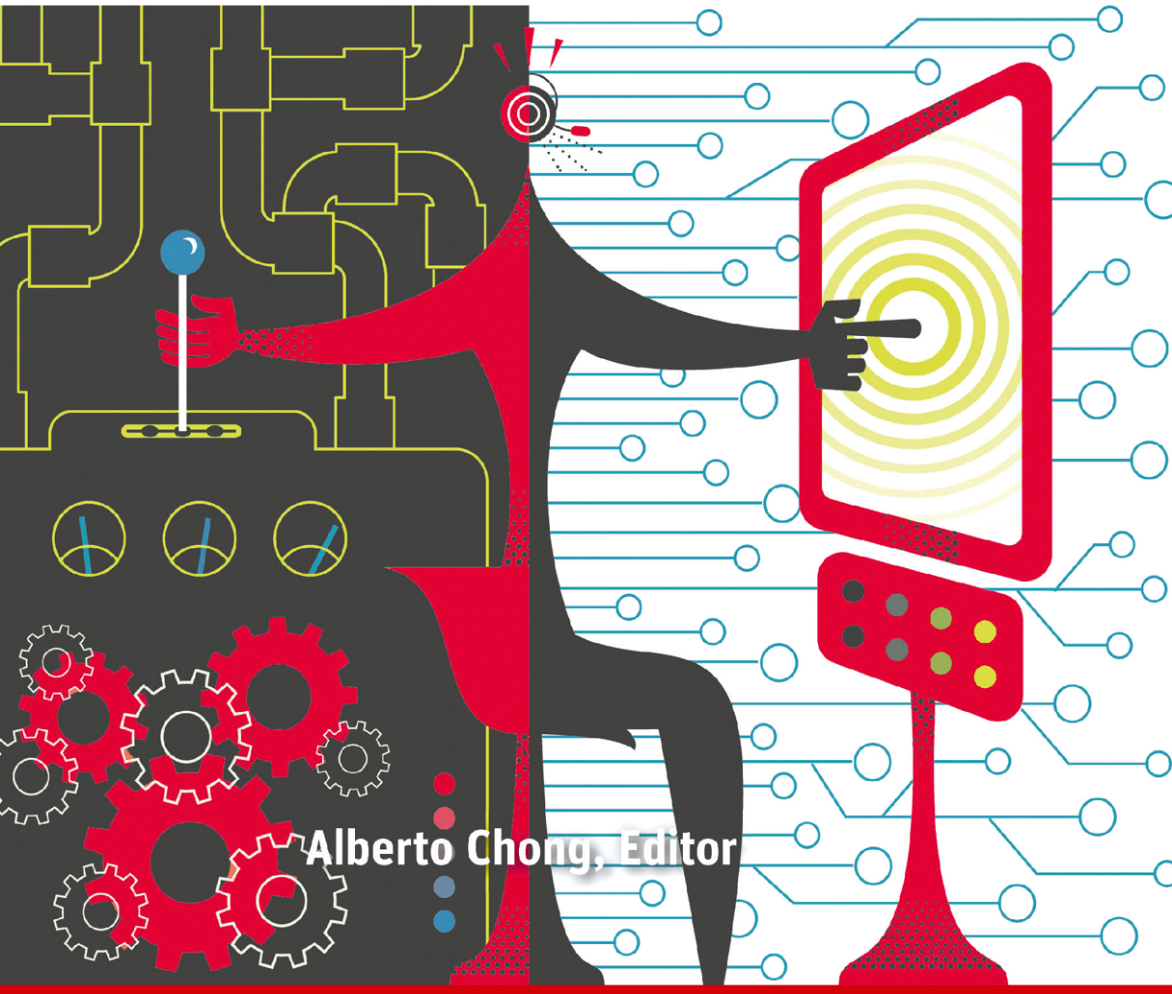
Development Connections

UNVEILING THE IMPACT OF NEW INFORMATION TECHNOLOGIES



Alberto Chong, Editor

DEVELOPMENT IN THE AMERICAS

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Inter-American Development Bank

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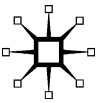

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Preface

In my frequent trips to Latin America and the Caribbean, I have been amazed to find how information and telecommunications technologies (ICTs) are touching nearly every aspect of people's lives, every day. From female peasants in rural Bolivia, to fishermen in northern Mexico, to postal workers in Barbados, to taxi drivers in urban Chile, to office workers in Nicaragua: these technologies have become indispensable for societies to function. Cell phone use in developing countries has more than doubled in less than five years, and nearly three out of four people who own cell phones live in emerging countries. The growth in the use and application of ICTs in Latin America and elsewhere has been quite remarkable, with no end in sight.

Such explosive growth has sparked great optimism among many commentators who believe that ICTs hold the key to limitless rapid growth and development in Latin America and the rest of the developing world. Although the usefulness of ICTs is undeniable, it is also true that for every action, there is a reaction. The Internet can be a source of never-ending useful information, but there are also inherent dangers to it. Better-informed rural peasants, who use cell phones to learn the prices of their products in cities, can negotiate better with middlemen. But cell phones can also be distracting. Computers provide wonderful opportunities for children, but maintaining appropriate hardware and software requires substantial resources. While the promise is clearly there, virtually no systematic or solid empirical assessments exist on the mechanisms and impact of ICTs on the welfare of people in such basic areas as education, health, institution building, finance,

and the environment. Are all these technologies equally useful? Should countries in our region prioritize some specific use or approach? What are the conditions under which ICTs can have a positive impact in Latin America and the Caribbean? How can the private and public sectors team up to optimize the impact of ICTs?

To help answer these questions, and to ascertain the impacts of ICTs for better or worse on the societies in our region, the Inter-American Development Bank dedicated this year's issue of its flagship publication, *Development in the Americas*, to study a number of specific initiatives related to ICTs. These initiatives illustrate a broad range of diverse applications in most countries of our region, and have been carried out with the collaboration of the private sector, nongovernmental agencies, and academia. The authors then painstakingly assembled detailed empirical information designed to evaluate each of these initiatives. The picture that emerges is one in which not all ICT tools are created equal. Some applications, such as finance and health-related tools, have had immediate and significant positive impact on the lives of people in our region. Others, such as those applied to environmental matters, have not had the same positive impact. The causes of this unevenness in the impact of ICTs on the welfare of the population can be traced to several reasons, but can probably be summarized by one idea: ICTs cannot do it all. ICTs are tools that help deliver solutions; they are not the solutions themselves. The promise is still there, and targeted and complementary investments can make the most of that promise. This book discusses some directions to be taken—and some to avoid.

It is with great pleasure that I present this book to policymakers, entrepreneurs, academics, and all those interested in our region. It is my hope that with the lessons provided in this volume, together

we can tap the potential of ICT and forge *Development Connections* that help propel our region's economic and social progress.

Luis Alberto Moreno
President, Inter-American
Development Bank

1

A Field of Dreams or a Dream Come True?

If You Build It, He Will Come

In the well-known novel *Shoeless Joe* (Kinsella, 1982), inspiration for the movie *Field of Dreams*, the main character, Ray, is obsessed with a voice that tells him that if he builds a baseball field in the midst of a corn field in Iowa where he lives, his hero will appear. Ray steadfastly follows the voice, and eventually the field becomes a sort of conduit to the ghosts of legendary baseball greats, who show up in his field to play ball. At some level, the expansion of information and communication technologies (ICT) is analogous to the behavior of Kinsella's main character.[1] For developing countries in particular, the implicit view has been that as long as countries adopt these technologies, their societies will be quickly rewarded in terms of both higher productivity and improved welfare.

Not without reason, the expectations assigned to these new technologies have been sky-high. ICTs have brought truly new and innovative possibilities to developing countries. To cite just a few far-flung examples: in Argentina, the citizens of La Plata can directly participate in the public projects pursued by the local government; in Peru, poor peasants in Cajamarca can use the Internet to improve health treatment; in Colombia, coffee workers in rural areas can receive and make electronic payments; in

Paraguay, the transparency of national elections can be easily monitored using cell phones and the Internet; in Mexico, firms use web-based tools to encourage people to recycle; in Bolivia, individuals receive text messages to remind them to save money; in Haiti, following the 2010 earthquake, rescuers relied on ICTs to conduct help and recovery operations. In the last twenty years, the penetration of mobile phones has expanded more quickly in developing countries than in developed ones at a rate that is nothing short of remarkable. Similarly, the per capita growth rates of users of the Internet have been higher in developing countries than in developed ones. It took about 100 years for the telephone to reach a critical mass of people around the world, and about 50 years for the television to reach that point, but it has taken only 15 years for the mobile phone and the Internet to reach a critical mass of users (Kenny, 2006). However, for all the instant access to far-flung markets, political empowerment, virtual health diagnosis, and other enhancements, it is unclear whether ICTs have been able to deliver actual economic development to Latin America and elsewhere. The available evidence has been based mostly on anecdotal cases that describe success stories but provide very little solid empirical evidence on the link between ICT and purported related gains in productivity and welfare. While evidence of this link is minimal at both the macroeconomic and microeconomic levels, it is particularly scarce in the case of the latter.[2]

The Genie in Aladdin's Lamp?

There are compelling reasons to expect significant economic development from the adoption of ICTs. The most obvious way in which these technologies can help achieve economic improvements is by improving the quantity and quality of information available: or, more precisely, in economic terms, to reduce

asymmetric and imperfect information in markets. This can help tasks related to search and coordination, which in turn may increase market efficiency. Individuals and firms can use ICTs to search for prices of products, look for jobs, find potential buyers of products, get ready for weather and natural disasters, connect with colleagues, and remain connected with friends and family (Aker and Mbiti, 2010).

Furthermore, some argue, the most recent ICTs enable a country to leapfrog development stages. They allow multiple agents to transmit and share information immediately, without the physical movement of information or individuals. Put more abstractly, ICTs enable information to be decoupled from other factors that were previously embedded together (Evans and Wurster, 1997). Unlike typical technological innovations in the past, ICT also increases the knowledge content of products and services and introduces previously unknown products, jobs, and livelihoods, among others (Torero and von Braun, 2006). As a result of these network externalities, ICTs have the ability to help create entirely new industries and, as a consequence, to create jobs that are directly and indirectly linked to these new industries. For instance, the mobile phone sector has spawned a wide variety of business and entrepreneurship opportunities, many in the informal sector. Several of these new jobs are directly linked to the mobile phone growth strategy of firms. Many mobile phone companies, for example, have partnered with formal and informal shops throughout Latin America and the Caribbean to sell prepaid phone cards in small denominations (Aker and Mbiti, 2010). Finally, ICTs play a role in the development of public policies by augmenting the range of possibilities and the manner in which policies can be implemented. For instance, policies to alleviate poverty can be much better targeted with ICT tools, producing less waste, more efficiency, and higher returns (see Chapter 8).

Similarly, policies that focus on women can be much more effective using these new technologies.

Although ICTs are promising, these technologies may not be the silver bullet that some policymakers believe them to be. First, it is difficult to provide networked services in areas where population densities are low, such as rural areas and small towns—where a considerable share of the Latin American population lives. Problems related to the cost and complexity of physical access to ICTs are not even the most significant barriers to their greater utilization (Kenny, 2006). Lack of human capital is an equal or more relevant problem. Illiteracy poses a major problem for ICT-related technologies, particularly the Internet.

Language barriers also pose a problem. A large share of the population in Latin America, and most of its poor, cannot read, much less write, in English, the language of the Internet.[3] (For many Latin Americans living in rural areas, their first language is a minority language such as Quechua or Aymara, not even Spanish, Portuguese, or French.)

Moreover, a large percentage of people in Latin America and the Caribbean eke out a subsistence living and hence are less reliant on market transactions; for them, it is doubtful that the utility of ICTs will be particularly significant. Finally, institutional barriers, such as laws and regulations, also play an important role in the development of ICT applications in the region and are difficult to adjust.

While it is crucial to keep in mind the limitations of ICT, it is equally important to understand that even within particular ICTs, not all applications and technologies are created equal. Some have proven more useful than others and have had a greater impact in the short run. Along with the "old" ICTs such as radio and television, "new" ICTs such as mobile technology have proven to be extremely valuable to societies in developing countries, regardless of the area of application.

Taking Everything into Account

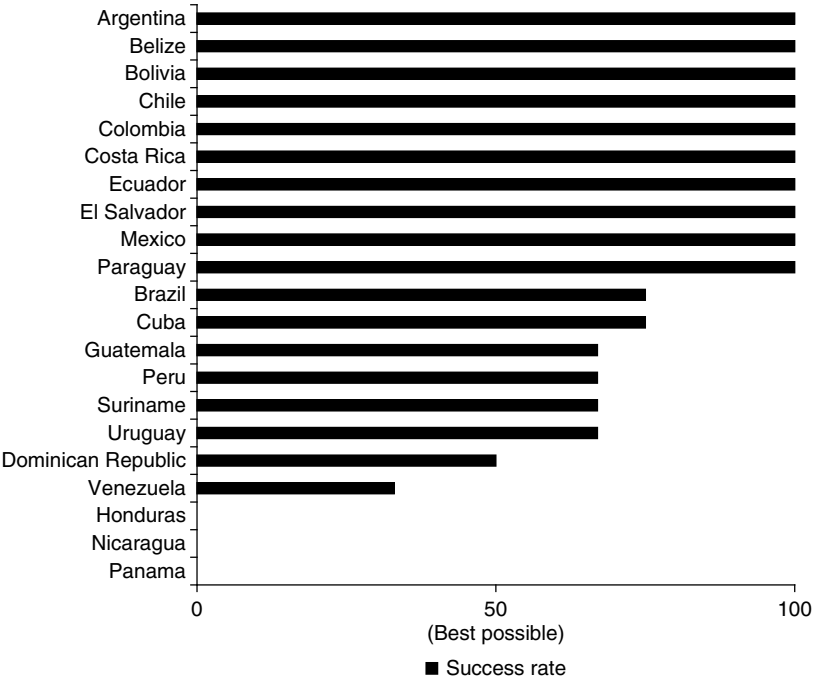
This book takes an agnostic view of the possible link between ICTs and their economic impact, as seen from the point of view of individuals, and focuses instead on applying rigorous research methods to study the issue. In evaluating the impact of ICTs—in Latin America and the Caribbean and elsewhere—a critical problem has been the lack of reliable data that may allow the specific role of a particular ICT tool to be isolated. While some advances in data collection have been made in recent years, as illustrated in chapter 2, this central issue persists for the most part. A solid understanding of what ICTs are able to achieve cannot rely on unproven success stories that sometimes end up being not so successful after all, as they are quite costly and carelessly widespread (Kenny, 2006). Indeed, projects with ICT-related components have been widely supported by multilateral organizations, bilateral aid agencies, and nongovernmental organizations (NGOs)—without rigorous evaluation of their impact.

A simple way of illustrating a proper assessment of the extraordinary potential that ICT can have in contributing to economic development is by comparing new ICT tools and applications with the world's first two-way ICT: the postal service. Chong and others (2010) carried out a simple exercise by mailing 347 letters from the United States to nonexistent addresses in 107 countries around the world and measuring how long it took for the letters to be returned to the sender, as well as the percentage of the letters that were returned within 90 days of being mailed (see figures 1.1 and 1.2). They found that the success rate of sending three letters to any particular country in Latin America and the Caribbean was highest in countries such as Argentina, Belize, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, and Paraguay, while it was lowest in countries such as Honduras, Nicaragua, and

Panama. On average, it took the postal service nearly 76 days to return the letters to the sender, ranging from 33 days in the case of Ecuador to 196 in the case of Venezuela, excluding the countries whose postal services did not return the letters to the sender. Somewhat unsurprisingly, the study found that there was a strong correlation between the level of development of the country and the efficiency of the postal service.

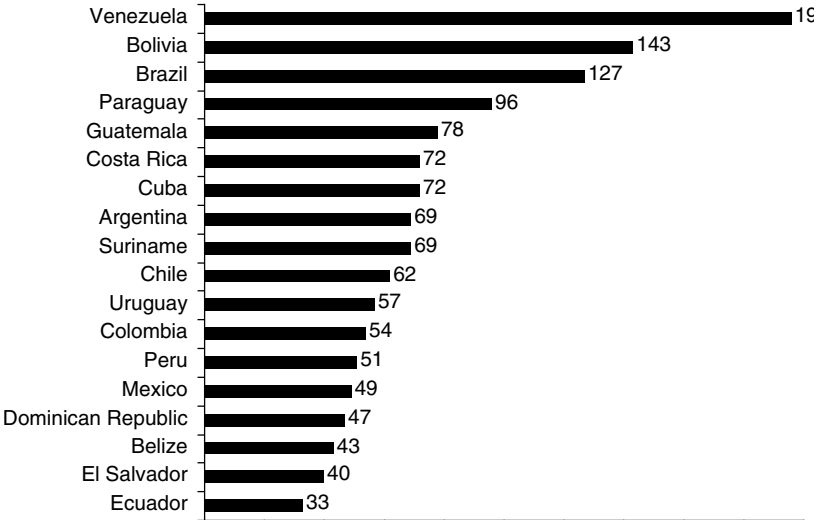
In this context, the potential of new ICT tools is clear. In the case of both mobile phones and e-mail, the equivalent success rate would be 100 percent. Similarly, the equivalent rate would be

Figure 1.1 Efficiency of the Postal Service: Percentage of Letters that Were Returned within 90 Days of Being Mailed



Source: Chong et al (2010).

Figure 1.2 The Case of Traditional ICT: Return to Sender Postal Service (in days)



Source: Chong et al (2010).

measured not in days, but in minutes. More importantly, the level of development of the country is not associated with the efficiency of the ICT tool: that is, this technology is actually leapfrogging a development stage. The case for new ICTs is seemingly straightforward. Or is it?

To better assess the potential contribution of ICTs to development, two additional factors must be considered. The first is the institutional structure that makes it possible for the technology to work. The second is the costs and benefits of employing the new technology in relation to the old one. Thus, in the case of this simple example, one would have to consider the fixed costs of installing the new technology and related networks, as well as factor in the cost of first-class international mail delivery—US$0.98