Lessons from global E-readiness trends of national economies

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1. Introduction

All nations in developing and advanced economies have become such extensive users of information and communications technologies (ICT) that their economic success now depends on governments' wise promotion and deployment of ICT at a national level. Most governments are committed to using these technologies to enhance their nations' competitiveness in the global economy and to improve the internal operations of public agencies. However, just as ICT can offer nations potential opportunities to improve the economic and social quality of citizens' lives, challenges to national success also exist. Effective implementation of national economic development policies that integrate economic, social and technological strategies are essential to compete effectively in the globalised economy of the twenty-first century. There is growing urgency for policy makers to incorporate ICT into economic policies because of expanding international competition for such resources as skilled labor, investment funds and trade. ICT has clearly become an important part of national strategy, largely due to remarkable improvements in various technologies over the past two decades. Also, just in the past few years, there has been a significant up-tick in the adoption of such tools as the Internet, wireless communications, as well as "computing" that is embedded in all manner of goods and services.

National economies have been evolving along a set of economic, political and social dimensions that interact with each other. Along with these traditional areas of influences on a nation's economic development, ICT has become a major element. The first competitive element of a national economy is its business environment. The expected attractiveness of general business conditions plays an important role in attracting investment funds, for example. Healthy economies have industries that frequently are "high technology" (high-tech), such as the software industry in India and the many ICT firms in Eastern China. Often, such industries lead to substantial economic growth in a national economy. However, neither India nor China yet ranks highly in terms of the quality of its business environment, compared to a majority of the nations on 'E-readiness'. A country's overall legal framework and specific laws for protecting property rights also affect the ability of an economy to compete. This entails more than simply protecting the rights of people and companies to enjoy the benefits of buildings, merchandise and patents. Nations also need to protect the rights associated with software, content and copyrightable materials.

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More recently, governments have additionally had to establish protections and policies that promote Internet use. The majority of governments have concluded that Internet use is crucial to economic and social welfare. The U.S. government invested billions of dollars to provide Internet access to every classroom in the country. Across various European countries, the cost of Internet access was lowered. In Korea, the government promoted the extensive use of broadband connections and now Koreans are the most "wired" citizens in the world. Various studies from organizations like the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN), clearly show that both consumer and business adoption of all manner of ICT has been steadily increasing over the past fifteen years [1]. Along with rising availability and affordability of ICT, the quality and reliability of ICT has improved dramatically, particularly for communications around the world. For example, e-business activity rose from being non-existent to form nearly 10 percent of all sales in the U.S [2]. As the amount of ICT business activity has increased in an economy, so too has the presence of intermediaries and ancillary services, such as IT consulting service, the deployment of new back-office processes and outsourcing of data processing. Frequently, these are evident in banking, call centers and insurance transactions, and by the development of such high-tech items as software and computer components. Findings of EIU and other studies over the past decade also point out the importance of having a social and cultural environment conducive to modern economic growth.

Specifically, the most advanced competitive economies reflect common characteristics, such as high education levels, nearly 100 percent literacy rates and extensive Internet experience for large percentages of the population. These should be considered as pre-conditions for the continued successful improvement of a modern economy. In addition, the encouragement of an entrepreneurial attitude through supportive national policies is having a profound effect on nations. This is happening today in India, China, and large swaths of Central and Eastern Europe. Ease in registering new businesses, making capital available to them and implementing supportive tax policies and incentives are examples of such initiatives. These and similar government practices, regulations and laws allow government officials to directly support their local economies.

E-readiness is a measure of the quality of a country's information and communications technology (ICT) infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit. When a country uses ICT to conduct more of their activities, its economy can become more transparent and efficient. The e-readiness rankings also allow governments to gauge the success of their ICT strategies against those of other countries, and provide companies wishing to invest overseas with an overview of the world's most promising investment locations from the perspective of e-readiness.

Implied in this measure is the extent to which the usage of communications devices and Internet services creates efficiencies for business and citizens, and the extent to which this usage is leveraged in the development of information and communications technology (ICT) industries. The ways for a country to achieve and sustain e-readiness are varied and interrelated, and are shaped by factors in the economic, political and social environment, as well as by the breadth and quality of its ICT infrastructure and the digital services that are taken up.

E-readiness is progressing around the world, but achieving it is growing more complex. Basic connectivity, for example, is no longer adequate to use the Internet efficiently; the connections must be fast, secure and affordable. Likewise, governments must demonstrate their commitment to digital development not only through broad policy, but also in practical ways, such as delivering public services to citizens and business via electronic channels. The goalposts of e-readiness, in other words, are shifting

This paper examines the trends evident in three groups of countries in terms of their E-readiness rankings between 2001 and 2008 and profiles the key characteristics and trends common to these groups. This is detailed in section 2 of the paper. Section 3 outlines some of the areas that each of these groups should focus on in order to improve their 'E-Readiness'. Section 4 of the paper concludes by setting out some guiding principles for policymakers.

2. Key E-readiness trends

The world's largest economies can be categorized into three tiers, based on the extent of ICT deployment (see Figure 1). This classification is based on the average E-readiness ranking achieved by a country over the 2001-2008 period[4]. Countries within a specific tier seem to share similar sets of political, economic, social and technological attributes, and can be broadly categorized into three tiers as follows:

• Established Leaders (or Tier 1 countries)–
The most extensive and mature users of ICT

• Rapid Adopters (or Tier 2 countries) –
Countries which have made rapid progress in ICT development in recent years and are beginning to challenge the most advanced economies or the Established Leaders

• Late Entrants (or Tier 3 countries) –
Countries that started the new century with inadequately developed social, economic, political and legal infrastructures, and where ICT influences a very small part of their economies.

[4] Some of the countries in the E-readiness rankings were introduced over this period and so their average rank is based on whatever data is available. For example, Bermuda was included in the rankings for the first time in 2006, so it's average is based on it's ranking for 2006-2008.

Figure 1

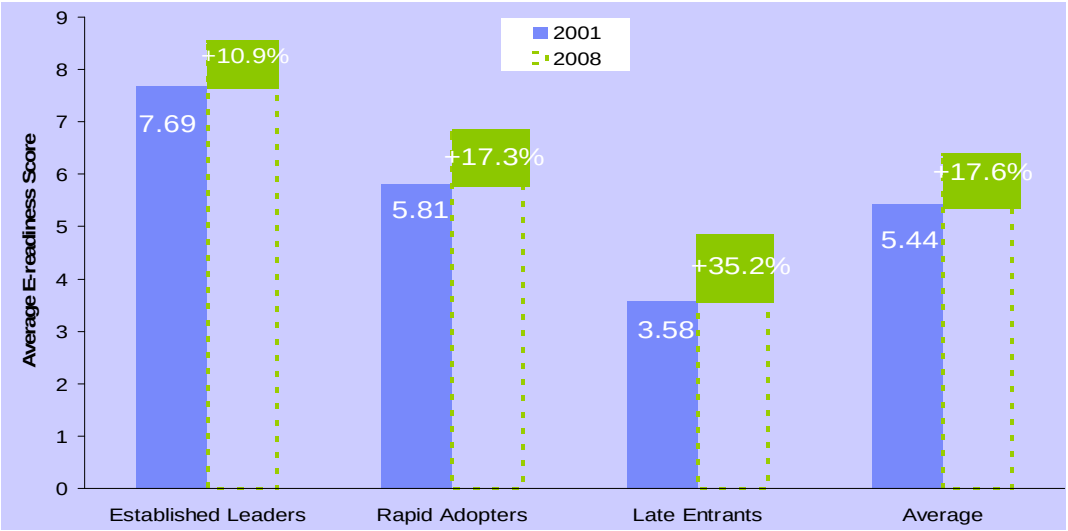
Countries in each tier and E-readiness Ranking

Established Leaders		Rapid Adopters		Late Entrants	
Rank	***Country***	***Rank***	***Country***	***Rank***	***Country***
1	US	21	Taiwan	41	Brazil
2	Denmark	22	Japan	42	Agrentina
3	Sweden	23	Italy	43	Lithuania
4	UK	24	Israel	44	Turkey
5	Netherlands	25	Malta	45	Bulgaria
6	Switzerland	26	Spain	46	Jamaica
7	Australia	27	Portugal	47	Venezuela
8	Finland	28	Estonia	48	Colombia
9	Hong Kong	29	Greece	49	Thailand
10	Norway	30	Slovenia	50	Peru
11	Singapore	31	Czech Republic	51	Saudi Arabia
12	Canada	32	Chile	52	Romania
13	Germany	33	Hungary	53	India
14	Austria	34	UAE	54	Trinidad & Tobago
15	Ireland	35	South Africa	55	Philippines
16	New Zealand	36	Malaysia	56	Russia
17	Bermuda	37	Poland	57	Egypt
18	South Korea	38	Slovakia	58	Sri Lanka
19	Belgium	39	Mexico	59	Jordan
20	France	40	Latvia	60	China
				61	Ecuador
				62	Ukraine
				63	Nigheria
				64	Indonesia
				65	Iran
				66	Vietnam
				67	Algeria
				68	Kazakhstan
				69	Pakistan
				70	Azerbaijan

Source: IBV Analysis based on EIU E-Readiness Rankings 2001-2008

Since 2001 the overall E-readiness performance of all countries has improved significantly, although the pace of development varied across the three tiers. The most extensive and mature ICT users, Established Leaders, improved their E-readiness by almost 11 percent between 2001 and 2008. Rapid Adopters improved their E-readiness by over 17% percent, thereby beginning to challenge the leaders in the pace of ICT enablement. Late Entrants – laggards in the use of ICT for national economic development – have also committed to transforming their societies, with average rates of development for this Tier exceeding those of Rapid Adopters. In short, over the past half-decade, the almost 70 countries surveyed had dramatically increased their E-readiness and thus their ability to compete on a global basis with both the necessary ICT and social/legal infrastructures. While Late Entrants have made the greatest progress, the E-readiness scores for this Tier indicate that they have experienced difficulty in embracing the practices of countries above them (see Figure 2). Countries have moved around and occupied different spots in the annual E-readiness surveys during 2001-2008. A look at the average ranking for the period highlights the true E-readiness leaders in each tier for the period.

Figure 2
Average increase in E-readiness score 2001-2008



Source: Annual E-readiness Rankings 2001-2008, Economist Intelligence Unit.

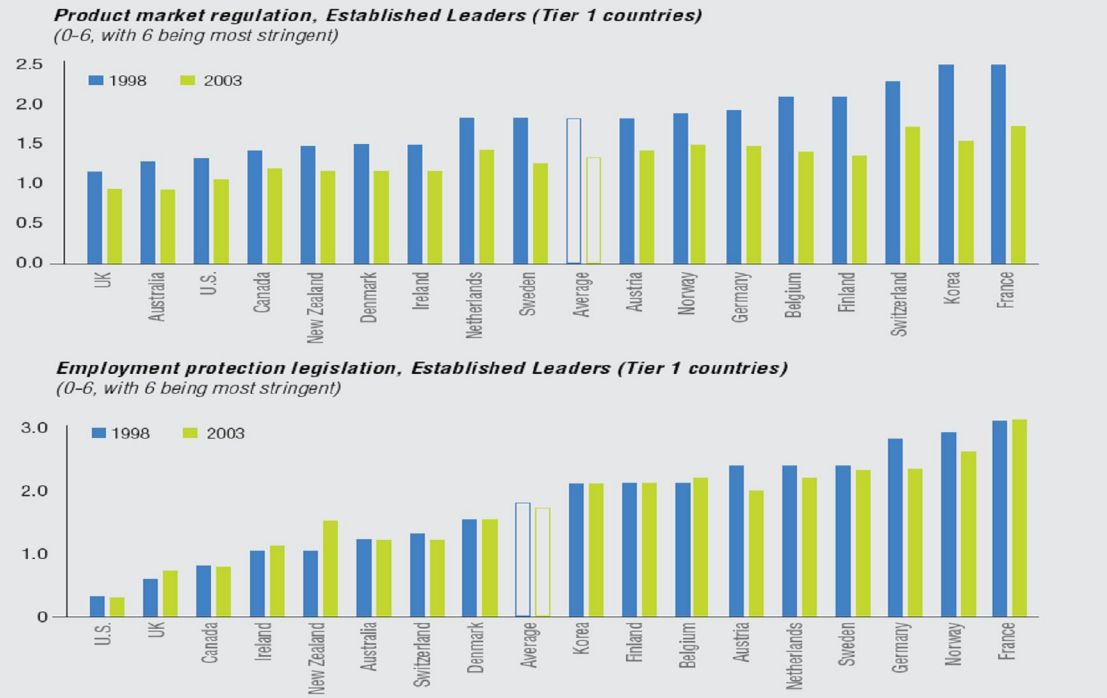
2.1 Established Leaders: Profiles and key trends

This group is made up of the top 20 countries in the rankings and it includes many nations from Western Europe, North America and Asia-Pacific. Politically, they generally have representative governments, are pro-competition, and are open to foreign investments and ownership. They also have flexible labor laws and extensively developed labor markets. Governments have advanced highly developed e-government strategies. Most became early adopters of ICT, in many instances as early as the 1950s and 1960s, which explains why numerous government agencies still have legacy systems that owe their origins to computing from these earlier decades. Economically, per capita gross domestic product (GDP) tends to be high, in the range of US$30,000 to US$50,000 for most countries. In these countries, new businesses can be registered very quickly, usually in 18 to 20 days. Businesses' expenses for complying with government regulations are the lowest of the three tiers, and few legal impediments exist for their growth inside the nation and overseas. There are also multiple funding sources available for new start-up businesses. These successes and advantages of the Established Leaders are relative to the performance of all other nations, yet even they have much room for improvement. However, as discussed below, even the most advanced countries still have much room for improvement because they must compete with each other for talent, capital and business while serving citizens who are increasingly aware of what other governments do for their people.

More than any other set of nations, Established Leaders have liberalized both product markets and labor legislation, largely in the 1980s and 1990s. These led to strong macroeconomic environments and labor markets, both prerequisites for a strong ICT environment. The United Kingdom, New Zealand, Canada, Denmark, United States, Netherlands and Ireland have done the most. Consequently, they have enjoyed some of the strongest macroeconomic conditions over time. Additionally, this collection of countries reduced significantly local barriers to entrepreneurship and competition, particularly between 1998 and 2003 – just as the Internet was becoming a global force influencing the behavior of firms around the world (see Figure 3). This facilitated more effective diffusion of ICT in their economies. Countries such as Ireland, New Zealand, and Germany reduced

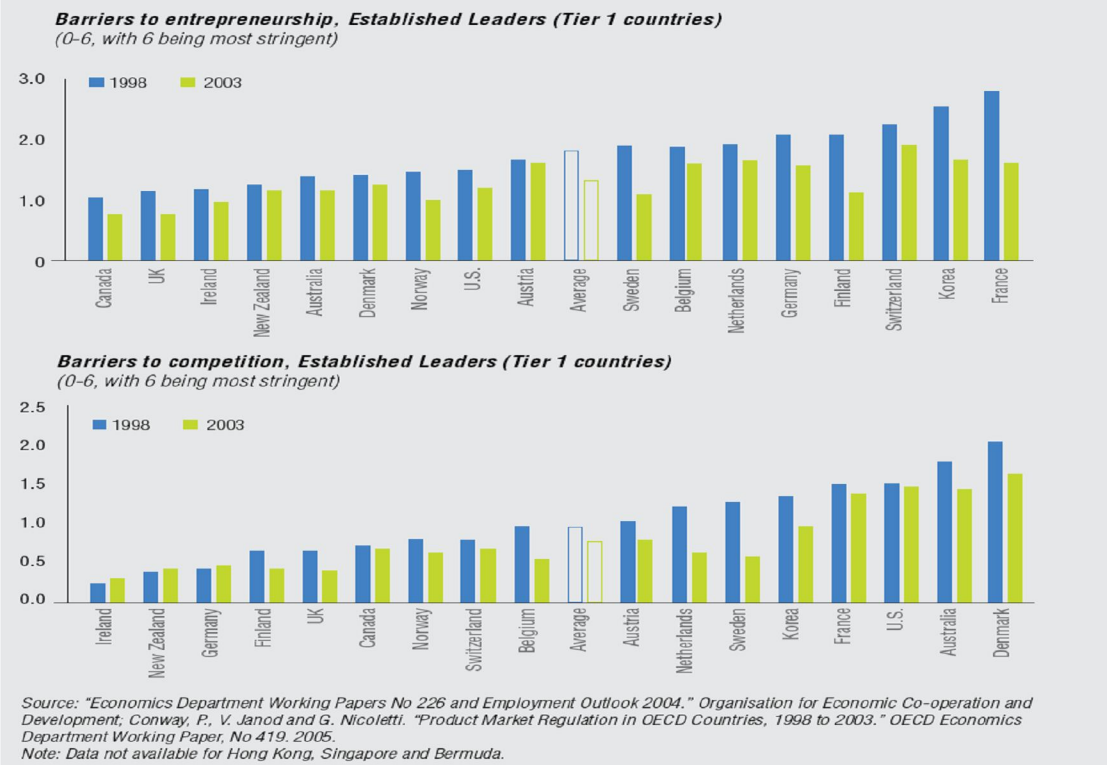
legal barriers to entry, although they still have room for improvement when compared to economic rivals (see Figure 4).

Figure 3
Product market regulation and employment protection legislation: Tier 1 Countries



Source: "Economics Department Working Papers No 226 and Employment Outlook 2004." Organisation for Economic Co-operation and Development; Conway, P., V. Janod and G. Nicoletti. "Product Market Regulation in OECD Countries, 1998 to 2003." OECD Economics Department Working Paper, No 419. 2005.
Note: Data not available for Hong Kong, Singapore and Bermuda. Employment Protection Legislation (EPL) score is an average of Temporary and Permanent Employment Contract factor scores and does not include Collective Dismissal factor score. This is done to be able to compare EPL scores across countries and years.

Figure 4
Barriers to entrepreneurship and competition: Tier 1 Countries



Source: "Economics Department Working Papers No 226 and Employment Outlook 2004." Organisation for Economic Co-operation and Development; Conway, P., V. Janod and G. Nicoletti. "Product Market Regulation in OECD Countries, 1998 to 2003." OECD Economics Department Working Paper, No 419. 2005.
Note: Data not available for Hong Kong, Singapore and Bermuda.

Austria, Netherlands and Sweden also proved aggressive in improving their competitive environments as well. Yet at the same time, Australia, United States, France and Denmark still have some of the highest remaining barriers to competition among the most advanced economies in the world. This could be explained in part by the simultaneous presence of state-controlled enterprises and legal barriers to competition in these countries.

In the area of employment protection, public officials have to balance several potentially conflicting priorities: protecting employees from harsh arbitrary work practices; encouraging job security; and enabling employers to add or reduce the number of employees. Officials in rapidly evolving economies also want to create circumstances where skills can evolve and workers can move from one industry or sector to another in response to changing needs of an economy. This creates opportunities for higher levels of employment, although there is possibly some cost of worker turnover. The question is thus how much flexibility an economy needs regarding the evolution and deployment of its workforce. The more an economy is changing, the greater its need for flexibility. Socially, Established Leaders have very low population growth combined with high life expectancy rates. On average, citizens in these countries have 10 or more years of formal education and rank in the top 20 in the United Nations' Human Development (HDI) Index [3]. However, their populations are also aging faster than any other parts of the world. This will require extensive resources to address three particular areas: pensions, medical care and providing government services to those less ambulatory than younger populations. Aging populations represent a unique differentiator from all other tiers of nations and loom as one of the most serious challenges for these economies. In a recent study of the problem, The IBM Institute for Business Value described a series of strategies national governments could implement to remediate these issues, including replacing older processes and uses of ICT with new

ones better suited to this population [4]. Naturally, the private sector in these countries also faces the same problems and opportunities [5].

The changes over time in the summary employment protection legislation (EPL) indicators suggest that there has been some convergence in the strictness of EPL among OECD countries. Most of the changes occurred in the 1990s, mostly the result of a relaxation of rules in countries where legislation was particularly strict. However, despite the convergence, the relative position of countries across the overall spectrum of EPL has not changed much since the late 1980s. The U.S., the UK and Canada continue to be the least regulated countries. Stricter employment protection remains a feature of southern European countries. Restrictions on the maximum duration of fixed term contracts or temporary work agencies (TWA) jobs have been eased in several countries. Denmark and Sweden have removed all restrictions on the types of work for which TWA employment is legal. Denmark also eliminated restrictions on the number of renewals. The maximum duration of successive contracts has been increased in Belgium, Germany, the Netherlands and other countries. These actions are improving the flexibility of the employment pools in these nations [6].

Unlike the other tiers of nations, Established Leaders face a serious economic challenge in the form of rapidly aging populations. Technologically, Internet literacy is quite high by global standards, with 50 to 60 percent of the population using this technology and 80 to 90 percent using mobile telephones. Citizens spend the most on ICT per capita, in the range of US$2000 to US$2500. They are also switching rapidly to broadband and wireless uses of ICT. There is a strong e-services market and their governments play leading roles in defining Internet laws and intellectual property management.

Measured by E-readiness scores, these countries have remained very similar for a number of years, reflecting the use of mature technologies. Many of their social, legal and political infrastructures are well advanced. These countries have taken the lead in changing their legal and policy environments relating to ICT use – most specifically, the Internet – while their business environments have remained generally stable and prosperous, supported by sound government policies. Since 2001, membership in this elite group has remained relatively constant with several others that could easily have been included here. Nations included tend to be West European (12 of 20) and Japan has come and gone (possibly only momentarily) as a member, while Korea recently ranked high enough to join this tier.

2.2 Rapid Adopters: Profile and key trends

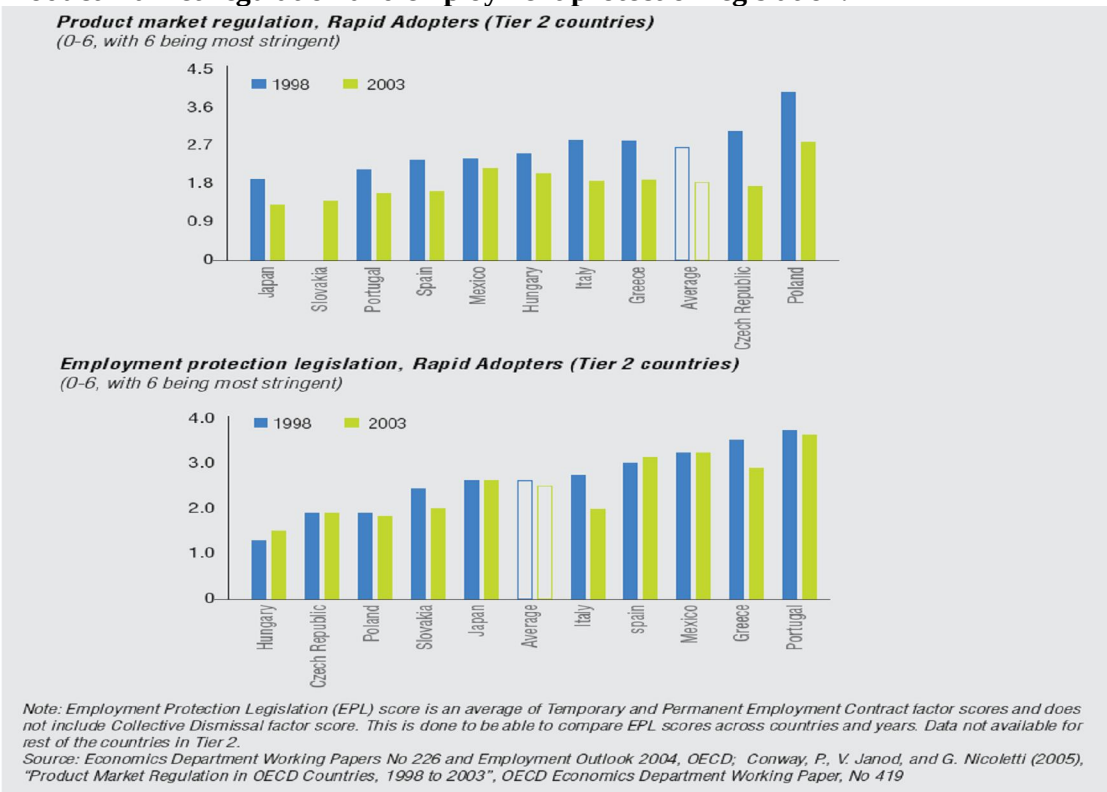
Rapid Adopters – countries which have made rapid progress in ICT development in recent years – have begun to embrace the key prerequisites for being competitive in the modern global economy. The middle tier or Rapid Adopter countries consist of two types: those who fell behind their more developed peers due to slow pace of economic reforms; and nations that otherwise would have been designated as Late Entrant economies if they had not accelerated growth through fast-paced market reforms.

The political environments of Rapid Adopters tend to support slightly higher levels of product market regulations as compared to the Established Leaders, but are being liberalized at a very fast pace across many industries. Their labor markets are reasonably developed and have been shifting recently toward more permanently flexible forms that make it easier for firms to add and change personnel, and to use temporary workers.

Governments have begun to develop Internet-based services and communications with their citizens, and are working on bringing their laws regarding the Internet and intellectual property management in line with those of leading nations. The economic environment of these countries is rapidly improving, with per capita GDP in the range of US$10,000 to US$37,000. Procedures for registering new businesses take longer as compared to Established Leaders, ranging from 30 to 35 days on average, reflecting a slightly higher degree of bureaucracy and regulatory burdens. Regulatory impediments also exist for firms that want to downsize or expand. Most of these focus largely on rules regarding hiring and dismissal of workers. In particular, this group of countries has a larger collection of regulatory barriers than the most advanced economies. Because of that, we conclude that regulatory practices serve as a drag on the economy as a whole, and most specifically on the ability of these nations to invest effectively in ICT and to diffuse its use across their societies.

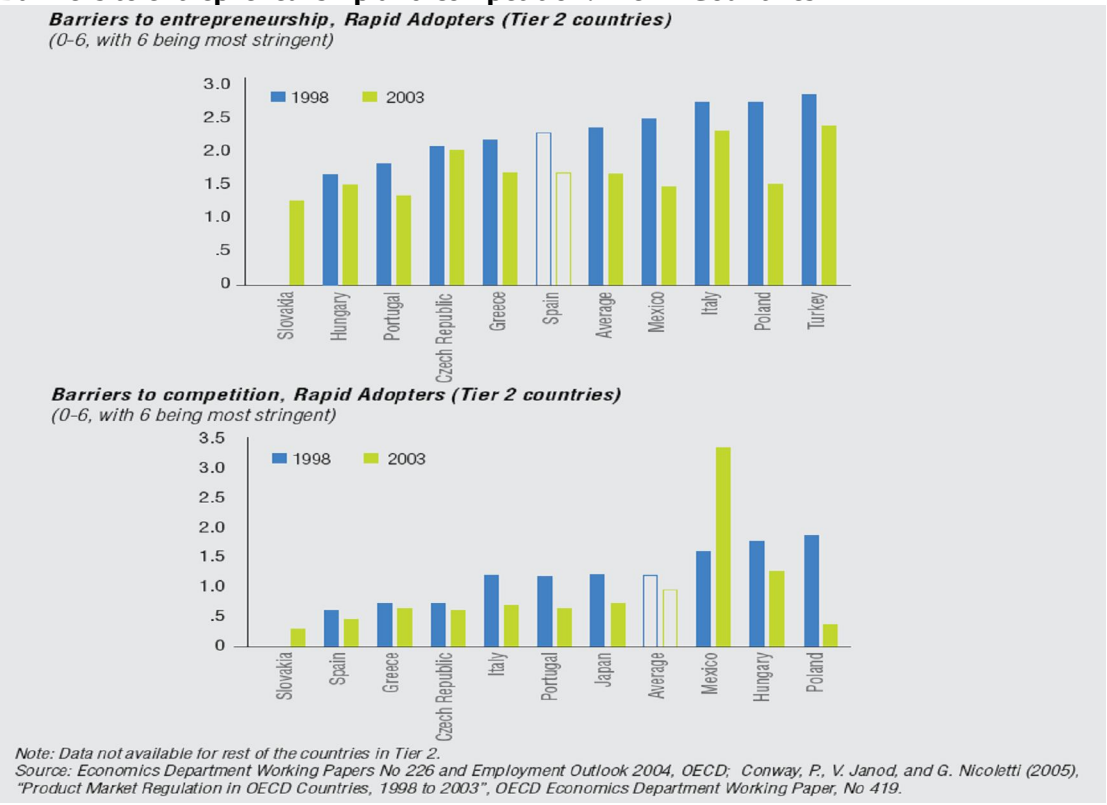
These nations – denoted as Tier 2 – have made much progress in liberalizing their economies (see Figures 5and 6). In particular, they have more work to do to transform their employment protection legislation. In addition, many countries still need to reduce barriers to entrepreneurship. Social environments in Rapid Adopter nations differ from the Established Leaders in several key ways. For the most part, they experience very low population growth rates – in some cases, the growth rate is even negative (as is the case with some Tier 1 countries). The amount of education per capita is generally lower, averaging 6 to 7 years. These nations also rank lower in the UN's HDI rankings [7]. Their technological environments reflect lower levels of Internet use, at between 15 to 20 percent of the population, yet penetration of mobile phones is high (in excess of 70 percent). Personal spending on ICT is below that of Established Leaders, in the range of US$500 to US$800 per capita, with 70 percent of it on mobile phones.

Figure 5
Product market regulation and employment protection legislation.



Note: Employment Protection Legislation (EPL) score is an average of Temporary and Permanent Employment Contract factor scores and does not include Collective Dismissal factor score. This is done to be able to compare EPL scores across countries and years. Data not available for rest of the countries in Tier 2.
Source: Economics Department Working Papers No 226 and Employment Outlook 2004, OECD; Conway, P., V. Janod, and G. Nicoletti (2005), "Product Market Regulation in OECD Countries, 1998 to 2003", OECD Economics Department Working Paper, No 419

Figure 6
Barriers to entrepreneurship and competition: Tier 2 Countries



Note: Data not available for rest of the countries in Tier 2.
Source: Economics Department Working Papers No 226 and Employment Outlook 2004, OECD; Conway, P., V. Janod, and G. Nicoletti (2005), "Product Market Regulation in OECD Countries, 1998 to 2003", OECD Economics Department Working Paper, No 419.

Yet, Rapid Adopters are experiencing sustained growth in the number of e-service firms and industries, reflecting the quickly expanding demand for ICT goods and services in most countries. Governments in these nations, however, lag their more advanced peers in adopting Internet laws and in managing intellectual property rights. Of the three groups, Rapid Adopters experienced the greatest amount of change since 2001. Today, Central and East European countries are prominent in this group as they move aggressively to modernize their economies as part of joining the European Union, and in support of national initiatives to become economically competitive in the global economy. Supporting e-services in the private and public sectors has been a major initiative.

Over the period, they improved substantively in the development of legal, policy, social and cultural environments necessary to operate an advanced economy. They generally enjoy strong economies, but lag the most advanced in the personal and business uses of ICT, despite rapid rates of adoption of computing and telecommunications (particularly mobile phones) – a process that is continuing, even though it is now decelerating in some countries as deployment becomes saturated. Our analysis of the actions of Rapid Adopter countries, when compared to those of the most aggressive users of ICT, illustrates that both are, and have been, focused on promoting connectivity of their populations to communications and the Internet. Further, they are stimulating the adoption of advanced uses of ICT by businesses and individuals, factors that seem to have the highest influence on a country's overall e-readiness.

2.3 Late Entrants: Profile and key trends

Most countries in this third tier are handicapped by poor social infrastructures reflecting such problems as low educational attainment and extensive income variation, all of which are hampering uniform ICT deployment and use across national populations. The political environment is often friendly to competition, with foreign participation allowed in certain sectors. Labor markets are less developed and there is growing recognition of the need to introduce more flexible employment contracting regulations. Most Late Entrant nations are in the early stages of developing and coordinating plans for building technology-equipped societies. Many, however, are also struggling with how to implement laws covering the Internet and have poorly managed intellectual property laws.

These countries function in weak macroeconomic environments, with per capita GDP, for example, ranging from US$3000 to US$8000 for over two thirds of these countries. Procedures for registering new businesses are very long, averaging 55 to 60 days, indicative of the slow response of government agencies in facilitating development of entrepreneurial behavior in their societies. Sources of funding and capital availability for new start-ups remain scarce for private sector use. Socially, these countries are experiencing relatively high population growth rates, with growing proportions of very young people. Average education amounts, however, at 3 to 4 years, are the lowest of all three tiers. A significant part of the Late Entrant population also lacks access to such basic living amenities as electricity and clean drinking water. Quality of health and healthcare are also quite low. Technological environments lag those of the other tiers. For example, Internet literacy exists in only 2 to 5 percent of the population and use of mobile phones has improved in recent years, penetration rates remain low relative to Rapid Adopters and Established Leaders. Not surprisingly, per capita expenditures on ICT are also low, ranging from US$100 to US$200, with 75 percent for telephone services. These nations devote more effort to developing digital telecommunications (telecom) infrastructures, which makes sense since communications is the backbone needed to support such ICT uses as broadband

Internet use or even mobile phones. E-business and e-enabled services are more the exception than the rule, although some nations are striving to develop IT outsourcing capabilities. India, as a leader in this area, is using this kind of development in support of national economic evolution.

Since 2001 Late Entrants have made significant improvements in developing more modern social, cultural, environmental and legal policies, but continue to experience low performance in such areas as encouraging consumer and business adoption of ICT, with performance scores actually dropping over time. In countries with very large populations like India and China, per capita ICT expenditures have been so inadequate that necessary infrastructures are limited. Only large and medium sized firms make noticeable use of ICT. While small enterprises may go as far as creating a Web site, little or no business is transacted online.

3. The road ahead

Each tier of countries is in various stages of transformation, some more dramatic than others. Established Leaders, with the most extensive ICT experience, need to continue innovating in their use of technology and public policies to remain competitive. The large collection of emerging rivals, Rapid Adopters, also have much work to do and are learning many useful lessons from the Established Leaders' prior experiences.

Many Late Entrant countries are displaying an appetite to modernize their economies – they are also borrowing from other nations' experiences. However, to be competitive, all nations will have to continue improving their E-readiness relative to each other. There are a number of strategies that each cluster of countries can tailor to its specific needs.

3.1 So what should Established Leaders do next?

As increasing ICT penetration ceases to be a competitive advantage, countries in the leading tier will need to raise the bar by increasing the efficiency and use of their current ICT infrastructure. Established Leader nations will want to take action on political, economic, social and technological issues as they increase their societies' ability to compete in a rapidly evolving global economy. In fact, Rapid Adopters have started to challenge the economic and social effectiveness of Established Leaders as the second tier strives to achieve the same high standards of living the first tier has enjoyed over the past two decades. Thus, while the leaders encourage Rapid Adopters to upgrade their technological, political, social and economic infrastructures – as is happening with new entrants into the European Union, the World Trade Organization (WTO) and NAFTA – global competition increases on many levels. The political environment for Established Leaders, while quite strong, calls for several sets of initiatives. Governments should consider taking the following actions:

• Reduce or maintain product and labor market regulations at low levels to facilitate sustained economic growth

• Coordinate government e-strategy through a single point of entry for all government services online, a process already underway in North America, parts of Asia and Western Europe

• Promote development of the next generation of infrastructure in the delivery of services to the nation, from further use of the Internet to open source software and widely accepted technical standards [5].
• Continue implementing market reforms that reduce the costs of new technologies to facilitate access for people who are currently excluded due to high costs.

Case Study 1: UK Online Citizen Portal

The UK has been one of the leaders in the E-readiness surveys consistently making an appearance in the top 10 slots between 2001 and 2008. There has been an unmistakable drive by the government to make the country one of the leaders in ICT adoption. Government, industry, trades unions and consumer groups came together to deliver the UK Online Citizen Portal, an initiative to provide a single point of entry to all central and local Government content online. The portal provides general information about the UK Online programs, bringing together information and advisory services from over 1000 central and local government Web sites. The design of the portal has been kept simple and accessible to meet citizens' needs, and to encourage those who may be nervous about trying new technology.

Economically, governments should focus on four essential strategies and policies:
• Increase cross-sector and cross-community linkages through exchange of leading practices and sharing of technology infrastructure among entities. This would contribute toward increasing the overall effectiveness of ICT within an economy.
• Make digital channels more convenient and more cost-effective for both governments and businesses, and to encourage higher adoption by consumers and citizens.
• Strengthen governance for e-commerce and Internet security with local industries to promote online trade.
• Gradually prepare for a declining public workforce, due to retirement, by transforming the way services are delivered and making them more IT-intensive than labor-intensive.
Socially, much good work has been done, particularly with education, but will need to be enhanced in order not to be overtaken by advancing countries that are increasingly engaging effectively in the war for talent [8]. Specifically, governments can leverage solid experience in this area, for example:
• Improve the quality of secondary and tertiary education while concentrating on reducing school drop-out rates. Also, train citizens for jobs in emerging growth areas, such as healthcare.
• Improve access to education and job opportunities to those sectors of any population currently deprived due to geographical constraints, ethnic background or physical disability.
• Reform social welfare systems to reflect the reality of aging populations, such as with incentives and other support, to allow people to work longer while facilitating easier immigration for critical professions[6].
• Integrate and continue to automate systems that exchange and share demographic data across multiple government agencies, striving for "one-stop" service to citizens, particularly for the elderly and in support of young families and children.

[5] For examples, see DiMare, Jay. "Changing the Way Industries Work: The Impacts of Service-Oriented Architecture." IBM Institute for Business Value; DiMare, Jay. "Service- Oriented Architecture: A Practical Guide to Measuring Return On That Investment." IBM Institute for Business Value. 2006.
[6] For recent examples of these kinds of activities, see Kamensky, John M. and Albert Morales (eds.). Managing for Results 2005. (Lanham, Md.: Rowman & Littlefield, 2005).

Case Study 2: Hong Kong

Exercising digital authority: Hong Kong's OG-CIO Hong Kong has, like many E-readiness leaders, empowered a single government department to oversee both its vision for a digital economy and its practical implementation. The Office of the Government-Chief Information Officer (OG-CIO) is a policy setter and IT adviser for Hong Kong's entire government, but is also an IT department in its own right. Where possible, it attempts to serve both mandates with its actions. When individual government departments acquire IT goods and services, they do so through "standing offer agreements" established by OG-CIO, whereby Hong Kong firms can apply to be pre-approved vendors; this speeds up service delivery and fosters support for the local IT industry. OG-CIO also co-ordinates efforts to create efficiency throughout its operations: it pushes all government departments to leverage outsourcing extensively in order to improve cost and operational performance of physical and software assets. Similarly, each government department needs to ensure that at least some of their citizen services are web-based, and they must add electronic channels to service delivery wherever possible. OG-CIO also tries to combine public e-adoption programmes through its own infrastructure projects: in its efforts to "unwire" its own operations, it is building over 350 WiFi access networks for each government building, which will also be made available as free public Internet access. Actions such as this have helped Hong Kong improve it's E-readiness ranking from 13th position in 2001 to 2nd in 2008.

Source: Annual E-readiness Rankings 2008, Economist Intelligence Unit

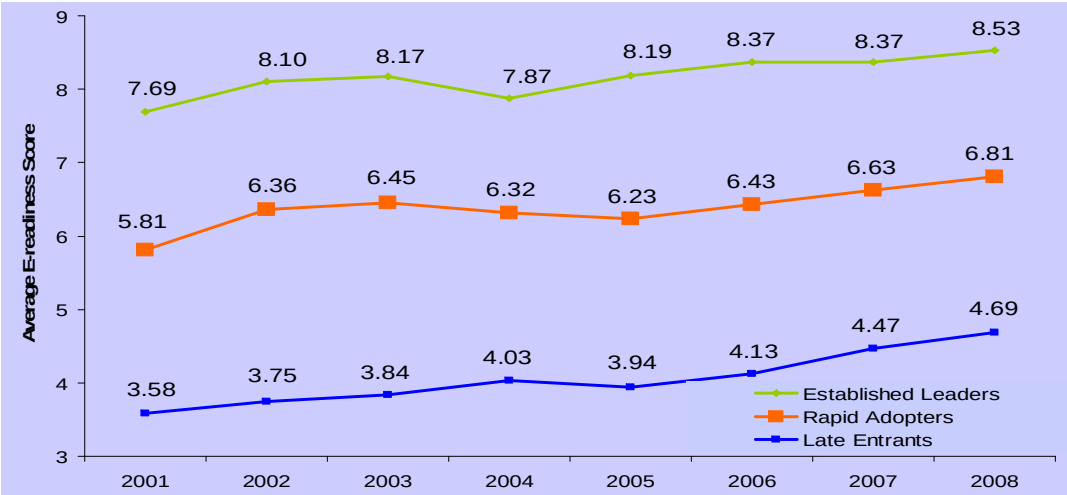
Despite enormous investments in technological infrastructure over the past half-century, it no longer is sufficient for governments to commit strongly to a vision of an Information Age society and governmental services. Established Leaders must upgrade aging ICT infrastructures to compete with the newest ones being created by the Rapid Adopters and Late Entrants that are not burdened with massive investments in older ICT. Essential improvements include:

• Develop and execute clearly articulated modern digital strategies and measure results against targets, such as the percent invested in specific types of ICT (for example, measuring broadband usage by citizens or government).

• Coordinate in a formal manner government industry programs to enable efficient rollout of new technologies and their uses.

• Develop efficient technologies for commercialization and implement transfer rules to speed their diffusion into the local society and global market. When compared to the other two clusters of nations, the evidence points to the fact that the Established Leaders, which were the earliest and most advanced users of ICT, are continuing to progress. They are extending their long standing tradition of innovating both internal governmental operations, and externally with their national economies. As Figure 7 illustrates, however, many other nations are doing that too. In short, a footrace to maintain primacy of performance is well underway.

Figure 7
Average E-readiness scores by Tiers, 2001-2008



Note: Slight decreases in 2004 and 2005 were the result of changes in criteria used in the rankings.
Source: The 2001-2008 E-readiness Rankings, Economist Intelligence Unit

3.2 So what should Rapid Adopters do next?

The challenge for Rapid Adopter countries is to reform their product and labor markets fast enough to compete against the leaders that have far more attractive business environments for new and existing firms. Second, Rapid Adopters are experiencing sharp increases in the demands of consumers and businesses to enhance existing ICT infrastructures. In many nations, these are aging or unable to handle greater volume of data, such as old dial-up telephone networks in parts of Europe not able to carry video streaming. These countries need speed of execution to make improvements within national borders and also in internal government operations. To improve their political environments, governments should consider taking steps that can speed up the transformation of their economies along lines they have already deemed desirable:

• Establish a coherent and far-reaching government "e-strategy" that provides citizens with incentives to conduct government related transactions online
• Reform market regulations to enhance local competitiveness in the global economy, not just to improve competition within the nation
• Relax labor market legislation to make temporary and permanent employment contracting more flexible
• Put public services online, such as filing tax returns, renewing car licenses and registering new businesses
• Put government's own procurement processes online as well, to make access to governmental business national and competitive.

Case Study 3: Taking ICT to the masses: Mexico

Mexico has moved around in the last eight years of the annual E-readiness rankings, but the country managed to hold onto its tier berth (40th rank overall) in the 2008. More focused government ICT policies have helped to propel Mexico's ICT environment. The government's "e-Mexico" project had already opened close to 3200 community centers with public Internet access kiosks throughout the country at the end of 2005. This was extended with further networks to bring the total to over 9200 digital community centers at the end of 2007. The Mexican government hopes that these free public Internet kiosks in rural areas will help bring government services to citizens, reducing what has been called the "digital divide" of the urban rich from the rural poor. A growing number of Internet cafés, broader access to bundled finance packages (PC plus Internet access) and aggressive prepaid Internet offerings from service providers have all served to improve connectivity.

Source: The 2001-2008 E-readiness Rankings, Economist Intelligence Unit; OECD-Canada:Technology Foresight Forum: Presentation on e-México National System Coordinarion • October 3, 2007• Ottawa, Canada

Today, much well-deserved attention is focused on economic development policies. Four fundamental strategies can enhance a government's ability to make its economy competitive on a global scale, specifically:

• Promote public/private approaches to the development and rollout of various ICT infrastructures, such as those for telecom, Internet, online services and Silicon Valley like corridors, much as Ireland did in the 1980s and 1990s [9].

• Provide more affordable and varied financing options to new start-up businesses to foster innovation in products and services brought to market

• Reduce the lead time and simplify procedures for new business registrations

• Consider nurturing emerging services sector industries, or even providing tax incentives to help firms put their businesses online.

A key focus area for Rapid Adopters concerns education, where the opportunity to link their educational systems to the needs of the local labor market is crucial to national success. Specifically, these governments are finding it essential to:

• Enhance technical training, so workers can meet emerging market demands

• Increase access to and improve the quality of all levels of general education

• Keep improving the nation's transportation and housing infrastructure to facilitate the movement of workers to where jobs are located.

• Finally, on the technology front, governments should give serious consideration to creating programs that give ICT access to citizens or enterprises in remote areas at affordable rates.

Additionally, however, officials can leverage other capabilities of their governments to promote effective ICT use, more specifically by:

• Making it easier for firms to innovate and experiment by lowering regulatory burdens, thereby stimulating faster technology diffusion and deployment.

• Improving the public's trust in online payment systems by using legislation to promote online trade. Key tactics can include using digital signatures and digital rights management – two approaches many nations still underutilize – to stimulate innovations in local trade practices.

Case Study 4: Promoting small and medium enterprises: Taiwan

Taiwan started as a Tier 1 country on the E-readiness Rankings, but was subsequently overtaken by countries which progressed at a faster pace since 2001. The country enjoys a strong ICT connectivity infrastructure and the government has continued to invest in the deployment of a national WiMAX network in the last few years. While the adoption of ICT by consumer and business remains low compared to other Asia- Pacific countries like Singapore and Hong Kong, the government has been striving to offer help.

There are approximately 1.22 million SMEs in Taiwan, accounting for over 98% of all business enterprises in the country. Taiwan's Small and Medium Enterprise Administration has been working to promote SME e-enablement, and helping SMEs to provide high-quality products and services and to strengthen their competitiveness. Recently, subsidies were offered to 20,000 small and medium-sized businesses in 200 local industries to set up Internet databases and online trading systems. With these subsidies, the government hopes to prod companies from original equipment manufacturing into global marketing and logistics. The SMEA has implemented various other activities to promote e-business adoption including completion of 10 industry-specific online database systems, with the integration of over 1,000 items of data; for each of the industries in question, at least 100 SMEs were encouraged to implement e-commerce adoption.

SMEA is also helping enterprises to strengthen their basic digital capabilities and on helping them to make effective use of information technology to secure new business opportunities. SMEA has targeted small enterprises and start-ups, particularly enterprises in traditional industries with 20 or fewer employees. So far, 16,000 enterprises have been encouraged to upgrade to broadband Internet access, and 53,000 additional enterprises have adopted e-commerce; these efforts have stimulated the creation of more than NT$1.64 billion worth of business opportunities for the information services industry.

Source: 2001-2008 E-readiness Rankings, Economist Intelligence Unit; Small and Medium Enterprise Administration, White Paper on Small and Medium Enterprises in Taiwan, 2007.

3.3 So what should Late Entrants do next?

Often, the primary challenge for this set of countries is to enhance social infrastructures and increase aggregate incomes across society. In this way, a larger portion of Late Entrant economies can leverage ICT to improve their competitiveness in the global economy. On the political front, the rankings data confirms what economists have been suggesting for some time. Governments should create legislation that promotes international trade and business-friendly economies, while eliminating corruption. Market regulations can be modified to promote competition and relax labor laws to make it easier for employers to hire temporary and permanent employees. Reducing the complexity, cost, and time for new businesses to register offers a nation an opportunity to enhance local entrepreneurship, often seen as a major driver of economic prosperity. Officials in Late Entrant nations will have much to do in improving their economy's prowess. In particular, five strategies can build nicely on the experiences of other nations:

• Develop efficient, secure logistics and transport infrastructures to facilitate quick, cost-effective movement of goods and people
• Solicit participation from industry in areas like electricity, healthcare and education
• Use innovative options like micro-financing to promote small-scale industry for self employment of low-skilled workforces

• Develop agricultural support programs for the collection and dissemination of data on farmers' activities, weather patterns and commodity prices
• Reduce significantly the lead time and complexity of registering new businesses.

Social policies are also important for the future of these nations. Improving the quality and amount of education – at the primary, secondary and tertiary levels – should be one of a Late Entrant nation's highest priorities and remain so for the foreseeable future. Educators will need to weave computer literacy into their curriculums and training programs. They should also facilitate access to distance learning. Providing personal computers in public places in small and large communities also helps literate, low-income segments of society gain access to useful information. For example, in Brazil a government-industry alliance set up Internet kiosks in shops that gave low-income Brazilians free access to online services. Similar community access programs could be delivered through access at schools or with the aid of public help groups.

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Case Study 5: India

India's telecom liberalization kicked-off in 1997 when an independent regulator, Telecom Regulatory Authority of India (TRAI) was set up, and cellular and basic services were opened to private competition. The government has since liberalized continuously the telecom market and the limit on Foreign Direct Investment in the sector has been relaxed. Legislation promoting competition in the telecom market helped reduce telecom tariffs to among the lowest in the world currently and increased "teledensity" (defined as the number of telephone lines per 100 inhabitants) to about 14 percent, up from close to 2.5 percent at the start of the century. The government also provided several incentives to the ICT industry in India, including tax holidays and 100 percent FDI in the IT sector. Several Software Technology Parks (STP) are being setupin India by the Ministry of Communication and Information Technology with the objective of encouraging, promoting and boosting the software exports from India. Companies operating in these parks enjoy excellent connectivity infrastructure and subsidies on power and other infrastructure. The IT exports from STPs in India rose 36 percent to reach US$22 billion in 2005-2006.

Source: Telecom Regulatory Authority of India (TRAI); Software Technology Parks of India (STPI). www.stpi.in/news.htm

Finally, on the technology front, lessons from early adopters of ICT suggest five clear actions Late Entrant governments can take:
• Play a larger role in creating and sustaining a national ICT infrastructure to enable improved communications and connectivity to the Internet
• Enable more affordable access to ICT by fostering competition, particularly among telecom providers
• Encourage use of ICT in the management of public finances, and in creating and disseminating social services information
• Work with businesses to develop appropriate technology standards to verify compatibility and increased seamless integration of network technologies
• Develop local ICT industries through favorable laws, tax incentives and exemptions to stimulate national GDP growth. The recent case of India should be seen as example of practical possibilities (see case Study 5).

Case Study 6: The Philippines and E-commerce mobility

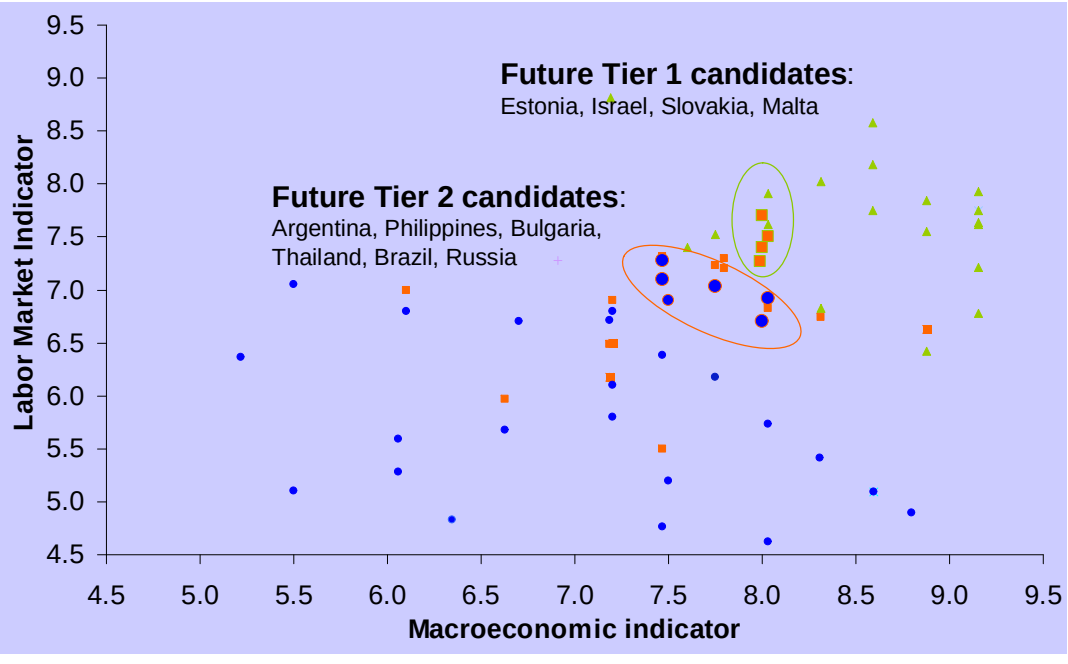
The role of mobile communications in digital commerce in many developing economies is not merely important—for some it may be vital for their future development. The Philippines is a Tier 2 country that was 54th in the 2008 E-readiness rankings and has a long and innovative relationship with mobile commerce. Now m-commerce service sites are becoming more integrated with Filipinos' broader online activity. New mobile "loading" sites (where money is transferred, usually from friends and relatives abroad, to a local mobile phone linked to a bank or debit account) such as Aryty also operate like social networking sites, offering users chat and other services. The rationale is solid: the "loading" of overseas remittances is a major source of income for relatives of the 7m Filipinos abroad—the vast majority of whom rely on online or mobile portals to manage and transfer funds. It is thus an activity that inherently relies on keeping in touch with communities of people, not simply point-to-point transfers.

Source:2008 E-readiness Rankings, Economist Intelligence Unit

What rankings of nearly seventy nations for many years suggest is that countries with the advantage of a strong macroeconomic environment and a buoyant labor market should expect to make bigger strides toward a strong E-readiness environment (see Figure 8). Rapid Adopters are the fastest progressing economies and are thus prime candidates for significant improvements, providing they continue to invest in ICT on an ongoing basis. Potential candidates to make significant improvements and possibly even join the ranks of Established Leaders include Estonia, Israel, Slovenia and Malta. This suggests that opportunities for economic growth exist all over the world and not just in one region or tier. For similar reasons, Late Entrants may evolve into Rapid Adopters. In this group, one can expect significant progress by Bulgaria, Thailand, Argentina, Philippines, and, of course, Brazil and Russia could also rise in the rankings, if they are able to enhance their macroeconomic environment.

ICT telecom spending is expected to remain the primary area of investment for Late Entrant countries. Established Leaders and Rapid Adopters, however, are pushing ahead with the development of IT-based services in order to support an increasing number of e-government and private business transactions online and in a more competitive manner.

Figure 8
Future E-readiness leaders.



Note: A higher score on Macroeconomic indicator and Labor market indicator indicates a stronger macroeconomic environment and better developed labor market. 1 is the lowest score, 10 is the highes.
Source: Annual E-Readiness Rankings, 2008, Economist Intelligence Unit

4. Conclusions - The way forward

There is no one tried and tested way to achieve E-readiness, but there are a few guiding principles that policymakers can use to evaluate the opportunities for consumers and businesses to opt in to good practices.

- It has long been true that competitive telecommunications and Internet service markets are more efficient than governments in building networks and finding affordable price points for consumers. Policymakers should allow market forces to determine the course of the digital economy. Part of a government's mandate is to ensure fair access to the resources that network operators need (spectrum and rights-of way, for example). It must resist, however, the urge to try to steer its ICT industry into technology-specific directions (as when China urged its mobile operators to adopt a domestic third-generation (3G) standard).
- Governments must at the same time ensure that investment finds its way to society's digital "have-nots"; rural and poor communities, for example, tend to be left behind if operators follow a purely market-driven course. This may mean that universal service obligations need to be enforced longer, or governments themselves may need to step in to fund development. Fully one-half of the world's population will have a mobile phone in 2008; carriers will certainly have to be more creative (and cheaper) if they wish to extend their business to the other half, but governments will also have to ensure that carriers have the right incentives to do so.
- Government need to lead by example. Investment in digital processes that help to improve their own operations serves two important functions when encouraging ICT use in the broader economy. First, particularly in poorer countries, governments should strive to be an early adopter of digital practices that other organisations and individuals can emulate. Second, they create demand for technology and digitally enabled services, both through their own direct purchases and through the creation of additional channels for procurement, tax filing and other operations. (Businesses are often compelled to invest in technology in order to access such channels.)
- Governments must champion digital development, fund their own ICT infrastructure, regulate lightly and encourage others to adopt—a complex juggling act. Yet the public sector must simultaneously be as unobtrusive as possible if digital business is truly to thrive. An easy way for governments to curb their enthusiasm for influencing the outcome of digital commerce is to remain staunchly technology-neutral; that is to say, they should avoid promoting or specifying standards, makes or models of hardware and software, in either their procurement or licensing practices.
- As the 2008 rankings show, it is precariously easy to fall back on more strategic digital objectives, and thus lose some of the ground gained in building networks and communities. The world of E-readiness is a place with ever-shifting targets, where policy and practices must be reviewed and refreshed frequently in order to meet the aspirations of the communities that governments serve.

As national economies have continued to become more integrated into one global economy – due to ever-improving transportation and communications infrastructure, and efficient financial and commercial structures – every government has committed to ICT investments of one form or another. However, our findings suggest that progress should be made simultaneously on all the four fronts: political, economic, social and technological, not just along any one dimension. So, what is an official to do to continue moving forward? We believe answering several key questions is a useful next step for officials in all nations, followed by taking action that is based on the answers.

1. To what extent is my economy easy to work in – from the perspective of a local firm, an international company or as an entrepreneur – when compared to those of other nations?
2. What reforms can I legislate and implement to make my economy competitive and leverage my national assets? For example, is it more important to improve education, transportation and telecom infrastructures, or the quality of citizens' health and the environment?
3. What improvements in our social policies would make my society a place that retains local, well-educated labor, attracts talent from other nations needed in our economy, and creates a healthy and prosperous society?
4. Recognizing that every nation is at different stages of economic and technological development, what kinds of ICT investments should our nation make?
5. How can government lead the way to model the effective use of all types of technology, not just computers and communication?
6. How can I measure my nation's progress in its overall improvements? [10]

These are a few powerful questions. Every nation will have different answers, but each also has problems to solve and changes to make. National and regional governments have a central, indeed crucial, role to play in leading their citizens and institutions through economic development. Governments truly are moving quickly today to make improvements and their economies are also transforming rapidly. In short, there is an economic step change underway around the world, creating a sense of urgency for governments to exercise strong leadership. Each group of countries has much to teach others about how to make progress: first by identifying common characteristics, then by borrowing and sharing useful strategies. In the case of ICT, rates of adoption of leading practices are increasing each year, requiring governments, leading companies and institutions to move expeditiously to keep up and excel. It is why the United Nations, the European Union, and many international corporations are among the many organizations that are tracking and participating in this global process of transformation in public administration and economic innovation.

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