital. In this sphere, the Caribbean considerably lags in relation to any developed country. This should become an immediate priority for governments since it is well known that any investment in upgrading intangible assets requires both practice and patience over the long-term to fully materialize and translate into improved productivity and an economy of a country. First, the gap in tertiary education is worrisome. While primary and secondary enrollments are in line or on some instances above other developed countries, enrollment rates at the university are less than 10 percent in almost every country (except for Dominican Republic, Barbados, and Bahamas that have upwards of 20 percent enrollment). In response to this, governments have created a series of programs and technical schools and have made program accreditation easier and courses more flexible. These are efforts in the right direction, yet, businesses still point to difficulties in getting the right local skills set for their businesses. Some highlight deficiencies in general managerial and marketing skills as stated by the CEO of Galle Force Windows in Antigua: “We don’t have a problem recruiting for our factory and providing training, what we need are managers that can open new markets, and interact with our customers to create new opportunities for the business.” Others, say the skill gap is especially true in more complex direct IT jobs, data processing, and software development and maintenance, as noted by the chief operating officer of an Internet gaming company: “We are obliged by law to hire locals at a ratio of 3:1, while that is not a challenge given our competitive pay, the real experts in IT and gaming are coming from the UK and Australia.”

In this sphere, there is a clear role for government and private sector organizations to provide targeted support. Governments should support private training schemes by providing well-designed training incentives for firms, through fiscal incentives, matching grants, or subsidies as appropriate. Furthermore, governments and international donors should support training agencies that provide demand-driven programs and prove to have private sector linkages. These linkages can be created through internships and exchanges that bring back relevant market knowledge into the classroom. Private sector organization and trade associations can also spearhead these efforts by working in conjunction with the government to make training relevant to the labor market and to inform SMEs of the training options available to them. For example, a call center in St. Lucia spent over US$ 10,000 for a specialist to train its staff. This type of training could be organized by trade associations to encompass more players and spread out the costs.

Local universities need to connect to the needs of the private sector, to understand the demands on future employees and to engage in applied research. Currently, most of the successful businesses are led by Caribbean people that have returned after receiving advanced degrees or having job experiences abroad. More partnerships, like the one spearheaded by the Dominican Republic’s government, local universities and New York’s Stevens Institute, need to be replicating to improve the quality and applicability of local degrees. Applied science and technology need to be a more relevant part of tertiary education and vocational training. Government institutions and international donors can help mediate these partnerships and sponsor conferences to share and prior advances in areas of science and technology. One of the major challenges in the Caribbean is extending training to smaller and medium-size firms that currently are much less likely to use formal training. Small firms are more constrained by resources, lack of knowledge about training and its benefits, and labor turnover than are larger firms. There is a rationale for the government to subsidize firms that provide on-the-job training for general skills, or to subsidize private training facilities that offer general training. Regional certification boards can also improve and harmonize regional standards in ICT technical degrees to international standards. Companies like Galle Force Windows applied to receive subsidized training from ex-CIDATech support services in St. Lucia, but were denied for unknown reasons. The wanted to train key personnel on back end IT systems so they could connect their factory to their accounting and sales offices, but could not afford to do so on their own.

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Country specific analysis should be performed in order to identify any externalities that may impede effective training (information, financial, labor, turnover, etc.) to arrive at sound training policy design. However, a general finding of this report is that small- and medium-size firms should be the primary targets for incentives to encourage training.

5. Support Services for Firms. The availability of support services and financing for start-ups, particularly in technology based businesses is almost non-existent in the region. The failure to deliver funds and technical capabilities to small ventures is the largest impediment for their growth. A conservative banking sector and exorbitant interest rates contribute to the situation. For instance, most SMEs surveyed in this study raise funds through traditional commercial banks loans, where they face upwards of 12 percent interest rates and in most cases require 100 percent collateral. This calls for the development of higher forms of financial intermediation and venture capital to develop: long-term securities, subordinate debt, equity, etc. Although this is a problem faced by the broader developing world, there are some interesting initiatives in the Caribbean worth noting.

Jamaica has begun a business incubator (the Jamaica Technology Innovation Center – TIC) that currently hosts 26 technology businesses, providing marketing and management services and modern communication facilities. Although a business incubator’s core competency is not in providing access to finance, they can be a potent mechanism for intermediating venture capital and establishing networks of investors. Although this is a problem faced by the broader developing world, there are some interesting initiatives in the Caribbean worth noting.

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Jamaica’s Technology Innovation Center (TIC)

In 2002, the University of Technology Jamaica (UTech) set up a Technology Innovation Center (TIC), formerly the Entrepreneurial Center in Kingston. The Entrepreneurial Center had been operating for more than 17 years. In 2002 TIC was established as a vehicle to facilitate the broader government’s objective of encouraging technology development in Jamaica. At this time, a new building was constructed with 26 suites to provide office space, communication facilities, and technical assistance to small technology startups that stay on premise for a total of three years.

To date, TIC has approximately 17 people working on premise, including an incubator manager, an information systems and marketing officer, an accountant, and several support employees. The incubator is overseen by a Management Board chaired by the president of UTech, a senior administrative staff from the university and senior member of the private sector. The incubator’s total budget amounts to J$45 million ($387,500), and is sourced from the government of Jamaica, CAIDA, and its own revenue generating activities. The latter contributes between 50-60 percent of the incubator’s total funds that are collected through rent and tenant fees, and consulting and training programs offered to the private and public sectors. TIC is associated with the Western Association of Colleges and Employees (WACE) and the National Business Incubation Association (NBIA) in the United States.

Currently, the incubator is fully occupied mostly with firms developing Internet-based technology and customized computer software. One client of the incubator is in quality control and another is in commercial media productions. The largest firm has 17 full-time employees and 3-3 owners, while the smallest one has 1-2 employees. Their client base is quite mixed—they serve large Jamaican companies, public sector organizations, and international businesses. Note that hold market presence almost entirely into software development or software solutions. Furthermore, new businesses start to work alongside larger organizations that work in Jamaica.

As suggested by the center’s Senior Manager, the challenges faced by the TIC fall in three areas:

1. Managing the incubator to a state of financial sustainability: currently the incubator is very heavily subsidized, but this is not envisioned in the longer run. Hence, there is a need to find other profitable complementary activities to subsidize its core business.

2. Expanding capacity and incorporating more clientele: as the concept of an incubator becomes widely publicized, demand increases and this will take place. Since the contract for a tenancy obliges companies to share their financial information, the incubator monitors company performance by looking at their cash flow, revenue performance, sales, etc.

3. Adapting to changing technological needs: as technology changes, the challenges for TIC is to adapt the incubator’s technology since new adoption is quite costly.

Furthermore, incubators can help nurture new enterprises in their most vulnerable phase until they are "graduated"—that is, they are financially viable and freestanding to leave the incubator. To do so, however, there are some guidelines that should be followed so that they do not constitute the next TF lid in the region. First, although the most common sponsors of business incubators are academic institu-

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tutions and government agencies, research suggests that the less an incubator relies on subsidies, the more successful and viable it is.\textsuperscript{126} This calls for a clear strategy of how the incubator will reach financial sustainability both by providing services to in-house startups, and training and consulting services to other private and public sector firms. As incubators move towards this path of financial viability, it is typical that their budget moves away from being almost 50 percent provided by government or multilateral organizations, to almost free standing on its own revenue-generating activities. Second, incubators should draw a clear line between financial intermediation and providing direct financial assistance to firms. The former is their actual role and they should try to set up networks of potential investors that can help raise start-up capital. Finally, the incubator should have clear and unifying performance metrics and success criteria for selecting companies and for them to “graduate.”\textsuperscript{127}

Another area for SME support is technical assistance, particularly as it relates to the use of ICT in transforming business processes. Technical assistance is in some cases easier to channel, since financing sometimes lends itself to different pressures and can become concessionary subsidies in some developing countries. Government-funded SME support agencies are rare in the Caribbean and those that exist tend to lack the strategic vision, resources, autonomy, and linkages with successful firms to promote private sector development with an ICT edge. For example, Trinidad and Tobago’s National Entrepreneurship Development Organization (NEDCO) is perceived as an instrument of political patronage or as a social development program of income redistribution. On the other hand, organizations, like the Centro de Apoyo a la Macro, Pequeña y Mediana Empresa (CAMPE) in the Dominican Republic that provide market information on numerous industries, and legal and financial advice for local businesses are important in fostering entrepreneurship. For best results, these organizations need to have (i) a clear mandate and strategic vision, (ii) the in-house technical capabilities to execute on that mandate, (iii) private sector involvement and personnel with entrepreneurial expertise to bring forth institutional legitimacy and strategic guidance, and (iv) performance metrics to assess an agency’s successful interactions with the private sector.\textsuperscript{128}

Regional trade associations could also help, not only in aggregating supply and stimulating demand (collective marketing, training, market research, etc.), but also in providing knowledge resources on how the sector could improve performance and utilize ICT. Although currently most of these organizations are not active and their use of ICT is pre-dominantly through “static” websites with entry forms, some like the Caribbean Tourism Organization (CTO) are more dynamic in this regard.\textsuperscript{129} The CTO has a Management Information System for Tourism (MIST) and an Intranet/Extranet that serves as an important catalyst to the advancement of technology platforms within this sector and as powerful market research tools for smaller firms. Cluster-based initiatives funded by donors, governments and the private sector organizations can improve the competitiveness of a sector through collective initiatives that upgrade the clusters’ products and services. These initiatives often involve improved technology platforms incorporated by the cluster as a whole, as seen by the Bermuda Escapes project that used a common and compatible IT system to track and tutor tourists’ experiences.

4. Regional harmonization in key policy areas related to ICT. As more people turn to ICT to do more of their day-to-day operations, it is imperative that legislation is kept attuned to ICT and its use. The more legislation is harmonized in the region and compatible with international standards, the greater the benefit to these economies and their attractiveness to foreign investors. Priorities in this realm include the legal enforcement of electronic documents, protection of intellectual property and privacy, further liberalization of telecommunication’s market, development of a

\textsuperscript{126} MNB uruguay.org
\textsuperscript{127} In Strock and Edige, the institutional map for private sector development is comprised of three organizations: the Tourism and Industrial Development Company (CTIIC), the Scientific Development Company (CIECI) and the National Entrepreneurship Development Company (NEDCO).
\textsuperscript{128} Berge (2000)
\textsuperscript{129} MNB uruguay.org
framework to support electronic transactions, and enforcement of electronic documents and contracts. Laws on intellectual property as it relates to the Internet— in code, data, music or other content— has important implications for businesses selling into a multi-jurisdictional world. Keeping abreast of these changes and providing up-to-date, enforceable legislation will affect the region’s ability to transact with and attract foreign businesses. Mauritius for example, has been a leader in this realm in Africa and has convinced Microsoft, Hewlett Packard, and IBM to set their regional headquarters in the island.

Ideally, the Caribbean should proceed in these reforms as a regional block. Alternatively, smaller country groups such as the OECS can proceed in tandem if it speeds up the process. To date, the OECS and the Caribbean Single Market and Economy (CSME) have taken important steps in some of these areas. The advantage of this regional alternative is two fold. First, it constitutes an immediate step towards regional harmonization of practices and legislation, which by default, will most likely guarantee international compatibility in e-practices and attempts at replicating best-practices (for instance in telecommunication’s regulation). Second, it allows individual governments to move more swiftly in the reform process, as each country focuses on facilitation and execution rather than on drafting country-specific legislation. For instance, an OECS Telecommunications Reform II Project is currently being drafted to expand the reach of the first OECS Telecommunications Reform Project and tackle some of the persistent telecom regulatory challenges in the region. Specifically, the new project is expected to build on the reform agenda and set clear guidelines to move forward along two key components:

- Bolstering support for legal and regulatory reforms that are presently underway, such as the establishment of a dispute resolution mechanism for private operators, outlining of policies and procedures for interconnection issues, and capacity building and training to strengthen the Telecommunications Authorities and the Spectrum Managing and Monitoring System (SMMs).

- Reviewing the Universal Access Policy and the establishment of a Universal Access Fund (UAF) to uphold it.

Looking forward, one of the major challenges and, if instituted, one of the new project’s major accomplishments, would be the design and implementation of regulation for interconnection pricing—physical interconnection and interconnection fees (especially fixed-to-mobile interconnection fees and mobile-to-fixed call termination charges). Interconnection pricing must cope with two problems: the market power of local access carriers in termination charges and the incentive of the incumbent not to offer interconnection to entrants (as to provide technically inferior connection between its facilities and the facilities of a competitor). Hence, the goal of the new telecom reform project’s interconnection pricing scheme is to determine a modern cost methodology and an interconnection regime that diminishes the incumbent’s market power, lowering costs and increasing competition.

In the case of the CSME, model legislation is being drafted in the area of Competition Law, Consumer Protection and Anti-Dumping and Countervailing measures. But other important issues such as intellectual property and e-enabling legislation (e-commerce regulation, electronic signatures, Internet banking and transactions and Internet crime) have not been tackled on a regional manner. The CSME should extend its reach to these areas, and donors can support these institutions in prompt implementation and regional harmonization in these topics. As the CSME proceeds as a block, it is also important that regulators be trained in technical aspects and participate in international ICT/Telecommunications workshops to remain informed of the latest trends in international standards, and appropriately customize them to the region’s challenges. This is an area where donors can help, connecting networks on the topics and encouraging the transfer of knowledge in these fast moving topics.

129 Refers to fees charged by the incumbent for completing connection that make use of the entrant’s facilities, or in the mobile-to-fixed case, fees charged by the reform agenda and set clear guidelines to move more swiftly in the reform process, as each country focuses on facilitation and execution rather than on drafting country-specific legislation. For instance, an OECS Telecommunications Reform II Project is currently being drafted to expand the reach of the first OECS Telecommunications Reform Project and tackle some of the persistent telecom regulatory challenges in the region. Specifically, the new project is expected to build on the reform agenda and set clear guidelines to move forward along two key components:

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Promoting Knowledge Exchange

Norway has been at the forefront of e-legislation. For instance, the Norwegian government has put in place an initiative to use certified signatures in electronic interaction with and state public administration. Furthermore, Norway is taking its initial success with developing countries as it relates to e-legislation. The Norwegian Agency for Development (NORAD) has been providing this kind of assistance to countries throughout the world. NORAD has worked with over 130 countries in this area and has been involved in many projects.

As Caribbean governments seek to attract new firms and FDI to their islands, they should incorporate the low-cost telemarketing model. The advantage of higher-end customer service accounts is threefold. First, customer service accounts guarantee longer-term contracts (2 years plus) because the outsourcing company has to make a greater commitment in training and development for the call center employees. Training in this sort of arrangement is more holistic, not only focusing on customer service skills, but also on company specific products, policies, and procedures and more sophisticated software programs. Second, in these arrangements the call center employees become part of the outsourcing company, improving motivation and reducing turnover rates. Finally, large companies and their clients tend to have more contact with their customer service operations offshore and many often visit call center premises on a regular basis.

Many Caribbean nations have also experimented with FTZs and Cyber Parks as the next policy trend to attract FDI and facilitate technology transfer and other positive spillover effects. However, as the case of Antigua FTZ and the Dominican Republic’s Cyber Park indicate, very seldom do the promised effects materialize and in many cases the international demand for these services to be offered in such location do not exist. These failures illustrate that these new investments need to make business sense, be demand-driven, and be guided by a carefully assessed strategic intent. For instance, the longer the commitment required by the foreign business and the greater the need for their close interaction with the local workforce and businesses (through specialized training, procurement of inputs and raw materials, etc.) the more the spillover effects can be realized. These spillovers range from positive externalities in training and human capital, to the adoption of technology and more efficient business processes.

Perhaps most importantly, the sponsors of basic telemarketing call centers misunderstood the upward cycle they were trying to create. Call centers alone are akin to maquila labor in textiles. The primary attraction is cheap rates (both on financing and, especially on labor). An industry, disconnected from a legitimate software or service infrastructure, cannot hope to migrate upward.

There are some viable opportunities in the call center business if the Caribbean can re-enter at the high end of customer service for large/well-known U.S. companies, instead of continuing with the

5. Technology Clusters must make business sense. High technology clusters do offer the potential for positive spillovers in the Caribbean. This potential is, however, extremely limited and has to date been heavily over-estimated at significant costs. For instance, as call centers became a fad throughout the Caribbean, investments were often not analyzed in a rigorous manner. Despite the use of basic technologies (telephony), many foreign companies demanded generous concessions from government promising more complex technology spillover effects and employment generation. Perhaps most importantly, the sponsors of basic telemarketing call centers misunderstood the upward cycle they were trying to create. Call centers alone are akin to maquila labor in textiles. The primary attraction is cheap rates (both on financing and, especially on labor). An industry, disconnected from a legitimate software or service infrastructure, cannot hope to migrate upward.

Tapping into developed nations that have implemented model legislation successfully is the best way to proceed. Organizations like ICANN and ITU can provide guidance on the latest standards. As these changes happen, it is important that consumers and the private sector are kept abreast of what this means for their businesses, particularly as it pertains to their legal rights and responsibilities.

6. Tapping into Developed Nations

High technology clusters do offer the potential for positive spillovers in the Caribbean. This potential is, however, extremely limited and has to date been heavily over-estimated at significant costs. For instance, as call centers became a fad throughout the Caribbean, investments were often not analyzed in a rigorous manner. Despite the use of basic technologies (telephony), many foreign companies demanded generous concessions from government promising more complex technology spillover effects and employment generation. Perhaps most importantly, the sponsors of basic telemarketing call centers misunderstood the upward cycle they were trying to create. Call centers alone are akin to maquila labor in textiles. The primary attraction is cheap rates (both on financing and, especially on labor). An industry, disconnected from a legitimate software or service infrastructure, cannot hope to migrate upward.

There are some viable opportunities in the call center business if the Caribbean can re-enter at the high end of customer service for large/well-known U.S. companies, instead of continuing with the

Promoting Knowledge Exchange

Norway has been at the forefront of e-legislation. For instance, the Norwegian government has put in place an initiative to use certified signatures in electronic interaction with and state public administration. Furthermore, Norway is taking its initial success with developing countries as it relates to e-legislation. The Norwegian Agency for Development (NORAD) has been providing this kind of assistance to countries throughout the world. NORAD has worked with over 130 countries in this area and has been involved in many projects.

As Caribbean governments seek to attract new firms and FDI to their islands, they should incorporate the low-cost telemarketing model. The advantage of higher-end customer service accounts is threefold. First, customer service accounts guarantee longer-term contracts (2 years plus) because the outsourcing company has to make a greater commitment in training and development for the call center employees. Training in this sort of arrangement is more holistic, not only focusing on customer service skills, but also on company specific products, policies, and procedures and more sophisticated software programs. Second, in these arrangements the call center employees become part of the outsourcing company, improving motivation and reducing turnover rates. Finally, large companies and their clients tend to have more contact with their customer service operations offshore and many often visit call center premises on a regular basis.

Many Caribbean nations have also experimented with FTZs and Cyber Parks as the next policy trend to attract FDI and facilitate technology transfer and other positive spillover effects. However, as the case of Antigua FTZ and the Dominican Republic’s Cyber Park indicate, very seldom do the promised effects materialize and in many cases the international demand for these services to be offered in such location do not exist. These failures illustrate that these new investments need to make business sense, be demand-driven, and be guided by a carefully assessed strategic intent. For instance, the longer the commitment required by the foreign business and the greater the need for their close interaction with the local workforce and businesses (through specialized training, procurement of inputs and raw materials, etc.) the more the spillover effects can be realized. These spillovers range from positive externalities in training and human capital, to the adoption of technology and more efficient business processes. Perhaps most importantly, the sponsors of basic telemarketing call centers misunderstood the upward cycle they were trying to create. Call centers alone are akin to maquila labor in textiles. The primary attraction is cheap rates (both on financing and, especially on labor). An industry, disconnected from a legitimate software or service infrastructure, cannot hope to migrate upward.

There are some viable opportunities in the call center business if the Caribbean can re-enter at the high end of customer service for large/well-known U.S. companies, instead of continuing with the
porate private sector firms encourage joint ventures to improve chances of success. The government and donors can help existing trade and industry associations to do feasibility studies along with interested companies before investments ensure.

Investment promotion agencies, along with the government and the private sector, need to have a vision of the country’s growth strategy and work together to execute it.

6. Strengthen new service and niche manufacturing clusters. Technology can and must be a fundamental enabler of high potential clusters of existing Caribbean businesses, such as tourism. This is an essential and largely under-appreciated imperative.

First and foremost, public and private sector partnerships should be created to attract investment in promising sectors such as wellness and rehabilitation centers, high-end tourism and yachting, stem cell research, virtual financial headquarters, medical devices, niche agriculture businesses, etc. This requires the articulation of a coherent and coordinated industry-wide strategy for those targeted clusters that have the greatest potential for growth. In doing so, there is a clear role for government and the private sector. The private sector, through industry associations or business development institutions, needs to incorporate those industry goals and facilitate collaborative initiatives that improve access to crucial inputs (training, targeted technical assistance, etc.). In doing so, they can also lobby the central government for particular infrastructure and/or institutional improvements and education and training initiatives required to push forth a sector’s new vision for the future. Governments can support these organizations by funding feasibility studies, facilitating the emergence of agencies in nascent but promising industries, and implementing the necessary legislation to support their growth.

Furthermore, credible private sector institutions or regional trade associations have a crucial role to play in countries where ICT business usage and absorption is minimal. As illustrated in this report’s Open Source case study, businesses along with development institutions can make concerted efforts to showcase best practices and educate the private sector on how ICT can improve productivity. In terms of strengthening new services and niche manufacturing clusters, there also needs to be a cognitive shift away from structural incentives as the catalysts for change. This cognitive shift entails having the private sector take the lead in developing its own future, by proactively seeking market opportunities and asking for government support only as an enabler, not as an architect, of the future. In this regard, government policies aimed at rewarding innovation and entrepreneurship are favored as well as merit-based promotions campaigns for public service servants. The government should help publicize, reward, and disseminate successful entrepreneurial activity to give Caribbean people the sense of possibility. The idea is to move away from a state of complacency and government being the caretaker, to one in which attitudes focused on competition as the force that spurs innovation, human initiatives, learning, interpersonal trust, and cooperation triumph.

134 For instance, governments or donors can support feasibility studies of industries that have the potential to export niche products or provide trade in services. They can provide information on best practices applicable to promising clusters, etc. Governments and donors should restrict their interventions to knowledge gaps that would not normally be provided for shared through the private sector because of the investments necessary is unfeasible due to the size and fragmentation of the industry, or the limited private sector’s ability to invest in knowledge.


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### 6. APPENDICES

#### 6.1 APPENDIX 1: ICT ASSESSMENT—2003

**UTI INDICATORS**

<table>
<thead>
<tr>
<th>Country</th>
<th>Total (000s) 2002</th>
<th>CAGR (%) 1997–2002</th>
<th>Per 100 inhabitants 2002</th>
<th>CAGR (%) 1997–2002</th>
</tr>
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<td>30.39</td>
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<td>Grenada</td>
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<td>4.8</td>
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</tr>
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<td>23.5</td>
<td>6.5</td>
<td>50</td>
<td>4.9</td>
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<tr>
<td>St. Lucia</td>
<td>51.1</td>
<td>6.7</td>
<td>31.95</td>
<td>5</td>
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<tr>
<td>St. Vincent and the Grenadines</td>
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<td>5.9</td>
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<td>4.9</td>
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<tr>
<td>Barbados</td>
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<td>4.2</td>
<td>49.44</td>
<td>3.9</td>
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<tr>
<td>Dominican Republic</td>
<td>909</td>
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<td>11.04</td>
<td>4.6</td>
</tr>
<tr>
<td>Jamaica</td>
<td>444.4</td>
<td>1.3</td>
<td>16.97</td>
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<tr>
<td>Trinidad and Tobago</td>
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<td>24.98</td>
<td>5.5</td>
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<td>12.37</td>
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<td>Guyana</td>
<td>804</td>
<td>7.9</td>
<td>9.15</td>
<td>7</td>
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<td>Haiti</td>
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<td>10.7</td>
<td>1.57</td>
<td>14.4</td>
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<tr>
<td>Suriname</td>
<td>78.7</td>
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<td>Lower Middle Income</td>
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<td>14.4</td>
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<td>Upper Middle Income</td>
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<td>20.03</td>
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<td>1,001,555.70</td>
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<td>17.9</td>
<td>5.3</td>
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</table>

Source: ITU 2003

---

**FIGURE 1.1 Main Telephone Lines**

Source: ITU 2003
### FIGURE 1.2 Local Telephone Network (2002)

<table>
<thead>
<tr>
<th>Country</th>
<th>Capacity Used (%)</th>
<th>Automatic (%)</th>
<th>Digital (%)</th>
<th>Residential (%)</th>
</tr>
</thead>
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<td>100</td>
<td>--</td>
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<tr>
<td>Dominica</td>
<td>72.1</td>
<td>100</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>Grenada</td>
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<td>100</td>
<td>100</td>
<td>81</td>
</tr>
<tr>
<td>St. Kitts and Nevis</td>
<td>--</td>
<td>100</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>--</td>
<td>100</td>
<td>100</td>
<td>81</td>
</tr>
<tr>
<td>St. Vincent and the Grenadines</td>
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<td>100</td>
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</tr>
<tr>
<td>Barbados</td>
<td>--</td>
<td>100</td>
<td>100</td>
<td>68.7</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>--</td>
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<td>66.3</td>
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<td>--</td>
<td>100</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
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<td>100</td>
<td>75</td>
</tr>
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<td>Bahamas</td>
<td>70.7</td>
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<td>--</td>
<td>70</td>
</tr>
<tr>
<td>Belize</td>
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<td>100</td>
<td>100</td>
<td>67.6</td>
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<td>Guyana</td>
<td>--</td>
<td>100</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>Haiti</td>
<td>--</td>
<td>100</td>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>Suriname</td>
<td>78.3</td>
<td>100</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Lower Middle Income</td>
<td>78.8</td>
<td>99.8</td>
<td>96.6</td>
<td>79.7</td>
</tr>
<tr>
<td>Caribbean Islands</td>
<td>80</td>
<td>85.2</td>
<td>94.9</td>
<td>76</td>
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<tr>
<td>High Income</td>
<td>83.6</td>
<td>100</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>Americas</td>
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<td>100</td>
<td>100</td>
<td>80</td>
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</table>

Source ITU 2003

### FIGURE 1.3 Teleaccessibility 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Residential Mainlines</th>
<th>Public Telephones</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% households with a telephone</td>
<td>per 1000 inhabitants as % of mainlines</td>
</tr>
<tr>
<td></td>
<td>Total (000s)</td>
<td></td>
</tr>
<tr>
<td>Antigua and Barbuda</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Dominica</td>
<td>72.1</td>
<td>100</td>
</tr>
<tr>
<td>Grenada</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>St. Kitts and Nevis</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>St. Lucia</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>St. Vincent and the Grenadines</td>
<td>42.1</td>
<td>100</td>
</tr>
<tr>
<td>Barbados</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Jamaica</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Bahamas</td>
<td>70.7</td>
<td>100</td>
</tr>
<tr>
<td>Belize</td>
<td>89.6</td>
<td>100</td>
</tr>
<tr>
<td>Guyana</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Haiti</td>
<td>--</td>
<td>100</td>
</tr>
<tr>
<td>Suriname</td>
<td>78.5</td>
<td>100</td>
</tr>
<tr>
<td>Lower Middle Income</td>
<td>78.8</td>
<td>99.8</td>
</tr>
<tr>
<td>Caribbean Islands</td>
<td>80</td>
<td>85.2</td>
</tr>
<tr>
<td>High Income</td>
<td>83.6</td>
<td>100</td>
</tr>
<tr>
<td>Americas</td>
<td>79.4</td>
<td>100</td>
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Source ITU 2003
### FIGURE 1.4 Telephone Tariffs 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Residential Connection (US$)</th>
<th>Residential Subscription (US$)</th>
<th>Business Connection (US$)</th>
<th>Business Subscription (US$)</th>
<th>Local Call (US$)</th>
<th>Subscription as % GDP per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua and Barbuda</td>
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<td>11.1</td>
<td>119</td>
<td>22.2</td>
<td>0.06</td>
<td>0.09</td>
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<td>Grenada</td>
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<td>85</td>
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</tr>
<tr>
<td>St. Kitts and Nevis</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>0.00</td>
<td>0.00</td>
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<td>St. Lucia</td>
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<td>8.1</td>
<td>46</td>
<td>14.8</td>
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<td>St. Vincent and the Grenadines</td>
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<td>6.1</td>
<td>37</td>
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<td>0.03</td>
<td>2.6</td>
</tr>
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<td>Barbados</td>
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<td>49</td>
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<tr>
<td>Dominican Republic</td>
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<td>12.1</td>
<td>43</td>
<td>14.8</td>
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<td>5.6</td>
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<td>Jamaica</td>
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<td>6.4</td>
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<td>15.3</td>
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<td>Trinidad and Tobago</td>
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<td>Guyana</td>
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<td>16</td>
<td>7.9</td>
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<tr>
<td>Haiti</td>
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<td>141</td>
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<tr>
<td>Lower Middle Income</td>
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<td>121</td>
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<td>Upper Middle Income</td>
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<td>6.3</td>
<td>68</td>
<td>10.4</td>
<td>0.09</td>
<td>8.3</td>
</tr>
</tbody>
</table>

Source: ITU 2003

* The % GDP per capita column is the subscription cost as a percentage of GDP per capita and is calculated based on 2002 GDP and population data.

### FIGURE 1.5 Mobile Cellular Subscribers 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Cellular Mobile Subscribers per 100 inhabitants</th>
<th>CAGR (1997-2002)</th>
<th>Prepaid subscribers (%)</th>
<th>Population Coverage (%)</th>
<th>As % of total telephone subscribers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antigua and Barbuda</td>
<td>71</td>
<td>10.16</td>
<td>34.7</td>
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<td>75.5</td>
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<td>--</td>
<td>28.3</td>
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<td>7.3</td>
<td>90.8</td>
<td>85.7</td>
<td>18.4</td>
</tr>
<tr>
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<td>17.5</td>
</tr>
<tr>
<td>St. Lucia</td>
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Source: ITU 2003

* The % GDP per capita column is the subscription cost as a percentage of GDP per capita and is calculated based on 2002 GDP and population data.
### FIGURE 1.6 Information Technology 2002

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Source: ITU 2003

### FIGURE 2.1 Key Educational Indicators

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Source: World Development Indicators
* OECS Human Development Report 2002

### FIGURE 2.1 Key Educational Indicators

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Source: World Development Indicators
* OECS Human Development Report 2002
6.3 APPENDIX 3: SECTORAL COMPOSITION OF GDP

### FIGURE 2.2 Performance in the Caribbean Secondary Examination—Percentage of Students Passing English Language and Math

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Source: OECS Human Development Report 2002

### FIGURE 3.1 Antigua & Barbuda

| Year  | Agriculture | Crops | Livestock | Forestry | Fishing | Mining & Quarrying | Manufacturing | Electricity & Water | Electricity | Water | Construction | Communications | Wholesale & Retail Trade | Hotels & Restaurants | Government Services | Other Services | Imputed Charges | TOTAL |
|-------|-------------|-------|-----------|----------|---------|--------------------|--------------|--------------------|-------------|-------|-------------|-------------------|---------------------|-------------------------|----------------------|------------------------|-----------------|----------------|-------------|
| 1994  | 3.35        | 0.93  | 0.78      | 0.07     | 1.58    | 1.34               | 2.09         | 4.08                | 3.90        | 0.58  | 8.36        | 3.36              | 4.50                | 10.86                   | 14.06                | 15.24                  | 6.36            | 5.02          | 100.00      |
| 1995  | 3.41        | 0.97  | 0.81      | 0.07     | 1.56    | 1.46               | 2.05         | 3.94                | 3.23        | 0.31  | 9.10        | 3.41              | 4.80                | 11.72                   | 16.35                | 16.25                  | 6.66            | 6.09          | 100.00      |
| 1996  | 3.40        | 0.98  | 0.78      | 0.06     | 1.58    | 1.47               | 2.02         | 3.76                | 3.21        | 0.11  | 9.58        | 3.39              | 4.50                | 11.99                   | 15.72                | 15.72                  | 6.59            | 6.78          | 100.00      |
| 1997  | 3.56        | 1.01  | 0.73      | 0.06     | 1.76    | 1.45               | 1.92         | 3.26                | 3.21        | 0.31  | 9.62        | 3.39              | 4.51                | 11.99                   | 15.66                | 15.06                  | 6.34            | 6.35          | 100.00      |
| 1998  | 3.40        | 0.95  | 0.70      | 0.05     | 1.70    | 1.47               | 1.92         | 3.21                | 3.21        | 0.21  | 10.10       | 3.39              | 4.51                | 11.99                   | 15.84                | 15.06                  | 6.34            | 6.35          | 100.00      |
| 1999  | 3.39        | 0.95  | 0.69      | 0.05     | 1.71    | 1.48               | 1.91         | 3.21                | 3.21        | 0.22  | 10.52       | 3.39              | 4.51                | 11.99                   | 15.06                | 15.05                  | 6.34            | 6.35          | 100.00      |
| 2000  | 3.37        | 0.94  | 0.71      | 0.05     | 1.70    | 1.49               | 1.91         | 3.20                | 3.21        | 0.22  | 11.04       | 3.39              | 4.51                | 11.99                   | 15.40                | 15.86                  | 6.34            | 6.61          | 100.00      |
| 2001  | 3.37        | 0.90  | 0.71      | 0.05     | 1.69    | 1.49               | 1.91         | 3.21                | 3.21        | 0.22  | 11.84       | 3.39              | 4.51                | 11.99                   | 15.40                | 15.86                  | 6.34            | 6.61          | 100.00      |
| 2002  | 3.32        | 0.87  | 0.71      | 0.05     | 1.65    | 1.50               | 1.91         | 3.21                | 3.21        | 0.22  | 12.11       | 3.39              | 4.51                | 11.99                   | 15.86                | 15.86                  | 6.34            | 6.61          | 100.00      |

Source: ECCB
### FIGURE 3.2 Dominica

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<th>Real Estate &amp; Housing</th>
<th>Road Transport</th>
<th>Sea Transport</th>
<th>Trade Services &amp; Transport</th>
<th>Other Services</th>
<th>Imperial Charges</th>
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Source: ECCB

### FIGURE 3.3 Grenada

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Source: ECCB
FIGURE 3.5: St. Kitts & Nevis

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FIGURE 3.4: St. Lucia
FIGURE 3.6 St. Vincent & the Grenadines

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Source: ECCB
6.4 APPENDIX 4: TRADE STATISTICS CHARTS

Note: Totals may not add up to 100% due to rounding.
Source: OTF Group; COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 4.2 Belize's Trade Statistics

Note: Totals may not add up to 100% due to rounding.
Source: OTF Group; COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 4.3 Dominica’s Trade Statistics

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Note: Totals may not add up to 100% due to rounding.
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics.
FIGURE 4.4 Dominican Republic’s Trade Statistics

Note: Totals may not add up to 100% due to rounding
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 4.5 Grenada’s Trade Statistics

Note: Totals may not add up to 100% due to rounding.
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics (Rev. 2)

Note: Totals may not add up to 100% due to rounding.
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 4.6 Guyana’s Trade Statistics

Note: Totals may not add up to 100% due to rounding
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 4.7 Haiti’s Trade Statistics

Note: Totals may not add up to 100% due to rounding
Source: ontheFRONTIER, COMTRADE / UN Trade Statistics (Rev. 2)
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<td>5%</td>
<td>0%</td>
<td>5%</td>
</tr>
<tr>
<td>1994</td>
<td>52%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>1996</td>
<td>51%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>1998</td>
<td>54%</td>
<td>1%</td>
<td>3%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2000</td>
<td>54%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2002</td>
<td>58%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: Totals may not add up to 100% due to rounding.

Source: OTF Group; COMTRADE / UN Trade Statistics (Rev. 2)
FIGURE 4.10 St Vincent and the Grenadines Trade Statistics

<table>
<thead>
<tr>
<th>Year</th>
<th>Materials/Metals</th>
<th>Forest Products</th>
<th>Petroleum/Chemicals</th>
<th>Semiconductors/Computers</th>
<th>Upstream Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1996</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Multiple Business | Transportation | Power Generation and Distribution | Office | Telecommunications | Defence | Industrial and Supporting Functions

Food/Beverages | Housing/Household | Textiles/Apparel | Health Care | Personal Entertainment/Leisure | Final Consumption Goods and Services

Note: Totals may not add up to 100% due to rounding.
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics.
FIGURE 4.11 Suriname’s Trade Statistics

Note: Totals may not add up to 100% due to rounding.
Source: ontheFRONTIER; COMTRADE / UN Trade Statistics (Rev. 2)
6.5 APPENDIX 5: TOP 5 EXPORTS BY COUNTRY EXPORT VALUE

**FIGURE 5.1 BAHAMAS**

- Concentration of Exports by Country Export Value

- Top 5 Exports by Country Export Value, 2001
  - Polystyrene, Its Copolymer – In Primary Forms
  - Shell Fish Fresh, Frozen
  - Gas Oils
  - Other Alcoholic Bevs, Compds
  - Common Salt, Etc

**FIGURE 5.2 BARBADOS**

- Concentration of Exports by Country Export Value

- Top 5 Exports by Country Export Value, 2002
  - Oth Alcoholc Bevs, Compds
  - Raw Beet and Cane Sugar
  - Kerosene Ird Jet Fuel
  - Misc Food Preprtions NES
  - Fixed, Variable Resistors
FIGURE 5.5 DOMINICAN REPUBLIC

Concentration of Exports by Country Export Value, 2001

Top 5 Exports by Country Export Value, 2001
- Other Ferro-Alloys
- Raw Beet and Cane Sugar
- Cocoa Beans, Raw, Roasted
- Banana, Plantain, Fresh, Dry
- Cigars, Cheroots, Etc

FIGURE 5.6 GRENADA

Concentration of Exports by Country Export Value, 2000

Top 5 Exports by Country Export Value, 2002
- Nutmeg, Mace, Cardamoms
- Flour of Wheat or Maida
- Essential Oils, Resinous, Etc
- Fish, Fish, Child, Ex Fish
- Toilet Paper Cut to Size
FIGURE 5.7 GUYANA

Concentration of Exports by Country Export Value

<table>
<thead>
<tr>
<th>Year</th>
<th>1992</th>
<th>2001</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>57.5%</td>
<td>75.5%</td>
<td>67.1%</td>
</tr>
</tbody>
</table>

Top 5 Exports by Country Export Value, 2002
- Nonmon Gold Minted, Semimfd
- Raw Beet and Cane Sugar
- Rice Hulled
- Shell Fish, Fresh, Frozen
- Aluminium Ore, Concentrate

FIGURE 5.8 HAITI

Concentration of Exports by Country Export Value

<table>
<thead>
<tr>
<th>Year</th>
<th>1992</th>
<th>1994</th>
<th>1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>47.8%</td>
<td>51.6%</td>
<td>52.3%</td>
</tr>
</tbody>
</table>

Top 5 Exports by Country Export Value, 1996
- Women's Outerwear Nonknit—Blouses
- Coffee Subst Cond Coffee
- Corsets, Bras, Etc
- Mens Outerwear Not Knit—Trousers, Breeches, Etc
- Knit Gloves, Etc, Nonelast
FIGURE 5.9 JAMAICA

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2002
- Alumina (Aluminium Oxide)
- Aluminium Ore, Concentrate
- Raw Beet And Cane Sugar
- Oth Alcohol Bevs, Compds
- Ethyl Alcohol, Denatured Spirit

FIGURE 5.10 ST KITTS & NEVIS

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2000
- Switchgear Etc
- Raw Beet and Cane Sugar
- Electrical Condensers
- Flavored Waters Non-Alco
- Pro NES of Rot Elec Plnt
FIGURE 5.11 ST LUCIA

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2000
- Banana, Plantain, Fish, Dry
- Beer, Ale, Stout, Porter
- Outerwear Knit Nonelastic—Other, Clothing Accessories
- Footwear, Baggage
- Flavored Waters Non-Alcoholic

FIGURE 5.12 ST LUCIA

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2002
- Banana, Plantain, Fish, Dry
- Flour of Wheat or Maida
- Rice Millled Unbroken
- Beer, Ale, Stout, Porter
- Flavored Waters Non-Alcoholic

FIGURE 5.12 ST VINCENT & THE GRENADINES

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2000
- Banana, Plantain, Fish, Dry
- Flour of Wheat or Maida
- Rice Millled Unbroken
- Beer, Ale, Stout, Porter
- Other, Clothing Accessories

FIGURE 5.12 ST VINCENT & THE GRENADINES

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2002
- Banana, Plantain, Fish, Dry
- Flour of Wheat or Maida
- Rice Millled Unbroken
- Beer, Ale, Stout, Porter
- Flavored Waters Non-Alcoholic
FIGURE 5.13 SURINAME

Concentration of Exports by Country Export Value

Top 5 Exports by Country Export Value, 2000
- Alumina (Aluminium Oxide)
- Nonmon Gld Unwrt, Semimfd
- Shell Fish Fresh, Frozen
- Crude Petroleum
- Banana, Plantain, Fresh, Dry
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