

## The Next Frontier of E-Government: Local Governments May Hold the Keys to Global Competition

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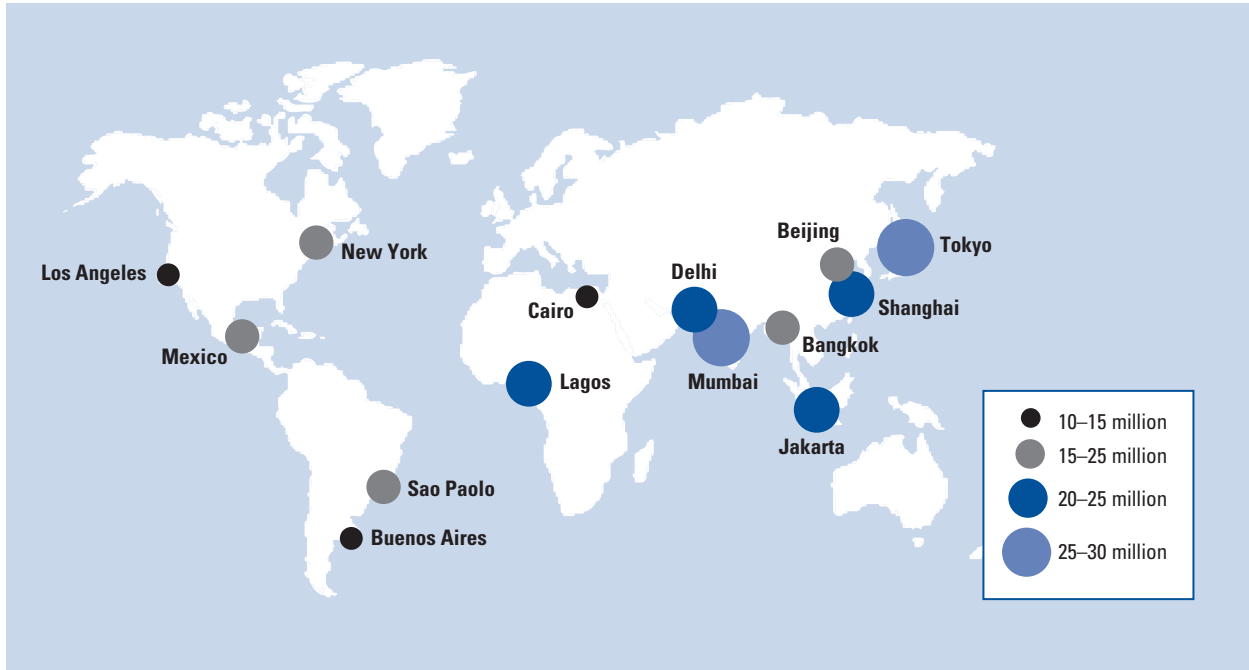
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In 1950, one-third of the world population lived in cities. Half a century later, the proportion had increased to one-half, and it is estimated that, by 2050, six billion people (that is, two-thirds of the world population) will live in cities. Currently the urban population of developing countries is projected to double in 30 years, increasing from 2 billion in 2000 to 4 billion in 2030. In less than 10 years from now, most of the “mega-cities” emerging from that process will be located in developing countries (see Figure 1).

Such projections obviously raise questions about the ability of the cities of the future to sustain this type of growth while maintaining adequate levels of production and delivery of key public services such as water, transport, electricity, sanitation, education, and containment of crime and pollution. There is, however, another side to this equation, often overlooked. It relates to the emerging role of cities (and of subnational entities generally) to become global players—as attractors of foreign investment, competitiveness hubs, and/or platforms for the combination of local and international components of global production and supply chains.

At the same time, more and more governments around the world are seizing opportunities to move to “e-government” as a way of enhancing the effectiveness and efficiency of their national public sectors, in particular through outsourcing the production and delivery of public services to the private sector. This trend compounds another one, by which central governments have been delegating an increasing number of their traditional responsibilities to subnational entities such as states, regions, municipalities, or cities. Many phrases and philosophies have been coined and formulated to describe or justify such a process, including *new federalism* in the United States, *de-centralization* and *de-concentration* in many European countries, and even *subsidiarity* in the EU context.

We are hence witnessing the rapid convergence and combination of three trends: (1) the growth of the size and economic weight of local entities such as cities; (2) the increasing ability and will of governments to use information technologies and outsourcing to fulfill their tasks and serve their citizens better through e-government; and (3) the growing potential (and obligation) of local entities (typically cities) to act as global players, designing and implementing their own policies and strategies to attract investment and carving out their share of benefits from the emerging global economy.

**Figure 1: Projected population size of mega-cities in 2015**

Source: UN Habitat and authors' calculations.

The following sections will consider the convergence of these three trends from the point of view of policymakers (local and central) by addressing the following issues:

- Do we see the emergence of “local global players” (LGPs), and, if so, what are their characteristics?
- What are the analytical tools available to measure the relative performance of local entities (typically cities) compared with the performance of nations when it comes to networked readiness and e-government?
- What do these entities allow (or not allow) us to identify as worldwide best practices in deploying e-government centrally and locally? What additional tools (indicators, data) are required to address this issue in an action-oriented fashion?

### The emergence of local global players

Both economic and urban literatures have long ago identified cities as key players in global competition, and even as central engines in shaping and spreading globalization itself. Phrases such as *global cities*,<sup>1</sup> *world cities*,<sup>2</sup> or *networked cities*<sup>3</sup> have been coined in the process.

In this context, the importance of telecommunications (and e-readiness in general) is certainly not new. Already

in 2001, Townsend noted that telecommunications networks had been “an essential component of urban infrastructure in the 1990s, enabling the coordination of increasingly complex, multilocation, and time-sensitive production systems as well as fractured social networks.”

Nowadays, a growing number of local governments are emerging as LGPs, competing for international markets and investments. Newspapers are replete with advertisements aimed at attracting companies and talented individuals to “knowledge hubs” around the world. Regularly, international magazines publish rankings of cities worldwide, according to cost of living and quality of life. Sometimes called *e-cities*, *Internet cities*, or *Knowledge Cities*, new “e-ready” hubs seem to spring up around the world.

Successful LGPs (such as Singapore, for example, or Andhra Pradesh in India) have combined superior levels of connectivity, a capable pool of human resources, and an innovative private sector. All of these can be furthered by local government policy; however, the quality and efficiency of local efforts and governance that are key determinants of the success and the competitiveness of “local global hubs” are less often noticed or quantified. Local e-government is emerging today as a powerful tool by which such LGPs have enhanced and will continue to enhance their own competitiveness and that of their respective countries (see Box 1 for definitions of *local government* and *e-government*).

In many parts of the world, building and promoting local champions of e-readiness is perceived as a national priority by central governments. In countries as diverse as Tunisia, Morocco, Senegal, Russia, the United Arab Emirates, Mexico, Qatar, or Saudi Arabia (see Box 2), major plans are being designed and launched to build local versions of IT parks, business process off-shoring (BPO) centers, and Internet/knowledge cities in an effort to capture part of the increased foreign direct investment, employment, and economic growth that a deepening of globalization is expected to bring.

It is increasingly recognized that it is not only a national government-led policy decision to support a certain industry such as ICT over others—as in the case of a localized IT park or a municipal decision to implement a city strategy for global excellence. In other words, it is not only a top-down or supply-driven approach that is causing local performance to gain in relevance. Yet relatively little attention has been given so far to analyzing on a globally

comparative basis the role of e-government services in successful LGPs.

#### How do ICT and e-government benefit local global players?

Apart from typical national e-government services such as registrations, customs, taxation, and elections, it is local governments that have direct contact with citizens for a multitude of services; these local governments also attend to a large number of citizens' needs. Specific e-government services are increasingly handled at the local rather than national level. This is the case, for instance, for small- and medium-sized enterprise (SME) registration, vehicle and drivers' licenses, enrollment at educational institutions and vocational programs, furthering human resources skills, or professional authorizations and licenses (for example, for shops, pharmacies, and so on). The provision of increasing local e-government services contributes to e-readiness and competitiveness at the global level.

More generally, developing information infrastructure and ICT services can also assist in creating relative strength

### Box 1: A few definitions

#### Local government

For the purpose of this chapter, we shall rely on the encompassing definition provided by Shah, for whom “local government refers to specific institutions or entities created by national constitutions (Brazil, Denmark, France, India, Italy, Japan, Sweden), by state constitutions (Australia, the United States), by ordinary legislation of a higher level of central government (New Zealand, the United Kingdom, most countries), by provincial or state legislation (Canada, Pakistan), or by executive order (China) to deliver a range of specified services to a relatively small geographically delineated area.”<sup>1</sup>

*Local government* can hence be considered here as comprising governments that are not central, national, or federal. The term includes state, provincial, regional, municipal, and city governments. For methodological and availability purposes, the data for this paper are cities-based; however, the lessons inform other local government structures as well.

#### E-government

*E-government*, according to the World Bank, refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government.

These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions.

Traditionally, the interaction between a citizen or business and a government agency has been taking place in a government office. With emerging information and communication technologies it is possible to locate service centers closer to the clients. Such centers may consist of an unattended kiosk in the government agency, a service kiosk located close to the client, or the use of a personal computer in the home or office.

Analogous to e-commerce, which allows businesses to transact with each other more efficiently (B2B) and brings customers closer to businesses (B2C), e-government aims to make the interaction between government and citizens (G2C), government and business enterprises (G2B), and inter-agency relationships (G2G) more friendly, convenient, transparent, and inexpensive.

It cannot be understated, however, that e-government is not mainly about informatization of government-related transactions, but foremost about better government.

<sup>1</sup> Shah 2006.

### Box 2: Building a Knowledge City in the Saudi desert

On Saturday, June 18, 2006, King Abdullah bin AbdulAziz of Saudi Arabia launched the Knowledge Economic City (KEC) in Medina, the second Holy Place of Islam after Mecca. This new city will be developed on 4.8 million square meters of land, while the constructed area will encompass 9 million square meters, attracting some 25 billion Saudi riyals (US\$6.7 billion) worth of investments. The project is expected to add 20,000 new jobs to the region.

The city will offer a range of new entities, including a technology and knowledge-based industries (KBI) zone; an advanced IT studies institute, a campus for medical research and life sciences, an integrated medical services zone, a retail zone, a business district, and a residential area. A monorail will be tethered to a planned train station, thus tapping into the railway access to Mecca, Yanbu, and the King Abdullah Economic City (to be built soon), as well as the port city of Jeddah.

As mentioned by Amr Dabbagh, governor of SAGIA (Saudi Arabia General Investment Authority, which leads the project), “This vital project falls well within plans to upgrade the Kingdom’s regions in a sustainable fashion taking into consideration each region’s

competitive advantages. Given Medina’s historic stance as the launch pad of Islamic culture more than 14 centuries ago, the KEC project is a renaissance of sorts.”<sup>1</sup>

Medina’s Knowledge Economy City will be the fourth such economic city planned for Saudi Arabia as the country looks to diversify its economy and provide employment. The three economic cities launched to date by SAGIA are in line with its strategy to promote investments into the country’s sectors that have been identified as offering the best competitive advantages—namely, energy, transportation, and knowledge-based industries. The first economic city (at an estimated cost of 100 billion Saudi Arabian riyals, launched in December 2005 in Rabegh)—the King Abdullah Economic City near Jeddah—focused on promoting energy- and transportation-related industries. The second economic city (at a cost of 30 billion riyals, also launched in June 2006 in Hayel)—the Prince Abdul Aziz bin Mousaed Economic City—is designed around transportation and logistical services. This latest city in Medina captures the essence of SAGIA’s third focus, knowledge-based industries.

<sup>1</sup> AME Info 2006.

for the local compared with the national level. ICT firms such as broadband service providers (who, unlike telecom service providers, do not necessarily face universal access obligations) can roll out services with a focus on regions or cities. The focus on the subnational may be written into a contract won through a tender issued by a local government.

Similarly, recent technological progress in “last mile connectivity” (such as WiFi and WiMAX) tends to benefit local governments directly, since they are typically concerned with a more limited geographical area (see the definition of *local government* in Box 1). Some city governments, such as those of Seattle and Philadelphia in the United States, have been quick to seize such opportunities in their efforts to provide the entire city boundaries with access to WiMAX services; these cities can reap benefits in e-readiness beyond the local level.

Clearly, such opportunities cannot be fully seized by local governments in the absence of a combination of factors, including: (1) a good and cost-effective basic information infrastructure; (2) a strong and visible political will at the local level to provide appropriate legal, regulatory,

and competition bases for good governance and a vibrant business climate; (3) adequate levels of education and “IT-savviness” in the local population; and (4) an innovative ICT private sector.

In this respect, e-government has the potential to be both an engine and a contributor to competitiveness at the local as well as at the international level. Through outsourcing contracts (private-public partnerships, or PPPs), for example, the dynamics between local government and local ICT firms can provide new markets and job opportunities for domestic firms, including SMEs as providers of local e-government services. The experience of Riga, Latvia, (see Box 3) is an interesting example in this context, and it may explain the relatively high ranking of that city in terms of e-government (discussed in the next section).

The importance of providing sufficient attention to e-readiness and e-government components in assessing the global and local performance of cities and local governments is progressively making its way in the work of analysts and practitioners.

Many of the conceptual and analytical frameworks attached to cities’ strategies identify competitiveness and

### Box 3: E-Riga: The value of PPPs

The e-Riga project is a modernization and restructuring initiative for improving the quality of municipal services and back-office support structures in Latvia's capital. It is led by the Riga City Council Information Technology Centre, which is a structural unit of the city council, dealing with the solution of all municipal issues regarding IT. In addition, a strategic partnership was established in October 2002 with Microsoft as consortium leader, together with Ernst & Young, Hewlett-Packard, Softex Latvia, and several other local companies.

Among the priorities of the project were the systematic and gradual development of information infrastructure in all of Riga, support of ICT education in schools, and support of small companies using e-commerce and ICT in innovative projects. A Web portal, supported by a data integration center, was implemented as the main gateway to Riga's City Council.

Citizens and businesses gained considerably by the introduction of easier methods of dealing with

government in a one-stop location, no longer having to visit numerous offices and fill in different forms for what should be a seamless offering. Parents wishing to register their newborn and receive baby benefits can now make the request via the Web or in person—the registration simultaneously issues a request for the benefit, and the benefit is paid directly into the parent's bank account. A significant determinant of the success of the project was the reengineering of internal processes, rendering them more citizen-centric, effective, and efficient. The case shows how the quality of local public services can be improved by redesigning processes hand-in-hand with deploying cutting-edge technology.

An additional key success factor for e-Riga was the municipality's strategic partnership with the private sector (PPP) and the adoption of information technologies that were easy to deploy and maintain.

Source: Case study in eGovernment Good Practice database, available at <http://www.egov-goodpractice.org>.

good governance as key pillars for sustainable and successful approaches and policies. Under those two headings, ICT and hence networked readiness have critical roles to play.

In the World Bank's approach, for instance, "modern communications and technology services" are quoted among the components and preconditions for cities' competitiveness, and "public access to information about local government decision making and actions" is mentioned as a tool to enhance good governance (see Table 1).

#### A tale of many cities

Although analytical efforts have been made to describe local e-government initiatives and their good practices, remarkably little attention has been granted to measuring the e-readiness of subnational spaces, including cities. Two of the more systematic attempts to measure "urban performance" or competitiveness have been made recently—one by Kaufmann et al. at the World Bank and the other by Rutgers University in collaboration with South Korea's Sungkyunkwan University in Seoul.

While the first attempt by Kaufmann et al. focuses on governance (including indicators on state capture, informal money laundering, red tape, and trust in politicians, as well as bribery in affecting utilities, laws, and permits), it also includes indicators that are vital to determining a city's level of e-readiness, such as access to electricity, telephone

lines, mobile telephones, and Internet in schools.<sup>4</sup> In contrast, the Rutgers-SKKU e-Governance Performance Index 2005 aims at ranking cities in terms of e-government performance, leaving out some indicators of e-readiness such as access to ICT and the enabling environment (see Box 4).

But why would one think that the e-readiness of an individual city can be significantly different from that of the country in which it is located? After all, looking at the way in which the Networked Readiness Index (NRI) of the present *Report* is built, one can find a significant number of key indicators that are relevant to the local level—for example, regulatory environment, intensity of local competition, firm-level technology absorption, and protection of property rights.

By comparing the overall city e-governance score of the Rutgers-SKKU dataset with the overall country networked readiness score of this GTR edition, one finds that, indeed, the e-government performance of individual cities is not straightforwardly linked to the e-readiness of the respective countries in which they are located (see Figure 2a).

In Figure 2a, the overall trend demonstrates that the majority of countries exhibit a degree of local e-government performance (the Rutgers-SKKU e-Governance Performance Index on the vertical axis) in line with what one could expect from their national networked readiness score (the

**Table 1: The World Bank's Strategic Vision & Actions to Support Sustainable Cities**

Goals	Components and preconditions	Enabling policy and institutional framework	Instruments and supporting actions
<b>COMPETITIVENESS</b>			
<ul style="list-style-type: none"> <li>• Growth and increased productivity of city output, broad-based employment, investment, and trade in response to market opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Efficient factor markets (land, labor, capital), well integrated between rural and urban economies</li> <li>• Efficient and demand-responsive markets for infrastructure</li> <li>• Efficient local public administration that is business-friendly</li> <li>• Healthy industry structures (with fluid entry and exit for firms of all sizes) that integrate informal sector firms</li> <li>• Investment and industrial development corresponding to the comparative advantage of the city economy</li> <li>• Modern communication and technology services</li> </ul>	<ul style="list-style-type: none"> <li>• Legal and regulatory frameworks that support appropriate business incentives and impose minimal transactions costs</li> <li>• Public-private partnerships to identify market opportunities and remove bottlenecks in developing land, infrastructure, and cultural heritage assets</li> <li>• Land, real estate, and transport planning that supports spatially efficient land use and adequate supply of developed land for business and residential uses</li> <li>• Rule of law and property rights protected</li> </ul>	<ul style="list-style-type: none"> <li>• National urban strategies and action plans</li> <li>• City development strategies and action plans</li> <li>• Housing and real estate development programs and housing finance reforms</li> <li>• Urban regulatory audits (land, housing, business, labor)</li> <li>• Infrastructure subsector investment and reform programs, including public-private infrastructure framework analysis</li> <li>• Macroeconomic dialogue and Structural Adjustment Lending frameworks for stabilization and economic liberalization</li> </ul>
<b>GOOD GOVERNANCE AND MANAGEMENT</b>			
<p>56</p> <ul style="list-style-type: none"> <li>• Accountability, transparency, and integrity of local government</li> <li>• Local government institutions sensitive to the needs of poor and disadvantaged residents and to gender differences in service requirements</li> <li>• Cost-effective fulfillment of local government service obligations</li> </ul>	<ul style="list-style-type: none"> <li>• Broad participation of all groups in urban governance, through both formal and informal channels and institutions</li> <li>• Clear incentives for performance by all levels of government affecting urban development</li> <li>• Strong capacity to ensure the delivery of services through a variety of mechanisms</li> <li>• Strong public trust and trust of high levels of government in local government</li> <li>• Public access to information about local government decision making and actions</li> </ul>	<ul style="list-style-type: none"> <li>• Clear frameworks for intra- and intergovernmental assignment and delegation of functions, responsibilities, revenues, and expenditures</li> <li>• Mechanisms for objective, independent review of local government performance</li> <li>• Good collaboration among local government agencies and informal institutions such as community-based organizations</li> <li>• Development and application of management tools and best practices</li> <li>• Professionalization and training of local government staff</li> <li>• Appropriate public-private partnership frameworks implemented</li> <li>• Regular public consultation and oversight in budget and local government decision making processes</li> <li>• Incentive structures for public representatives and employees that encourage integrity and minimize corruption</li> </ul>	<ul style="list-style-type: none"> <li>• National urban strategies and action plans</li> <li>• Self-standing advisory services</li> <li>• City development strategies and action plan</li> <li>• Urban management projects</li> <li>• Support to associations of municipalities for sharing best practices, technical assistance, training, and city twinning</li> <li>• Identification and dissemination of best practices in urban management</li> <li>• City awards for managerial excellence</li> <li>• Municipal management and public integrity training</li> <li>• Institutional reviews and anticorruption surveys including local government</li> </ul>

#### Box 4: Rutgers-SKKU E-Governance Performance Index 2005

The data used by this study to evaluate e-readiness at the local level are based on a survey on digital governance in large municipalities worldwide in 2005. The survey was conducted by the E-Governance Institute of Rutgers-Newark and the Global ePolicy/eGovernment Institute of Sungkyunkwan University in Seoul, Korea, and was co-sponsored by the United Nations Division for Public Administration and Development Management and the American Society for Public Administration. In this survey, *digital governance* includes both digital government (delivery of public service) and digital democracy (citizen participation in governance). Specifically, the study analyses security, usability, and content of websites; the type of online services being offered; and citizen response and participation through websites established by city governments. The instrument for evaluating city and municipal websites consisted of five equally weighed components: (1) Security and Privacy, (2) Usability, (3) Content, (4) Services, and (5) Citizen Participation. For each of the

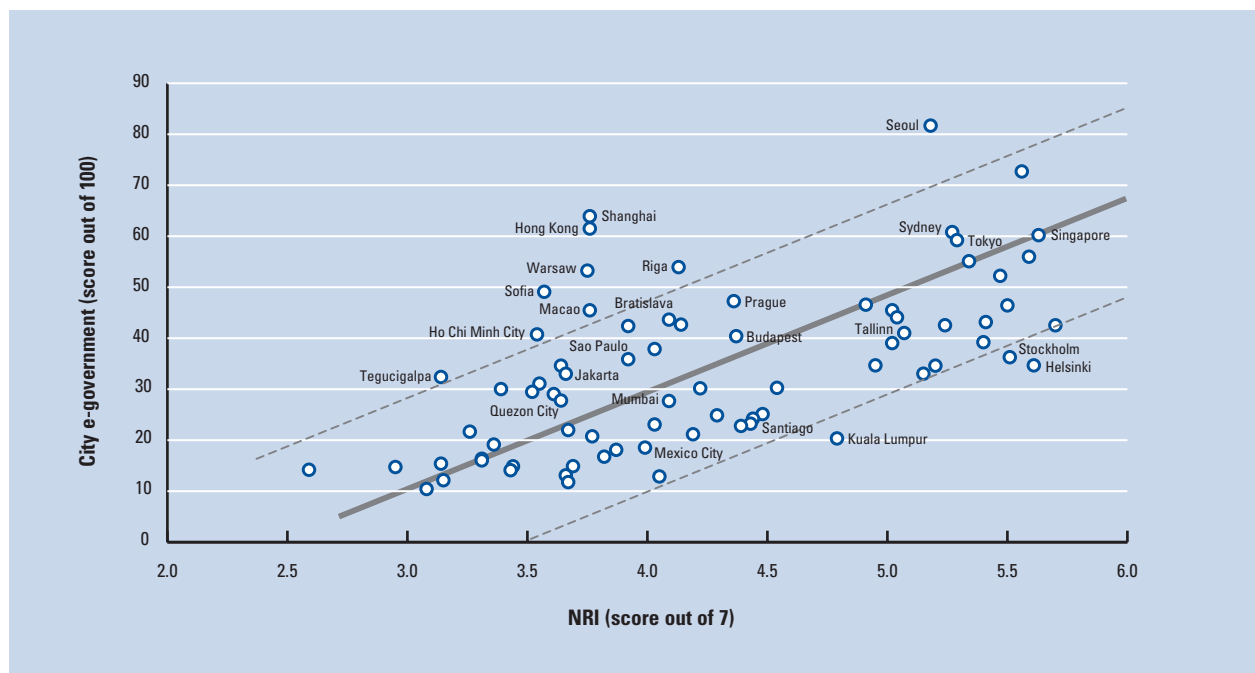
five components, 18–20 measures were applied, each coded on a scale of two to four points.

International Telecommunication Union (ITU) data were used to select the sample based on population size, the total number of individuals using the Internet (>160,000), and the percentage of people using the Internet. Websites were evaluated by two evaluators between August and November 2005 in their native languages.

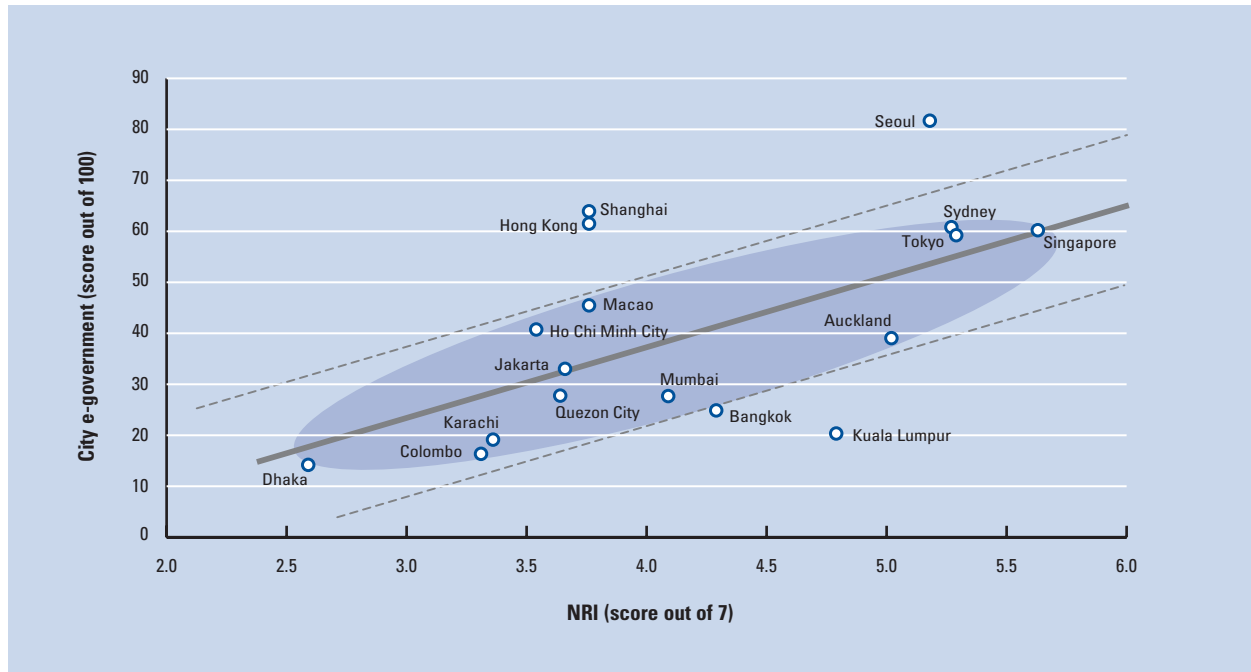
In this research, the main city homepage is defined as the official website where information about city administration and online services are provided by the city. The city website includes websites about the city council, mayor, and executive branch of the city. If there are separate homepages for agencies, departments, or the city council, evaluators examined whether these sites were linked to the menu on the main city homepage. If the website was not linked, it was excluded from evaluation.<sup>1</sup>

<sup>1</sup> More information is available in Holzer and Kim (2005).

Figure 2a: City e-government vs. overall networked readiness: World



Source: NRI 2006–07; Rutgers-SKKU e-Governance Performance Index 2005; and authors' calculations.

**Figure 2b: City e-government vs. overall networked readiness: Asia and the Pacific**

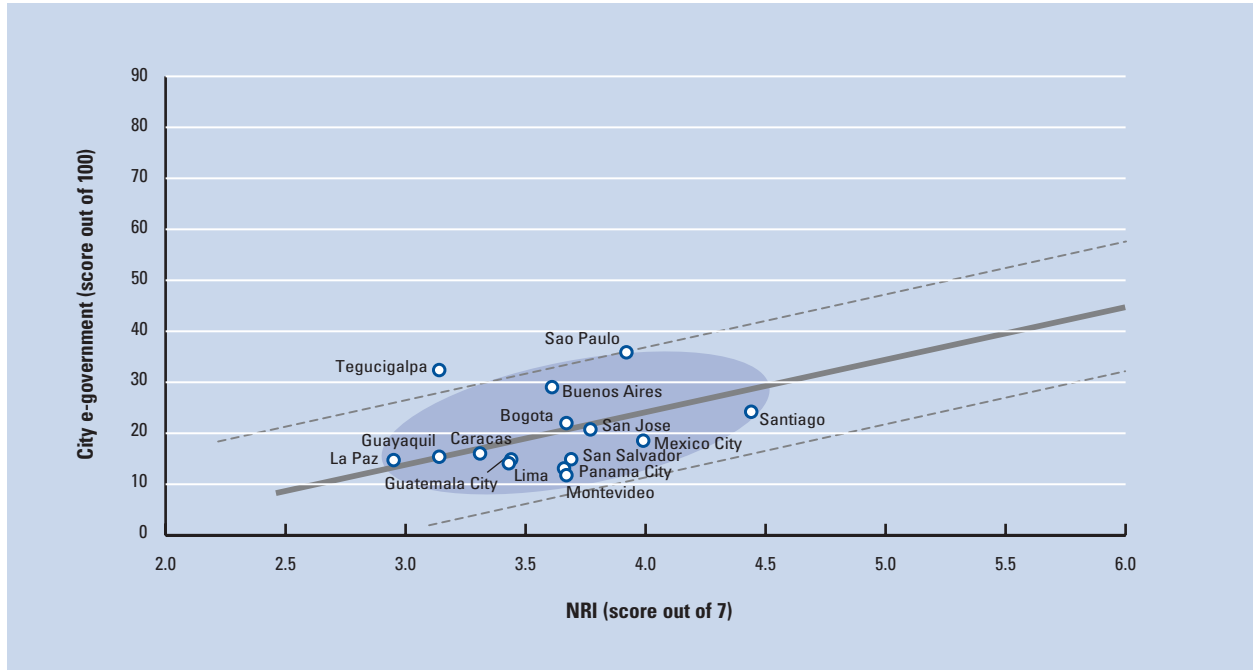
Source: NRI 2006–07; Rutgers-SKKU e-Governance Performance Index 2005; and authors' calculations.

NRI on the horizontal axis). However, several cities seem to be performing less successfully at the local level than their overall networked readiness would indicate (for example, Kuala Lumpur, Stockholm, and Helsinki). Others, on the contrary, perform better as local e-government hubs than the networked readiness of their respective countries would suggest. This is the case for Tegucigalpa (Honduras), Ho-Chi-Minh City (Vietnam), Warsaw (Poland), Macao, Hong Kong, Shanghai (China), Sofia (Bulgaria), and Riga (Latvia). In particular, three Eastern European cities in developing countries—Sofia, Warsaw, and Riga—are scoring close to or above 50 on the city axis; they are joined by three additional Eastern European cities—Tallinn, Bratislava, and Budapest—once the bar is lowered to scores or 40 or higher. Clearly there is a story to be told on city-level successes in Eastern European local e-government.

Indeed, the picture becomes more interesting and somewhat different when one considers regional subsamples of the same data. Because the overall sample—which is based on the common subset of NRI and the Rutgers-SKKU e-Governance Performance Index, making a total of 76 countries—is small, such a disaggregation cannot be pushed too far. Taking it to the level of broad regions (North America, South America and the Caribbean, Western Europe, Eastern and Central Europe, Africa, the Middle East, and Asia and the Pacific), a few interesting observations emerge.

For Asia and the Pacific, we find an ellipse that is flat (see Figure 2b), indicating a stronger correlation between overall networked readiness and municipal e-government performance. However, there are notable exceptions. Shanghai and Hong Kong as cities rank higher (Shanghai at 63.93 and Hong Kong at 61.51) than the NRI score of China as a whole (3.68) would suggest. The same is true for Seoul, the undisputed champion of the Rutgers-SKKU index with a score of 81.70; while Korea scores “only” 5.14 in this year’s NRI. The opposite story seems to affect Kuala Lumpur, which—as a city—performs less well than Malaysia as a country. At roughly the same level of overall networked readiness, the cities of Quezon City (Philippines), Jakarta (Indonesia), Ho Chi Minh City (Vietnam), and Macao, Hong Kong, and Shanghai (China)<sup>5</sup> show stark differences in local e-government performance. To some extent, the same can be said about Tokyo and Sydney, which rank closely on both measures, but when compared with similarly nationally networked Seoul, they differ with a markedly lower local e-government score.

Moving to South America, a richer set of data offers interesting insights about the relation between city and country performances. Figure 2c shows that the dispersion of South American countries along the spectrum of networked readiness is broader than that of the corresponding countries along the axis of city e-government performance—translating visually in a rather flat ellipse covering

**Figure 2c: City e-government vs. overall networked readiness: South America**

Source: NRI 2006–07; Rutgers-SKKU e-Governance Performance Index 2005; and authors' calculations.

the cloud of points. Tegucigalpa (Honduras) and Sao Paolo (Brazil) clearly outperform their respective countries, while Santiago (Chile) seems to tell the opposite story. The difference is striking between the respective city-level e-government performances of cities such as regional high-performer Sao Paolo on one hand and Mexico City on the other, although both cities operate with very similar levels of overall networked readiness.

As one could suspect, Europe offers a slightly complex picture, even if one separates Western Europe from Eastern and Central Europe (Figure 2d). A first conclusion is that the difference between “old Europe” and “new Europe” is much less visible from the point of view of cities’ performance than it is from that of overall networked readiness. At the national level, Estonia, the birthplace of Skype, remains the networked readiness champion among emerging European economies, but most of the other Eastern European economies considered also compare well with the laggards of Western Europe (for example, the Czech Republic, Hungary, Lithuania, Slovenia compare favorably with Cyprus, Greece, and Italy). However, on the city scale, Eastern Europe has a number of superior performers, including Bratislava (Slovakia), Prague (Czech Republic), Sofia (Bulgaria), and, above all, Warsaw (Poland) and Riga (Latvia), who are leaders in the European region as a whole. The e-government performance of those last three cities is clearly higher than their respective overall networked readiness levels would indicate.

**Table 2: Eastern European cities in Rutgers-SKKU subindexes**

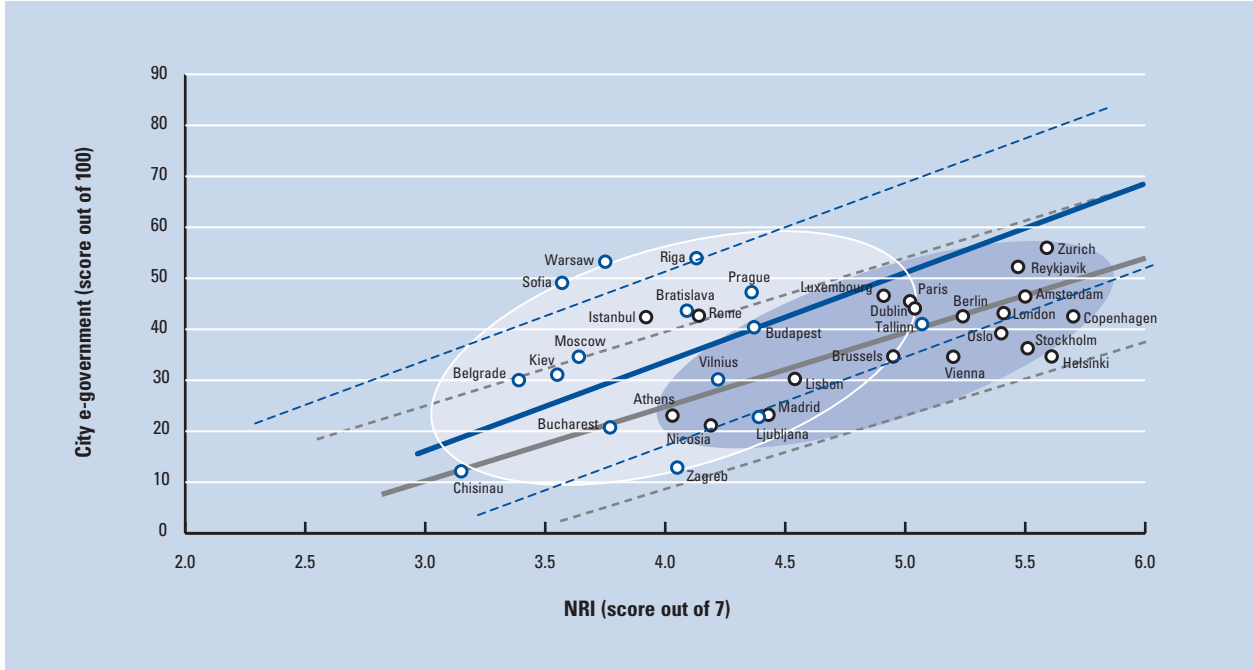
City	Privacy and security rank	Usability rank	Content rank	Service delivery rank
Prague	n/a	7	n/a	9
Riga	n/a	5	5	n/a
Tallinn	n/a	n/a	2	n/a
Warsaw	n/a	n/a	7	5

Source: Rutgers-SKKU e-Governance Performance Index 2005.

The city-level dataset offers further insight into the leadership of Warsaw, Prague, Riga and Tallinn with regard to its subindexes on usability, content, and service delivery. Notably, no Eastern European city scored well in the privacy and security subindex; however, they performed well (often being in the top 10) in the other categories (usability, content, and service delivery).

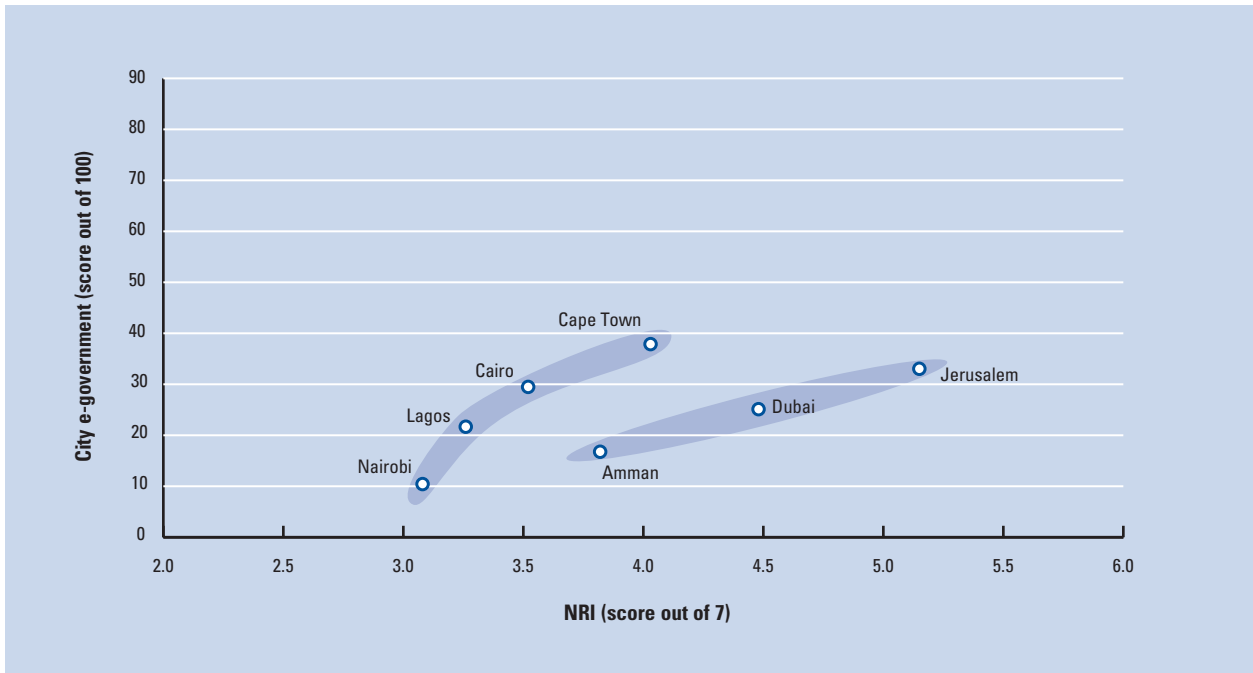
Finally, the dataset used in this study offers only a small set of cities for three regions (two cities in North America, three in the Middle East, and four in Africa—if one includes Cairo in Africa rather than in the Middle-East)—a sample that is not sufficiently large to make significant observations. One can notice, however, that in those three regions the correlation between the NRI and the Rutgers-SKKU index is strong (see Figure 2e).

Figure 2d: City e-government vs. overall networked readiness: Eastern and Western Europe



Source: NRI 2006–07; Rutgers-SKKU e-Governance Performance Index 2005; and authors' calculations.

Figure 2e: City e-government vs. overall networked readiness: Africa, Middle East, and North America



Source: NRI 2006–07; Rutgers-SKKU e-Governance Performance Index 2005; and authors' calculations.

### The next frontier: Local e-readiness

Studying local government in more detail is important given the subnational characteristics of the e-readiness agenda. The analysis above has led us to three major conclusions:

1. Subnational economic spaces (cities in particular) have played a central role in shaping the current wave of globalization. The emergence of LGPs can be seen as a revenge of geography, whereby the benefits of the “death of distance” (which have allowed international operators to invest, produce, and sell across global networks of cooperation) have been combined with those of the physical proximity or congregation of local players (for example, ICT hubs in India, or more complex combinations of talents such as in London’s City).
2. The dynamics of the ICT sector, and of ICT infrastructure and services in general, tend to reinforce the influence and roles of the local level in the overall process of globalization. The advent of short-range telecommunications technologies such as WiFi or WiMAX, combined with the regulatory space offered to broadband providers generally, are allowing the emergence of new business models that provide information-intensive services (including e-government) at the local level. In countries where most of the steps have been taken to establish e-government at the national level (as is the case in many Latin American countries, for instance), possibilities for taking advantage of new advances in IT seem to be even more significant at the local (and particularly municipal) level. For the next few years, and for all those reasons, the local level can truly be seen as the next frontier of e-government on a worldwide scale.
3. The various regions of the world tell different stories about the respective abilities of national economies and cities to enhance their respective levels of networked readiness, and to use e-government as a tool for competitiveness, good governance, and improvement of the quality of life of their citizens. However, they all show (even if at varying degrees) that the digital divide is less broad between cities than it is between countries.<sup>6</sup> This results not only from the superior agility of smaller economic spaces to seize opportunities in rapidly changing environments, but also from the fact that LGPs tend to network almost naturally with each other—the result of

common technical constraints (for example, international ports need to adopt common procedures and technical norms to accommodate certain types of vessels, or deal with multi-modal transport), or of the emergence of standard practices in the ways in which global business is being carried out across national borders. In all regions, some world cities emerge from the pack, showing higher rates of e-readiness (and e-government readiness) than their respective countries.

How should those conclusions affect the policies, strategies, and day-to-day management of decision makers in government (central and local) and in the private sector (domestic and international)? Can best practices be identified across regions to demonstrate how a city, region, or other local entity can outperform its competitors (and even its own country) in terms of e-readiness? Can such practices lend themselves to identifying a corpus of knowledge that could then be shared with other cities and subnational entities in various parts of the world? Can developing countries, in particular, benefit from such practices and knowledge to accelerate their own e-strategies by fostering the emergence on their soil of LGPs? If so, should they start building knowledge cities from scratch, using brand-new technologies and state-of-the-art approaches to urban planning and city development strategies, or should they build on the existing comparative advantages of some of their poles of competitiveness such as ports or economically specialized areas?

All of those questions are of strategic importance for central and local governments, as well as for their partners from the private sector, both domestic and international. However, to address them in a meaningful manner, one would need more than the remarkably scarce data currently available.

#### The search for meaningful indicators at the local level

Five years ago, analysts were already lamenting the absence of relevant data linking the world of telecommunications and information services with that of urban and local management and competitiveness. As Townsend (2001) put it, “The recent rapid growth of the Internet has avoided scrutiny from urban planners as little information is available from which to assess its impact on cities and regions. As a result, explanations of the relationship between telecommunications and urban growth are overly simplistic.... In general, the literature on global cities is long on speculation and short on specification when addressing the telecommunications issue.”

It is fair to note, however, that significant international efforts have recently been launched to generate more internationally comparable data describing relationships

between ICT and *national* competitiveness. This was precisely the purpose of efforts made by the World Economic Forum, initially as part of its *Global Competitiveness Report* work, and soon as the basis for the first edition of the present *Global Information Technology Report*. More recently, and as a result of increased awareness generated by the United Nations World Summit on Information Societies (WSIS), a significant number of international organizations have decided to join forces to produce better data in this domain.<sup>7</sup>

A similar effort is now needed to extend such efforts to the local level.

Several important questions hence need to be examined urgently, regarding (1) the possibility of using existing methodologies (generally developed at the national level) for the collection and analysis of data concerning local governments and local entities, and (2) the necessity of creating specific data sets (and collection methods) to better understand the ways in which e-readiness is being built at the local level.

In the context of the present *Report*, it is worth considering the following issues: does it make sense to try and bring the NRI methodology to local levels? For which variables can this be done (either because the data are available, or because they can be collected or approximated)? What additional data (specific to the local level) would need to be identified, collected, and integrated in a local e-readiness and e-government index? A first attempt has been made here (see the appendix to this chapter) to address those questions, but clearly much more work is needed to provide them with the answers they deserve.

### A proposal for action

For all players involved in or affected by globalization, identifying best strategies requires the ability to identify where major decisions will be made and by whom. The present chapter has tried to show that (1) local governments (for example, cities) will play an increasingly important role in shaping their own global competitiveness and that of their respective countries, and that (2) in so doing, they will make an increasing use of ICT, especially as a tool for e-government. In that sense, local governments may indeed hold the keys to the next wave of global competition.

If this is the case, investors and policymakers will need to better understand and measure the performance of local governments with regard to e-readiness in general, and to e-government in particular. It is hence proposed here that a definite effort be launched as early as possible to identify and provide relevant data and indicators in that area.

Existing efforts and methodologies (such as this *Report's* Networked Readiness Index) should be used to their full extent. As an indication of what might be needed in this regard, the appendix to this chapter offers a first census of which NRI data would need to be generated at

the local level. An e-readiness ranking of cities worldwide could be obtained as a result, which would be of value for private and public decision makers, either as investors looking for adequate and competitive locations or as public decision makers trying to identify best practices and to stimulate the development of their own cities and economies.

By acknowledging the fact that national indicators often hide striking differences between different geographical locations, and by providing new tools to measure and address such differences (and share best practices wherever they emerge), the international community would contribute not only by enhancing the value of its current work on competitiveness, investment climate and e-readiness, but also by casting new light on ways to make globalization a tool for development and poverty reduction.

### Notes

- 1 See Marcuse and Van Kempen (1999).
- 2 See Sassen (1995) and Knox (2002).
- 3 See Townsend (2001).
- 4 See Kaufmann et al. (2006).
- 5 It must be noted here that, for the purposes of this chapter, Hong Kong, Shanghai, and Macao have been treated in the same manner: e-governance indicators (Rutgers-SKKU data) have been mapped against the country NRI rating for China. This choice was made both for consistency reasons (treating all Chinese cities in the same fashion), but also because it befits the overall purpose of this section, which is to identify cities for which local e-governance performance is above (or below) what the NRI performance of their respective national environments would suggest.
- 6 Obviously, this statement needs to be kept within the limits of the sample selected here—that is, the sample of global cities and the countries that host them. However, one could convincingly argue that a broader sample of cities/countries would probably reinforce rather than weaken this conclusion, be it only because countries that are lagging in terms of connectivity generally tend to display a stronger digital divide between urban centers (typically the capital city) and rural areas.
- 7 A result of the World Summit on Information Societies (WSIS), a “Partnership on Measuring ICT for Development” was launched in November 2005, with the goal to “accommodate and develop further the different initiatives regarding the availability and measurement of ICT indicators at the regional and international levels” and “provide an open framework for coordinating ongoing and future activities, and for developing a coherent and structured approach to advancing the development of ICT indicators globally, and in particular in developing countries.” Current partners include the ITU, the OECD, UNCTAD, UNESCO Institute for Statistics, the UN Regional Commissions (UNECLAC, UNESCWA, UNESCAP, UNECA), the UN ICT Task Force, the World Bank, and EUROSTAT. See [http://measuring-ict.unctad.org/QuickPlace/measuring-ict/Main.nsf/h\\_Toc/281E7067B40AD764C1256EE80048DACC?OpenDocument](http://measuring-ict.unctad.org/QuickPlace/measuring-ict/Main.nsf/h_Toc/281E7067B40AD764C1256EE80048DACC?OpenDocument).

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## Appendix A: Availability of networked readiness data at the subnational level

NRI indicators	Question	Published data available at the subnational level	Ability to publish or collect data for subnational level (main cities or regions)	Kaufmann et al. data available	Rutgers-SKKU data available
<b>ENVIRONMENT COMPONENT</b>					
<b>Market environment</b>					
1.01 Venture capital availability, 2006	Entrepreneurs with innovative but risky projects can generally find venture capital in your city (1 = not true, 7 = true)	No	Yes	No	No
1.02 Financial market sophistication, 2006	The level of sophistication of financial markets in your city is (1 = lower than international norms, 7 = higher than international norms)	No	Yes	No	No
1.03 Technological readiness, 2006	Your city's level of technological readiness (1 = generally lags behind most other countries, 7 = is among the world leaders)	No	Yes	No	No
1.04 State of cluster development, 2006	Strong and deep clusters are widespread throughout the economy (1 = strongly disagree, 7 = strongly agree)	No	Yes	No	No
1.05 US utility patents, 2005	Number of utility patents (i.e., patents for invention) granted between January 1 and December 31, 2005, per million population	No	Yes	No	No
1.06 High-tech exports, 2004	High-technology exports as percentage of total exports, 2004	No	Yes	No	No
1.07 Burden of government regulation, 2006	Complying with administrative requirements (permits, regulations, reporting) issued by the government in your city is (1 = burdensome, 7 = not burdensome)	No	Yes	No	No
1.08 Extent and effect of taxation, 2006	The level of taxes in your city (1 = significantly limits the incentives to work or invest, 7 = has little impact on the incentives to work or invest)	No	Yes	No	No
1.09 Time required to start a business, 2006	Number of days required to start a business, 2006	Yes	Yes	No	No
1.10 Number of administrative procedures required to start a business, 2006	Number of administrative procedures to start a business, 2006	No	Yes	No	No
1.11 Intensity of local competition, 2006	Competition in the local market is (1 = limited in most industries and price-cutting is rare, 7 = intense in most industries as market leadership changes over time)	No	Yes	No	No
1.12 Freedom of the press, 2006	In your city, can the media publish/broadcast stories of their choosing without fear of censorship or retaliation? (1 = no, 7 = yes—whatever they want)	No	Yes	No	No
<b>Political and regulatory environment</b>					
2.01 Effectiveness of law-making bodies, 2006	How effective is your national parliament/congress as a law-making and oversight institution? (1 = very ineffective, 7 = very effective—the best in the world)	No	Yes	No	No
2.02 Laws relating to ICT, 2006	Laws relating to the use of information and communication technologies (ICT) (electronic commerce, digital signatures, consumer protection) are (1 = nonexistent, 7 = well developed and enforced)	No	Yes	No	No
2.03 Judicial independence, 2006	Is the judiciary in your city independent from political influences of members of government, citizens, or firms? (1 = no, heavily influenced, 7 = yes, entirely independent)	No	Yes	No	No

## Appendix A: Availability of networked readiness data at the subnational level (cont'd.)

NRI indicators	Question	Published data available at the subnational level	Ability to publish or collect data for subnational level (main cities or regions)	Kaufmann et al. data available	Rutgers-SKKU data available
<b>ENVIRONMENT COMPONENT (cont'd.)</b>					
<b>Political and regulatory environment (cont'd.)</b>					
2.04 Intellectual property protection, 2006	Intellectual property protection in your city is (1 = weak or nonexistent, 7 = equal to the world's most stringent)	No	Yes	No	No
2.05 Efficiency of legal framework, 2006	The legal framework in your city for private businesses to settle disputes and challenge the legality of government actions and/or regulations (1 = is inefficient and subject to manipulation, 7 = is efficient and follows a clear, neutral process)	No	Yes	No	No
2.06 Property rights, 2006	Property rights, including over financial assets, are (1 = poorly defined and not protected by law, 7 = clearly defined and well protected by law)	No	Yes	No	No
2.07 Quality of competition in the ISP sector, 2006	Is there sufficient competition among Internet service providers (ISPs) in your city to ensure high quality, infrequent interruptions, and low prices? (1 = no, 7 = yes, equal to the best in the world)	No	Yes	No	No
2.08 Number of administrative procedures to enforce a contract, 2006	Number of administrative procedures to enforce a contract, 2006	No	Yes	No	No
2.09 Time to enforce a contract, 2006	Number of days to enforce a contract, 2006	No	Yes	No	No
<b>Infrastructure environment</b>					
3.01 Telephone lines, 2005 year available	Main telephone lines per 100 inhabitants, 2005 or most recent	No	Yes	Yes (1998)	No
3.02 Secure Internet servers, 2005 recent year available	Secure Internet servers per 1 million inhabitants, 2005 or most	No	Yes	No	Proxy
3.03 Internet hosts, 2004	Internet hosts per 10,000 inhabitants, 2004	No	Yes	No	No
3.04 Electricity production, 2003	Per capita electricity production (kWh), 2003	No	Yes	Yes (1998)	No
3.05 Availability of scientists and engineers, 2006	Scientists and engineers in your city are (1 = nonexistent or rare, 7 = widely available)	No	Yes	No	No
3.06 Quality of scientific research institutions, 2006	Scientific research institutions in your city (e.g., university laboratories, government laboratories) are (1 = nonexistent, 7 = the best in their fields internationally)	No	Yes	No	No
3.07 Tertiary enrollment, 2004	Gross tertiary enrollment rate, 2004 or most recent year available	Yes	Yes	No	No
<b>READINESS COMPONENT</b>					
<b>Individual readiness</b>					
4.01 Quality of math and science education, 2006	Math and science education in your city's schools (1 = lag far behind most other countries, 7 = are among the best in the world)	No	Yes	No	No
4.02 Quality of the educational system, 2006	The educational system in your city (1 = does not meet the needs of a competitive economy, 7 = meets the needs of a competitive economy)	No	Yes	No	No

## Appendix A: Availability of networked readiness data at the subnational level (cont'd.)

NRI indicators	Question	Published data available at the subnational level	Ability to publish or collect data for subnational level (main cities or regions)	Kaufmann et al. data available	Rutgers-SKKU data available
<b>READINESS COMPONENT (cont'd.)</b>					
<b>Individual readiness (cont'd.)</b>					
4.03 Quality of public schools, 2006	The public (free) schools in your city are (1 = of poor quality, 7 = equal to the best in the world)	No	Yes	No	No
4.04 Internet access in schools, 2006	Internet access in schools is (1 = very limited, 7 = extensive —most children have frequent access)	No	Yes	Yes	No
4.05 Buyer sophistication, 2006	Buyers in your city are (1 = unsophisticated and make choices based on lowest price, 7 = knowledgeable and demanding and buy based on superior performance attributes)	No	Yes	No	No
4.06 Residential telephone connection charge, 2005	One-time residential telephone connection charge (US\$) as a percentage of GDP per capita, 2005 or most recent year available	Yes	Yes	No	No
4.07 Residential monthly telephone subscription, 2005	Residential monthly telephone subscription to the public switched network (US\$) as a percentage of monthly GDP per capita, 2005 or most recent year available	Yes	Yes	No	No
4.08 High-speed monthly broadband subscription charge, 2006	High-speed monthly broadband subscription charge (US\$) as a percentage of monthly GDP per capita, 2006	Yes	Yes	No	No
4.09 Lowest cost of broadband, 2006	Lowest sampled cost (US\$) per 100 kbits/s as a percentage of monthly income (GNI), 2006	No	Yes	No	No
4.10 Cost of mobile telephone call, 2005	Cost of 3-minute local call during peak hours (US\$) as a percentage of monthly GDP per capita, 2005 or most recent year available	Yes	Yes	No	No
<b>Business readiness</b>					
5.01 Extent of staff training, 2006	The general approach of companies in your city to human resources is (1 = to invest little in training and employee development, 7 = to invest heavily to attract, train, and retain employees)	No	Yes	No	No
5.02 Local availability of specialized research and training services, 2006	In your city, specialized research and training services are (1 = not available, 7 = available from world-class local institutions)	No	Yes	No	No
5.03 Quality of management schools, 2006	Management or business schools in your city are (1 = limited or of poor quality, 7 = among the best in the world)	No	Yes	No	No
5.04 Company spending on research and development, 2006	Companies in your city (1 = do not spend money on research and development, 7 = spend heavily on research and development relative to international peers)	No	Yes	No	No
5.05 University-industry research collaboration, 2006	In its R&D activity, business collaboration with local universities is (1 = minimal or nonexistent, 7 = intensive and ongoing)	No	Yes	No	No
5.06 Business telephone connection charge, 2005	One-time business telephone connection charge (US\$) as a percentage of GDP per capita, 2005 or most recent year available	Yes	Yes	No	No
5.07 Business monthly telephone subscription, 2005	Business monthly telephone subscription to the PSTN (US\$) as a percentage of monthly GDP per capita, 2005 or most recent year available	Yes	Yes	No	No

## Appendix A: Availability of networked readiness data at the subnational level (cont'd.)

NRI indicators	Question	Published data available at the subnational level	Ability to publish or collect data for subnational level (main cities or regions)	Kaufmann et al. data available	Rutgers-SKKU data available
<b>READINESS COMPONENT (cont'd.)</b>					
<b>Business readiness (cont'd.)</b>					
5.08 Local supplier quality, 2006	The quality of local suppliers in your city is (1 = poor, as they are inefficient and have little technological capacity, 7 = very good, as they are internationally competitive and assist in new product development)	No	Yes	No	No
5.09 Computer, communications, and other services imports, 2004	Computer, communications, and other services as percentage of total commercial services imports, 2004	No	Yes	No	No
<b>Government readiness</b>					
6.01 Government prioritization of ICT, 2006	Information and communication technologies (ICT) (computers, Internet, etc.) are an overall priority for the government (1 = strongly agree, 7 = strongly disagree)	No	Yes	No	No
6.02 Government procurement of advanced technology products, 2006	Government purchase decisions for the procurement of advanced technology products are (1 = based solely on price, 7 = based on technological performance and innovativeness)	No	Yes	No	No
6.03 Importance of ICT to government's vision of the future, 2006	The government has a clear implementation plan for utilizing ICT to improve the city's overall competitiveness (1 = strongly disagree, 7 = strongly agree)	No	Yes	No	No
6.04 E-participation index, 2005	The e-participation index assesses the quality, relevance, usefulness, and willingness of government websites for providing online information and participatory tools and services to the people, 2005	No	No	No	Proxy
6.05 E-government readiness index, 2005	The e-government readiness index assesses e-government readiness based on website assessment, telecommunications infrastructure, and human resources endowment	No	No	No	Proxy
<b>USAGE COMPONENT</b>					
<b>Individual usage</b>					
7.01 Mobile telephone subscribers, 2005	Mobile telephone subscribers per 100 inhabitants, 2005 or most recent year available	No	Yes	Yes	No
7.02 Personal computers, 2004	Personal computers per 100 inhabitants, 2004 or most recent year available	No	Yes	No	No
7.03 Broadband Internet subscribers	DSL Internet subscribers, per 100 inhabitants, 2005	No	Yes	No	No
7.04 Internet users, 2005	Internet users per 100 inhabitants, 2005 or most recent year available	No	Yes	No	No
7.05 Internet bandwidth, 2004	International Internet bandwidth (Mbps) per 10,000 inhabitants, 2004	No	Yes	No	No

## Appendix A: Availability of networked readiness data at the subnational level (cont'd.)

NRI indicators	Question	Published data available at the subnational level	Ability to publish or collect data for subnational level (main cities or regions)	Kaufmann et al. data available	Rutgers-SKKU data available
<b>USAGE COMPONENT (cont'd.)</b>					
<b>Business usage</b>					
8.01 Prevalence of foreign technology licensing, 2006	In your city, licensing of foreign technology is (1 = uncommon, 7 = a common means of acquiring new technology)	No	Yes	No	No
8.02 Firm-level technology absorption, 2006	Companies in your city are (1 = not able to absorb new technology, 7 = aggressive in absorbing new technology)	No	Yes	No	No
8.03 Capacity for innovation, 2006	Companies obtain technologies (1 = exclusively from licensing or imitating foreign companies, 7 = by conducting formal research and pioneering their own new products and processes)	No	Yes	No	No
8.04 Availability of new telephone lines, 2006	New telephone lines for your businesses are (1 = scarce and difficult to obtain, 7 = widely available and highly reliable)	No	Yes	No	No
8.05 Availability of mobile telephones, 2006	Mobile or cellular telephones for your business are (1 = not available, 7 = as accessible and affordable as in the world's most technologically advanced countries)	No	Yes	No	No
8.06 Extent of business Internet use, 2006	In your city, companies use the Internet extensively for buying/selling goods and services and for interaction with customers (1 = strongly disagree, 7 = strongly agree)	No	Yes	No	No
<b>Government usage</b>					
9.01 Government success in ICT promotion, 2006	Government programs promoting the use of ICT are (1 = not very successful, 7 = highly successful)	No	Yes	No	No
9.02 Availability of online services, 2006	In your city, online government services such as personal tax, car registrations, passport applications, business permits, and e-procurement are (1 = not available, 7 = extensively available)	No	Yes	No	Proxy
9.03 ICT use and government efficiency, 2006	In your view, ICT use by the government has improved the efficiency of government services and has facilitated interaction with business and civil society (1 = strongly disagree, 7 = strongly agree)	No	Yes	No	No
9.04 ICT pervasiveness, 2006	The presence of ICT in government offices in your city is (1 = very rare, 7 = commonplace and pervasive)	No	Yes	No	No

Note: These data were compiled based on best knowledge of availability of cross-national, comparative, subnational datasets. The term *city* has been substituted for *country* in the variable definitions