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# Development Connections: ICTs in Latin America



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The expansion of information and communication technologies (ICT) is very much a story of great expectations. 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. But is there any truth to this tale? The little research that has been done suggests that ICTs—cell phones, computers, Internet—do hold great promise, but that greater access alone cannot bring about economic development. Prior to investing in acquiring and expanding access to ICTs, governments must evaluate and strengthen their countries' capacity to use them.

Clearly, ICTs have brought new and innovative possibilities to Latin America and the Caribbean. 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

**ICTs—cell phones, computers, Internet—hold great promise but greater access alone cannot bring about economic development.**

messages to remind them to save; in Haiti following the 2010 earthquake, rescuers relied on ICT technologies to conduct search and recovery operations. In the last 20 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. To reach a critical mass of people around the world, it took about 100 years for the telephone, 50 years for the television, but only 15 years for the mobile phone and the Internet.

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 largely anecdotal and provides very little solid empirical evidence on the link between ICT and purported related gains in productivity and welfare.

There are compelling reasons to expect significant economic development from the adoption of ICTs. To begin with, these technologies help improve the quantity and quality of information available: or, more precisely, in economic terms, reduce asymmetric

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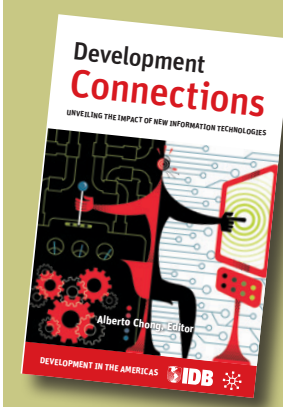
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# Development Connections: ICTs in Latin America

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and imperfect information in markets. This can facilitate 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. Some even argue that the most recent ICTs enable a country to leapfrog development stages by allowing multiple agents to transmit and share

information immediately, without the physical movement of information or individuals. 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. Thus, ICTs help create entirely new industries and, as a consequence, jobs that are directly and indirectly linked to these new industries. The best example is the mobile phone sector, which has spawned a plethora of business and

entrepreneurial opportunities, many in the informal sector.

While ICTs are very promising, they may not be the silver bullet that some policymakers believe them to be. First, it is very difficult to provide networked services in scarcely populated rural areas and small towns—where a considerable share of the Latin American population lives. Lack of human capital is an equal or even more relevant problem. Illiteracy poses a major stumbling block for ICT-related technologies, particularly the Internet, as do language barriers. A very large share of the population in Latin America, and most of its poor, cannot read, much less write, in English, the language of about 80% of the world's web sites. (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, the utility of ICTs will be minimal. 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.

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. 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. The Inter-American

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This issue of *IDEA* was prepared by Rita Funaro and was based on the latest edition of the Inter-American Development Bank's *Development in the Americas (DIA)* series titled *Development Connections: Unveiling the Impact of Information Technologies*, edited by Alberto Chong. It draws on research conducted for the book by Samuel Berlinski, Matías Busso, Alberto Chong, Julian Cristiá, Arturo Galindo, Cecilia de Mendoza, Mauricio Pinzón, and Eugenio Severín.

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# Putting Finance at Everyone's Fingertips

**A**lmost everyone in advanced economies has a bank account—90% of households to be more precise. Not so in Latin America and the Caribbean, where only 35% of households have a bank account. Undoubtedly, the region is missing out, not only on the ease that this kind of financial service represents but on the benefits that more developed financial systems provide in terms of greater financial inclusion and lower income inequality.

Expanding access to financial services to cover a larger population is very costly. Most of the activities performed by financial institutions have traditionally been carried out through

their branches. However, branching in places that are under-populated, geographically isolated or insecure can be so expensive that the cost of including new people in the business far outweighs the benefits. Here is where technology can play a crucial role. Information and communication technologies can decisively reduce the cost of expanding financial services and spread the benefits of financial inclusion, particularly among the poorest.

Several types of technological improvements are available to bring financial services within reach of households all along the income spectrum. The Internet has allowed many

households around the world to exploit the benefits of online banking, such as paying utilities or transferring money. Banking through cellular phones is also a very popular and expanding avenue in the financial world, helping diminish financial exclusion by offering services to low-income groups that have access to mobile telephones but not to financial services. ICTs can also be a very useful tool to provide information to help people make better financial decisions. For example, ICTs can help deliver financial literacy campaigns, or reminders to individuals to save more money and thus to achieve

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## Development Connections: ICTs in Latin America

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Development Bank (IDB) addressed this problem in its latest edition of its flagship *Development in the Americas* series titled *Development Connections: Unveiling the Impact of New Information Technologies*. The book relies on a large set of field experiments—actual projects that were tested in the field—in several countries in Latin America and the Caribbean. It focuses on randomized experiments: that is, experiments in which the members of treatment groups and control groups are randomly assigned to those groups. Evaluating 46 development projects in six different areas—finance, health, education, labor, institutions, and the environment—it finds that only 39% of the projects in the sample benefitted strongly from the adoption of new technologies while the remaining 61% benefitted only partially or minimally from employing ICTs.

**TABLE 1: Randomized Controlled Trials and Sectoral Impact (percent)**

	Strong ICT Link	Partial ICT Link	Minimal Link
Education	14	57	29
Institutions	50	38	13
Health	38	38	25
Finance	60	40	—
Environment	17	33	50
Labor and Poverty	57	29	14
Overall	39	39	22

Source: Chapter 1, *Development Connections*.

This edition of *IDEA* takes a look at some of the findings of these experiments as well as the policy implications derived from this research. Certainly, Latin America and the Caribbean must seek to reduce the digital divide that separates most of the region from the developed world. However, armed with

more data on what works and doesn't work in the regional context, policymakers, development practitioners and private investors can see how to best tap the potential of ICTs and forge *Development Connections* that further advance the societies and economies of Latin America and the Caribbean.

# Putting Finance at Everyone's Fingertips

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their savings goals. Beyond national boundaries, ICTs allow relatives living abroad to remit money home in a faster and cheaper way, improving the well-being of recipient households.

Perhaps the most cost-effective public policy with great potential to include the traditionally unbanked is the payment of cash transfers through bank accounts. Several Latin American countries, notably Argentina, Brazil, Colombia, Mexico, and Peru have large cash transfer programs that use their financial systems to make payments. Governments can deposit payments in beneficiaries' accounts, and beneficiaries can draw on these funds using either debit cards issued by their banks or mobile devices. Using electronic payments cuts transaction costs for beneficiaries, including the time spent in lines to receive payments, the time to convert payments into cash, the risk of having cash on hand that either can be stolen or spent, or the risk of dealing with corrupt officials who demand bribes for giving out subsidies.

A study of the *Plan Jefes y Jefas de Hogar* program in Argentina provided evidence of these benefits. This cash transfer program provides the equivalent of about \$50 a month to nearly 1.5 million people. In 2004–5, the program switched from cash payments to payments in ATMs through a debit card from Banco Nación. Recipients can use the debit card to either withdraw money from an ATM or make transactions in any store with a point-of-service (POS) device, with the added bonus of a 15-point exemption from the 21 percent value-added tax (VAT) prevailing in Argentina. The study showed that over 90% of the people sampled preferred to be paid through the debit card mechanism than with direct cash payments—not

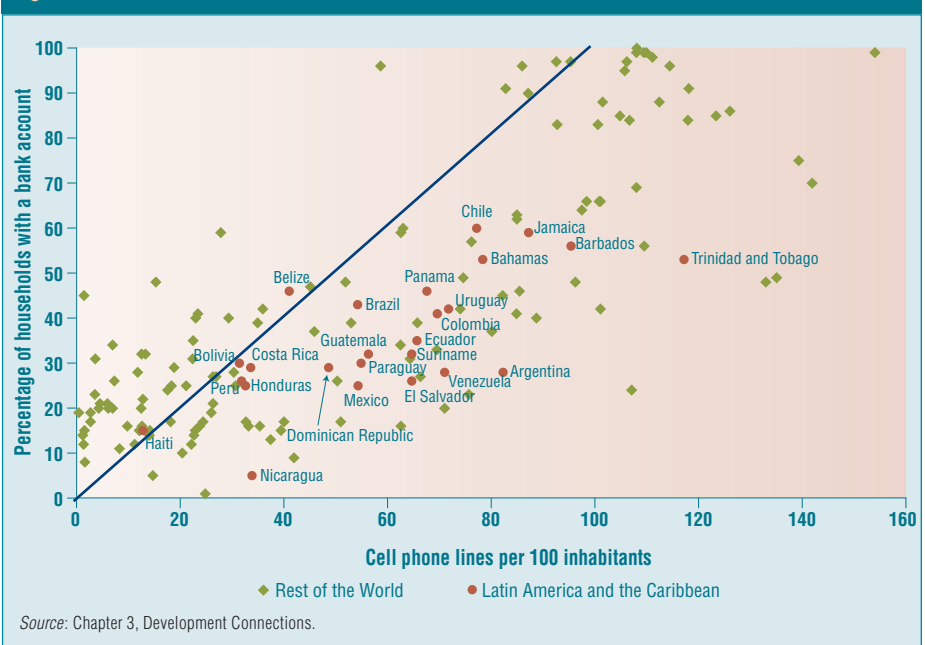
surprising since, on average, it takes more than four hours to receive the cash payment, but only 40 minutes to find an ATM and withdraw money. The time saved is used to work more, mostly in every household member's main job, and thus increase the household's income. This payment mechanism also significantly reduced the number of kickbacks and boosted purchases in formal-sector stores where debit cards are accepted.

In spite of the enormous benefits associated with these new financial technologies, up to now, Latin America and the Caribbean have lagged well behind the rest of the developing world. The poorest households in Latin America are still a long way from being able to afford a computer and Internet service of their own. In most areas, cellular phones may be the preferred technology. Worldwide, people have more cell phones

than bank accounts, and as Figure 1 demonstrates, Latin America and the Caribbean are no exception.

In terms of regulation, even though nothing explicitly forbids the provision of these new types of financial services, there are regulatory barriers that affect the way mobile banking services are provided. One of the major issues associated with potential partners is the difficulty in defining a sustainable business model around small payments, uncertainties related to countries' regulatory frameworks, and the need for sufficiently reliable nonbank correspondents. Nonetheless, many pilot projects have taken off in the region with an eye on achieving what Asian and African countries accomplished some years ago in terms of electronic financial transactions. Lucky for Latin America and the Caribbean, they have the advantage of being able to take stock of the lessons learned.

Figure 1. Access to Financial Services and Access to Cell Phones





# A Lesson on Computers in Schools

Latin American and Caribbean countries fare poorly in terms of student learning. Although enrollment has soared in recent decades, standardized test scores reveal a severely underperforming region. To improve the quality of learning, many countries in the region are vigorously pushing programs to increase students' access to computers in schools as well as at home. But can computers help close the learning gap in Latin American and Caribbean primary and secondary schools? Recent research raises some important red flags for policymakers to consider.

In the last 20 years, Latin American countries have invested heavily in ICT projects to provide students with computers and Internet connectivity. Almost all of 10 countries in a sample have followed a similar sequence of investments. Setting up computer labs has typically been the first step. Between 1996 and 2005, countries started to introduce the Internet to schools, and roughly at the same time, launched large-scale teacher training programs. Web portals have come next, as governments have tried to provide content and educational tools to schools now connected to the Internet. Finally, in the last few years, almost all countries have implemented pilot projects to distribute a computer to each student in a school.

The last few years has also witnessed a flurry of high-quality research on the impacts of ICT in education. Yet significant uncertainties still surround these interventions, especially in the case of very visible initiatives, such as one laptop per child. ICT in education can be very costly and may crowd out important alternative programs with significant returns. Since their high initial costs makes them dif-

ficult to reverse, their impact is largely unknown, and their complexity makes them difficult for governments to manage, it seems reasonable to proceed gradually with initiatives. Taking baby steps rather than leaps and bounds, planners learn from experience, evaluate the impacts generated, and adapt programs and decisions based on new information.

Studies show that increasing access to computers in schools by itself has low returns, at best. For instance, an experimental approach to evaluate a program that deployed computers to primary and secondary schools in Colombia found no impacts in mathematics and language. Following substantial changes in ICT access in Peru from 2001 to 2006, a study to explore whether penetration of computers helped reduce repetition rates also found no impacts. Similarly, two sets of Peruvian public secondary schools with different levels of computer access but other similar characteristics found no differences in math and language learning levels that could be attributable to the differential access to technology. In other words, access alone does not do the trick. Assuring how they are used is the key. Complementary inputs are critical, including the proper hardware, software, electricity, teacher training, and technical and pedagogical support. However, over and over, countries tend to put all their eggs in one single basket by simply providing computers. Budgeting for all the complementary inputs needed would minimize the waste of resources—and, crucially, provide a golden opportunity to improve the quality of education.

Certain uses of ICT can yield large positive results. Hence, it seems reasonable for governments to channel

**Studies show that increasing access to computers in schools by itself has low returns, at best.**

limited computer access to these more promising uses. In particular, providing one or two hours a week of ICT training to students seems optimal, given the evidence regarding the large impacts of this training on ICT skills and the wage premium that workers with these skills may eventually receive in the labor market.

Also, computer-assisted instruction (CAI) has shown to have significant potential to accelerate learning in math—a remarkable outcome, given the very low level of achievement in this area within the region. This was the case in the “Más Tecnología” program implemented by the municipality of Guayaquil, Ecuador in 2005 in its public schools. The program provides computer infrastructure, Internet access, training, and CAI software. The software is the critical component in the program. It was designed as a learning platform for math and language, and tailors the content based on an initial evaluation of each student. An experimental evaluation of the program suggests that it was quite effective in improving test performance in math, but did little to improve language. Importantly, students in the program were expected to devote three hours a week to using the software. Thus, part of the gains may simply reflect the greater total time

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# Beefing Up Quality for the International Market

To improve market access, food products must meet escalating safety and quality requirements around the world. To help Argentine cattle ranchers meet these market demands and improve their competitiveness in the international meat market, a project backed by the Inter-American Development Bank (IDB) and the Multilateral Investment Fund (MIF) turned to technology, developing a new system for tracing Argentine beef.

The system, called TRAZAR (from the English word, “traceability”), is a very successful example of the application of ICT methods in rural areas to increase the efficiency and potential of small- and medium-scale farmers. This program used ICT to track the production cycle of cow herds in Santa Fe province, Argentina, between 2004 and 2006. TRAZAR is a software program that stores all the information related to the identified animals and can be accessed and managed through the Internet. Traceability involves tracing each animal from the time it joins the herd until the meat is distributed, and is a requirement to export meat to high-value markets, such as the European Union (EU).

Originally, the main objective of the program was to equip small- and medium-scale cattle farmers with this tool so they could export the best quality Argentine beef. The field work started with workshops in Santa Fe to make cattle farmers aware of the advantages of the system. More than 100 cattle farmers attended, but only 40 enrolled. These 40 initial beneficiaries created a cooperative called

Progan to commercialize their products. The farmers as a group had more market power, better possibilities of reaching high-value markets, greater social capital, and better knowledge of the business. Before the program was launched, many of these same farmers sold their cows and calves to the nearest meat processing company for cold storage. Once they started using the TRAZAR software and participating in Progan, they became involved in all the links of the beef production chain: primary production of animals, commercialization, industrialization, and distribution.

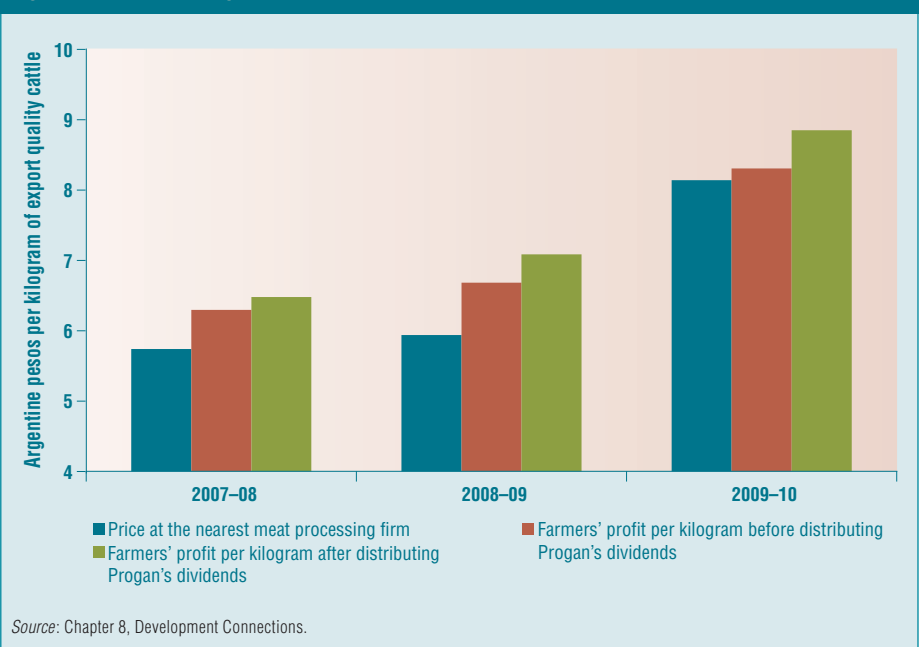
An evaluation was conducted of the impact of TRAZAR on the income and welfare of the small-scale farmers. A control group of forty

farmers from Santa Fe who shared similar pre-program characteristics in terms of scale, region, income, and problems as those in TRAZAR was compared to a group of 40 TRAZAR farmers, 24 of whom remained in the program.

According to the evaluation, TRAZAR fulfilled its overall objective of strengthening the competitiveness of cattle farmers in the international meat market by complying with traceability requirements for the herd. Since 2005, Progan has been assigned a portion of the Hilton quota (the highest value exports to the EU). The farmers’ improved competitiveness has boosted the profitability of the small- and medium-scale enterprises involved.

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Figure 2. Income of Progan Farmers



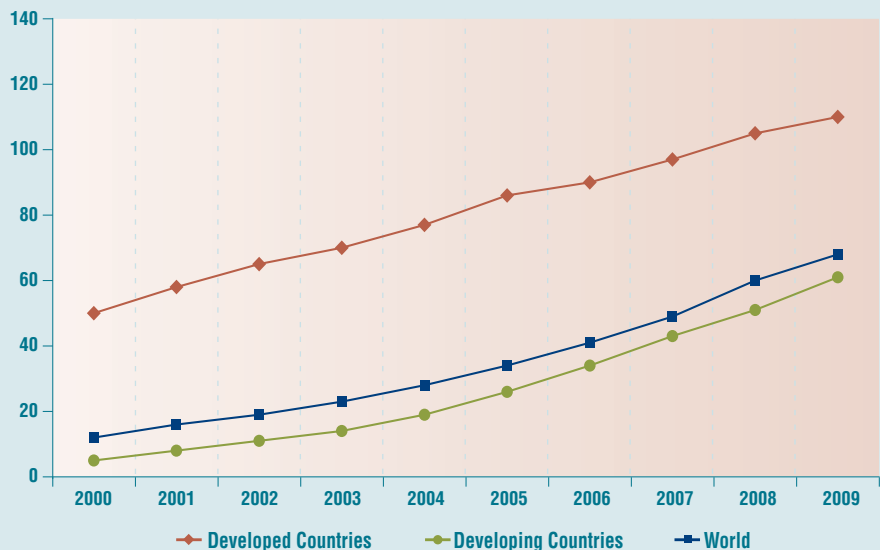
# Dial D for Development

When it comes to the poor, telephony is the ICT that will have the greatest penetration and impact. Telephony is important not only as a channel to improve access to information and communications, but also as a prerequisite for more advanced technologies such as the Internet. However, Internet service penetration is still low; the majority of Internet users are in developed countries and the more affluent segments of developing country populations. Mobile telephony, on the other hand, has emerged as the most important ICT for low-income countries, and as the principal gateway to increased ICT access and use. Among its numerous advantages, mobile telephone infrastructure can be installed without ever deploying the expensive network of wires necessary for land-based phones.

The use of mobile phones has tangible economic benefits, improving agricultural and labor market efficiency, as well as producer and consumer welfare. These effects can be particularly dramatic in places where mobile phones represent the first modern telecommunications infrastructure of any kind. Rural areas of developing countries had the least access to telecommunications technology before the introduction of mobile phones, which are now being adopted at break-neck rates.

The explosion in mobile phone penetration rates in developing countries points to the role of mobile telephony as a “digital bridge” that will help many developing countries reduce the connectivity divide that separates them from others with a more developed fixed-line infrastructure. Figure 3 shows the evolution of mobile phone subscribers per 100 inhabitants in the developed and devel-

Figure 3. Mobile Telephone Subscribers per 100 Inhabitants



Source: Source: Chapter 8, Development Connections.

oping world. Although in 2009 mobile phone penetration was almost twice as high in developed economies as in developing ones, the divide is expected to narrow in the next few years, as mobile markets reach the saturation point in developed economies and continue their spectacular growth in developing countries.

In rural areas, increased access to mobile phones and associated applications and services may have a particularly important impact on poverty. In many developing countries, markets are dispersed and communications infrastructure is poor, so the potential for inefficiency in the allocation of goods across markets is great. By improving access to information, ICTs may help poorly functioning markets work better and thereby increase incomes, lower consumer prices, or both.

Evaluations of ICT information systems for agricultural producers in Colombia and Honduras illustrate this potential. These programs are innovative interventions to increase profitability among agricultural producers in the region. For years, support programs for farmers and small producers have focused on providing technical assistance, credit, and infrastructure investment. In very few cases have interventions focused on reducing information gaps between farmers and markets that allow intermediaries and wholesalers to take advantage of the asymmetries.

Thanks to ICTs, Honduran vegetable growers are better able to negotiate prices for their produce and obtain higher returns. Vegetable growers assisted by the Entrenamiento y Desarrollo de Agricultores (EDA) served as

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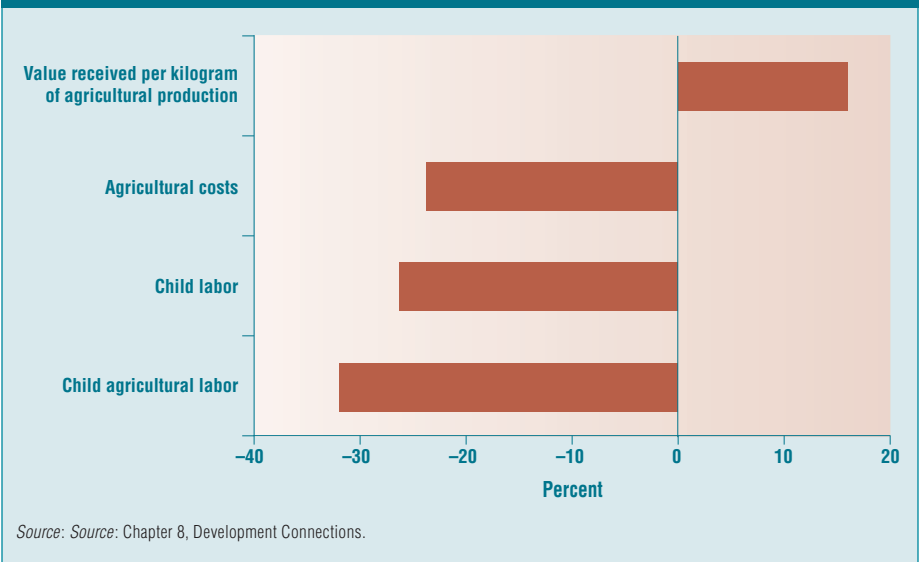
# Dial D for Development

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a representative sample of Honduran vegetable producers. Farmers were sent SMS text messages containing market prices for high-value vegetables in the markets of Tegucigalpa and San Pedro Sula. Then these farmers were asked about the benefits of having price information. More than 90% of the farmers surveyed answered “Yes” to the question of whether they obtained some benefit from receiving the information. For six of nine crops, the farmers who received market price information via SMS lowered price differentials against average market prices, compared to farmers who did not receive the SMS messages. Farmers with access to SMS reported landing prices that were 12.5% higher, on average, thanks to better market information.

In Peru, a study examined the impact of installing public pay phones in isolated villages in rural areas to identify the effects of telecommunication technologies on agricultural productivity and child labor. The study exploited a quasi-natural experiment, in which the Peruvian government through the Fund for Investments in Telecommunications (FITE) provided at least one public (satellite) pay phone to 6,509 rural villages that previously had no communication services (either land lines or cell phones). The main results of this study, displayed in Figure 4, suggest that the price received per kilogram of agricultural production increased by 16% following the installation of the phones, while agricultural costs fell by 24%. Together, these impacts imply a 20% increase in agricultural productivity. Moreover, as family incomes grew, the need for children to work the fields lessened, resulting in declines in child labor and child agricultural labor of 32% and 26.3%, respectively.

**Figure 4. Effect of Provision of Public Pay Phones on Agricultural Productivity and Child Labor in Rural Peru**



In an attempt to establish a link between access to telephone services and household income, another study took advantage of a quasi-natural experiment in Peru in which the government required the privatized telecommunications company, Telefónica del Peru, to randomly install and operate public pay phones in small and isolated rural towns following privatization in 1994. Public telephones were distributed across the country, although somewhat more heavily in the Andean region, where poverty is more acute than in the rather unpopulated Amazon region in the west, or the relatively richer coastal region. A household survey was administered to a representative sample of towns. At the time of the survey, half the towns had at least a public telephone installed by the privatized company in the most accessible part of the town, such as the municipal authority building or the town’s main shop. The control group consisted of the remaining towns,

where the lack of public telephone service reflected a supply constraint more than lack of demand.

To better understand the channels by which access to public telephones may impact households, the study used three measures of per capita income: total annual household per capita income, regardless of source; non-farm per capita income; and farm per capita income only. Analyzing farm and non-farm income separately takes into consideration the economics of rural households. Non-farm income helps families make ends meet when farm income goes through its typical cyclical declines. The results showed that the availability of a rural public telephone installed by the privatized firm in the town or village is associated with approximately 20% higher per capita income, 16% higher per capita non-farm income, and 18% higher per capita farm income.

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# Tech Savvy in a Developing Context

**C**ontext matters. A technological solution in one country may be no solution at all in another. This is one of the key insights derived from the findings of the latest IDB research. With adequate economic policies in place, governments can take great advantage of ICT tools for development. However, while potentially very useful, ICT is not a silver bullet. The following list provides policymakers and others with lessons that may be helpful as they consider technological investments in Latin America and the Caribbean.

*Be sensible and recognize that ICTs are not an end.* While Latin America and the Caribbean still lag in terms of overall ICT penetration, policymakers are tempted to “load up” on ICT-related hardware and software in order to catch up and reduce the digital divide. This is the wrong policy. ICTs are a means to an end—not the opposite. Policies must be sensible and consonant with the realities of the national landscape. Policymakers should beware of fads, internalize cost-benefit considerations and, in particular, consider opportunity costs. Newer does not mean best.

*Define policy goals in terms of use, not access.* Policy goals are potent conduits for prioritizing and using resources. Hence, they should be defined so as to achieve certain milestones that are expected to generate positive impacts. The evidence shows that access alone does not generate impact, but that certain types of use do. Therefore, countries should aim to attain goals defined in terms of achieving certain measures (and types) of use, rather than to extend mere access.

*Foster cooperation to develop public goods.* The interest in using ICT in

different sectors is growing among countries in the region. There are important ways in which countries can cooperate to increase their chances of success. To do so, they should channel resources to activities that generate benefits for all (public goods), either through their own domestic spending or by pooling resources internationally. The first of such activities is the implementation of large-scale rigorous evaluations. These evaluations generate significant benefits for all countries in the region, as they produce evidence about what works and how to improve effectiveness. However, such evaluations are costly and can carry political risks, as some of their results may not be what was expected. Countries (and international donors) must be able to absorb bad news (negative or null results) and adjust programs or activities accordingly.

*Explore private-public partnerships.* Private firms, especially those producing mass market goods, are striving to make the most of ICTs in the developing world in both urban and rural areas. They are exploring countless innovative ICT applications that range from product placement on Internet-based soap operas to Internet boats that bring web connectivity to one port a day. For different reasons, multilateral institutions and the public sector have the same interests. This perfect storm provides a unique opportunity for potentially very fruitful collaboration.

*Encourage large-scale projects, to increase relative returns to investments.* Producing computer software, say, to translate from Spanish to Quechua, requires significant fixed costs that are spread over the number of

computers that will use it. In small programs, producing specialized software is economically unfeasible. But as programs expand, the returns to investing in software increase dramatically. For example, for a laptop program that has distributed 1 million computers in a country, it makes perfect sense to spend US\$10 per computer in software (a tiny part of the total cost of ownership). This amounts to US\$ 10 million, clearly a budget large enough to fund the development of sophisticated software.

This cost-benefit equation is similar to the development of a vaccine. Its production entails large fixed costs, and the ultimate outcome is unclear. Once developed, significant testing is needed to assure its effectiveness. But once produced and tested, the marginal costs of using the vaccine an additional time are negligible. Countries could pool resources for the development (and testing) of a variety of software and produce a free inventory of tested software. How can countries agree to fund these activities? Multilateral institutions may be the solution. They are mandated to fund activities to foster development in the entire region. What better allocation of funds than to produce certain public goods that will be enjoyed by most of their members?

*Recognize that one seagull does not a summer make.* The most important things to learn from any evaluation relate to its lessons for future policies. It is natural to want research findings not to be too specific, but to be applicable to guide practice in other settings. However, this is seldom warranted. A special case of the general problem of external validity is scaling up. Much can change when a pilot

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program is scaled up: the inputs to the intervention can change, the outcomes can change, and the intervention can change. The actual impacts of scaling up can differ from the trial results because the socioeconomic composition of program participation varies with scale. Trial results could over- or under-estimate impacts on scaling up.

For all these reasons, policy-makers should not be satisfied with limited ICT evaluations. Longer-term randomized trials repeated across varying contexts and scales should be used to decide what works and what does not. This is particularly important both from the perspective of assessing development effectiveness and for assuring the reliability of the policy applications. A common criticism of randomized controlled trials is that they have little validity beyond the

specific exercise undertaken. Repetition in different contexts and scaling up go a long way toward improving their general applicability, as well as their development effectiveness.

*Be aware that complementarities are essential.* ICTs do not arise and spread in a vacuum. The quality of institutions and regulations, skills of the population, and physical infrastructure are all crucial to the success of ICT applications. In short, ICT technology does not replace the nuts and bolts of everyday life; it complements them.

ICTs are a potentially effective weapon for fighting poverty and advancing development. They can help close information gaps, spread the knowledge available to a broader sector of the population, and expand

the opportunity frontier of the most vulnerable sectors. Armed with more and better information, the poor can be better equipped to act on their own behalf, boost their earning potential, and use their own knowledge and abilities to lift themselves out of poverty.

However, people with low levels of education are still at a disadvantage and unlikely to reap the full benefits of new technologies, including broader access to knowledge and information. The poor may face special constraints in accessing ICTs and using them for their specific needs. ICTs are not a magic wand that put dreams of wealth and progress in everyone's hands. Improving the skills of the population and the quality and level of physical infrastructure are crucial to make these dreams come true.

## A Lesson on Computers in Schools

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students spent studying math—which, in turn, may have been inspired by the attraction the technology holds for children.

In addition to the use of CAI in areas such as math and language, in programs where computers can be used to support teaching practices, teacher training plays a critical role. Hence, carefully planning the component, and allowing sufficient funds to support the needed complementarities, such as teacher training, should be prioritized.

While research has demonstrated mostly null effects of computer access at school on educational achievement, recent research has shown that

increased computer access at home can actually have *negative* consequences as it may lure children away from studying to play computer games and other non-school-related activities. These negative effects are concentrated among students with weaker adult supervision. Programs that increase access at home should take these considerations seriously into account and implement mechanisms to ensure proper use. In particular, computers could be loaded with interactive educational software and certain competitions can be launched to stimulate their use. Also, violent and sexual content should be blocked.

The experience to date with ICT in schools offers several lessons to be learned:

- Experiment and evaluate.
- Expand interventions gradually.
- Plan (and budget) for all necessary inputs.
- Focus existing computer access on uses that have proven to be effective: honing ICT skills and pursuing CAI.
- Define policy goals in terms of use, not access.
- In programs that distribute laptops to students, ensure that they are used properly at home.



## New Publications

Available in English only unless otherwise stated.

### WORKING PAPERS

*Agosin, Manuel R.,  
Nicolas Grau, and  
Christian Larrain*

#### **Industrial Policy in Chile (IDB-WP-170)**

This paper studies three horizontal and two vertical policy instruments in Chilean industrial policy for small and medium enterprises (SMEs). The horizontal instruments are: i) a guarantee program for borrowing by SMEs; ii) a small subsidy to new exports; and iii) the innovation subsidies provided by the Corporación de Fomento de la Producción (CORFO). The vertical policy instruments are the Fundación Chile (FCh), a semi-public entrepreneur-cum-venture capitalist organization, and a CORFO program. Most programs are well designed, but lack sufficient funding. Prioritizing needs and consolidating these programs could benefit the country.

*Balsa, Ana,  
Nestor Gandelman and  
Rafael Porzecanski*

#### **The Impact of ICT on Adolescents' Perceptions and Consumption of Substances (IDB-WP-219)**

This paper reports the results of a three-month randomized controlled trial to estimate the impact of Internet and mobile telephone short message services (SMS) on adolescents' information about substances and rates of consumption. A low percentage of participants logged on to the Web platform, but most participants were reached through e-mails and SMS. The intervention raised the awareness that certain substances

were drugs, but consumption habits changed little.

*Balsa, Ana and  
Nestor Gandelman*

#### **The Impact of ICT on Health Promotion: A Randomized Experiment with Diabetic Patients (IDB-WP-221)**

This paper summarizes a randomized experiment to study the effects of an Internet-based intervention on type 2 diabetes patients in Montevideo, Uruguay. A specially designed website and an on-line social network allowed participants to navigate freely, download materials, and interact with other diabetics and specialists. No significant impact was found on participants' knowledge, behavior, or health. Only a minority of patients logged on to the website, and most were only reached by email and mobile text (SMS).

*Bastos, Paulo and  
Julian Cristia*

#### **Entry and Quality Choices in Child Care Markets (IDB-WP-225)**

This paper draws on rich data on child care centers in São Paulo to examine the role of household income in shaping the entry and quality choices of private suppliers. It documents three main facts: i) entry rates are considerably higher in high-income districts; ii) the quality of provision is highly heterogeneous and increases systematically with local household income; and iii) many centers operate below recommended quality standards, especially in low-income districts. These findings agree with a model that suggests providers adjust the quality of

care to the consumer's ability to pay. Market-driven heterogeneity in the quality of provision is key to understanding the effect of regulations on the supply of child care.

*Bastos, Paulo,  
Lucio Castro,  
Julian Cristia and  
Carlos Scartascini*

#### **Does Energy Consumption Respond to Price Shocks? Evidence from a Regression- Discontinuity Design (IDB-WP-234)**

This paper exploits unique features of a new tariff schedule for natural gas in Buenos Aires to estimate the short-run impact of price shocks on residential energy use. The estimates reveal that when the utility bill increases, consumers promptly cut their gas consumption substantially. Hence, policy interventions via the price mechanism, i.e. price caps and subsidies, are powerful instruments to influence residential energy use patterns.

*Benigno, Gianluca,  
Huigang Chen,  
Christopher Otok,  
Alessandro Rebucci and  
Eric Young*

#### **Financial Crises and Macro-Prudential Policies (IDB-WP-238)**

This paper studies the inefficiencies associated with borrowing decisions in a two-sector small open production economy, finding that this economy is much more likely to display under-borrowing than over-borrowing in normal times. As a result, macro-prudential policies to minimize the

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probability of the crisis might reduce welfare in production economies. The analysis shows a much larger scope for welfare gains from policy interventions during financial crises. In other words, ex post or crisis-management policies dominate ex ante or macro-prudential ones.

*Blanco, Mariana and  
Juan F. Vargas*

### **Empowering IDPs with SMS: A Randomized Controlled Trial in Bogota (IDB-WP-222)**

This paper studied whether the use of short message service (SMS) technology effectively informed Bogota's population of internally displaced persons (IDPs) about its eligibility to receive social benefits. Half of the sample population was randomly informed of their eligibility via SMS and their awareness of available benefits was estimated. On average, treated households are more aware of their rights; however, awareness varies across benefit type. The study recommends expanding the use of SMS as a policy instrument.

*Butler, Ines,  
Ricardo Rozemberg and  
Gabriel Sánchez*

### **Productive Development Policies in Argentina (IDB-WP-193)**

This study seeks to understand how micro-level productive development policies (PDPs) in Argentina succeeded in a challenging environment, what kinds of mechanisms ensured adaptation and learning, and how these PDPs evolved. Of importance is not only policy design and implementation, but also the policymaking. The paper presents three case studies: i) the Argentine Tech-

nology Fund (FONTAR), a horizontal PDP; ii) the National Institute of Agricultural Technology (INTA), a vertical PDP; and iii) the application of both horizontal and vertical PDPs to the biotechnology sector.

*Carrillo, Paul,  
Mercedes Onofa and  
Juan Ponce*

### **Information Technology and Student Achievement: Evidence from a Randomized Experiment in Ecuador (IDB-WP-223)**

This paper studies the effects of information and communication technologies (ICT) on educational achievement in a program based in Guayaquil that provides computer-aided instruction in math and language to students in primary schools. The program had a positive impact on math test scores and a negative but statistically insignificant effect on language scores. The impact is heterogeneous and much larger for high-achieving students.

*Cuevas, Mario,  
Sigfrido Lee and  
Bismarck Pineda*

### **Industrial Policy in Guatemala: A Case of Policy Inertia under Changing Paradigms (IDB-WP-169)**

This paper reviews productive development policies (PDPs) in Guatemala, focusing on programs related to market and government failures. The main hypothesis is that non-trivial contradictions within the set of PDPs and its implementation framework render policy instruments ineffective. On this basis, and in light of international practices, the study presents recommendations for improving the

design and implementation of Guatemala's PDPs.

*Fernandez, Marcos A.*

### **Políticas de Desarrollo Productivo en Panamá: Auto-descubrimiento y fallas de coordinación (IDB-WP-172) (Productive Development Policies in Panama: Self-Discovery and Coordination Failures) (Available in Spanish only)**

This document analyzes productive development policies in 5 case studies: i) promotion of export services ii) Promotion of export goods iii) promotion of free zones iv) subsidized credit for popular housing, and v) subsidized credit for agriculture. All cases present the history, justification as a function of the externalities to be resolved, public-private coordination processes and results.

*Fernández-Arias, Eduardo and  
Eduardo Levy Yeyati*

### **Global Financial Safety Nets: Where Do We Go from Here? (IDB-WP-231)**

This analysis of the global financial safety net during the 2008–2009 crisis indicates that the net for emerging markets remains full of holes despite recent stitches. This paper proposes an effective international lender of last resort (ILLR) for systemic liquidity crises based on: i) an automatic trigger to access the facility; ii) unilateral country prequalification to the facility during Article IV consultations; and iii) liquidity funded by the world's "issuers of last resort." These principles would support a reliable ILLR without the costs of inefficient reserves. The facility would be preventive and have minimal risk of moral hazard.

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*Hallerberg, Mark and  
Carlos Scartascini*

### **Economic Crisis and Fiscal Reforms in Latin America (IDB-WP-235)**

This paper explores the connection between economic crises and fiscal institutional reforms in Latin America. It reviews the literature and provides five hypotheses about why, and under what circumstances, crises would promote reforms. The empirical evidence shows that debt crises make reforms more likely but banking crises alone reduce pressure for fiscal institutional reforms. Political institutions are also important. If the electoral system encourages the personal vote, the country is more likely to reform. This evidence may become useful for predicting the likelihood of reforms in the developed world.

### **TECHNICAL NOTES**

(The following technical notes are available in Spanish only)

*Bartholo, Leticia and Ricardo  
Rodrigues Dutra*

### **La efectividad de las redes de protección social: El rol de los sistemas integrados de información social en Brasil (IDB-TN-182) (The Effectiveness of Social Protection Networks: The Role of Integrated Systems of Social Information in Brazil)**

This analysis focuses on the CadÚnico program in Brazil, which was created in 2001 to support the implementation of an income transfer program for the poor and improve their access to sources of social protection. The study describes the design, operation and implementation of CadÚnico to assess its consolidation as the only

instrument for delivering these social programs to beneficiaries and to identify possible registry improvements.

*Covarrubias, Francisco,  
Ignacio Irarrazaval and  
Maria de los Angeles Morandé*

### **La efectividad de las redes de protección social: El rol de los sistemas integrados de información social en Chile (IDB-TN-183) (The Effectiveness of Social Protection networks: The Role of Integrated Systems of Social Information in Chile)**

This study analyzes the Integrated System of Social Information (SIIS) as the only registry of beneficiaries in Chile and details its operation to improve the country's social protection strategy. It concludes that the system's integrated data is extremely useful for providers of social benefits. For instance, the database provides information on potential users, and allows for follow-up of beneficiaries as well as evaluation of program results and impact.

*Gomez Hermosillo, Rogelio*

### **La efectividad de las redes de protección social: El rol de los sistemas integrados de información social en México (IDB-TN-195) (The Effectiveness of Social Protection Networks: The Role of Integrated Systems of Social Information in Mexico)**

This study deals with the design and operation of the Integrated System of Beneficiary Information and Identification (SIIB) in Mexico. It is based on the information and identification system for beneficiaries of the *Oportunidades* program from 1997–2006. It concludes that the *Oportunidades* system is the principal database for

information on marginal geographical areas and low-income populations.

*Pessino, Carola and Ricardo  
Fenochietto*

### **La efectividad de las redes de protección social: El rol de los sistemas integrados de información social en Argentina (IDB-TN-187) (The Effectiveness of Social Protection Networks: The Role of Integrated Systems of Social Information in Argentina)**

This study analyzes the experience of the National Tax and Social Identification System in Argentina, whose objective was to identify the social and fiscal attributes of people through a coordinated system of databases from State and private sources in order to improve the focus of social spending and detect cases of tax evasion. It presents the main lessons from the SINTyS system and offers suggestions as to how to replicate it in other parts of the region.

*Rosero, Lucia Mina*

### **La efectividad de las redes de protección social: El rol de los sistemas integrados de información social en Colombia (IDB-TN-192) (The Effectiveness of Social Protection Networks: The Role of Integrated Systems of Social Information in Colombia)**

This study analyzes the effectiveness of numerous Colombian governmental programs oriented toward improving the quality of life of the needy. The research explains the principal methods by which Colombia structures its network of information systems on social program beneficiaries and how these systems are tapped. It

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highlights both the advances and the major lessons from these programs.

### OUTSIDE PUBLICATIONS

*Azevedo, Viviane and Cesar Bouillon*

#### **Intergenerational Social Mobility in Latin America: A Review of Existing Evidence**

*Economic Analysis Review, Vol 25, No 2 (2010) pp. 7–42.*

This article reviews evidence on intergenerational social mobility in Latin America. Results indicate that mobility is low in the region, even when compared with the U.S. and U.K., which rank low on social mobility. The evidence also suggests high levels of immobility at the income distribution's lower and upper tails. While intergenerational education mobility has improved in recent decades, which may increase income mobility for younger cohorts, overall the

region still presents lower intergenerational social mobility. These results may be associated with social exclusion, low access to higher education, and labor market discrimination.

*Berlinski, Samuel, Sebastian Galiani, and Patrick McEwan.*

#### **“Preschool and Maternal Labor Outcomes: Evidence from a Regression Discontinuity Design”**

*Economic Development and Cultural Change 59, pp: 313–344.*

In developing countries, employment rates of mothers with young children are relatively low. This paper analyzes how children's preschool attendance affects maternal labor market outcomes in Argentina. It shows that four year-olds with birthdays on June 30 are much more likely to attend preschool than children born on July 1, given enrollment-age rules. Regression-discontinuity estimates using this variation suggest that when

the youngest child in the household attends preschool, mothers are more likely to be employed full-time. Preschool attendance of children who are not the youngest in the household had no effect on maternal labor outcomes.

*Chong, Albert and Mark Gradstein*

#### **Firm-level Determinants of Political Influence**

*Economics and Politics, Vol. 22, Issue 3, pp. 233–256. Nov. 2010.*

This paper uses a large cross-country survey of business firms to assess their influence on government policies. When controlling for endogeneity, it finds that such an influence is associated with larger firms and to a lesser extent with government ownership, but not with the degree of competition. Also, firms' perception of being politically influential is enhanced with the country's level of institutional quality.

## Beefing Up Quality for the International Market

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Figure 2 shows that by selling to Progan, farmers received a higher price than when they sold their production to the nearest meat processing firm. (This differential would represent their opportunity cost.) Furthermore, Progan members also participated in the profits of the cooperative. Therefore, when Progan pays out dividends, the income of its members increases even more. In recent years, the income of the benefi-

ciaries that sold to Progan was between 8% and 20% more per kilogram of high quality export beef sold, considering the higher baseline price paid by Progan and their share in the paid out dividends of the cooperative.

TRAZAR can be regarded as a case of applying ICT methods to help solve market failures due to problems of coordination and asymmetric information.

## Dial D for Development

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Living in poverty is not only about not having enough money to purchase valuable goods and services; it is also about lacking access to the resources to break out of poverty and guarantee well-being. Access to information—through something as simple as a phone call—can enable the poor to use their own knowledge and strengths to escape poverty traps.



## Look Who's Talking

*This section of the newsletter spotlights presentations or events sponsored by RES in recent months.*

### **Mitchell Seligson and Elizabeth Zechmeister presented “Democratic Political Culture in Hard Times: Results from the 2010 AmericasBarometer.” January 20, 2011**

The 2010 AmericasBarometer survey is notable for its methodology as well as its findings. Questionnaires were administered in 26 countries of the Americas, the only sizeable exceptions being French Guyana and Cuba, and in 15 indigenous languages as well as European languages. The unusually large sample consisted of 43,990 interviews conducted in person in all countries other than the United States and Canada by trained interviewers. Data within countries were stratified according to subnational region and rural/urban residence.

The overarching question of the 2010 survey was whether the global economic downturn weakened citizen support for key components of democracy, thus slowing or even undermining the democratic consolidation that many countries of the Americas have experienced in recent decades. This question is particularly important in light of the downturn's highly varied impact across as well as within countries. Most but not all countries, for instance, experienced GDP declines, and the percentage of households experiencing job loss ranged from 39.5% in Mexico to 9.0% in Suriname. While within countries the household incomes of

the poor were hit harder than other groups, 22.8% of respondents reported that their incomes had actually increased in the preceding two years.

Respondents' perceptions of the origins and implications of the economic downturn displayed several interesting patterns. First, 91.4% believed their country was experiencing an economic crisis; half of these perceived the crisis as “very serious” and half considered it “not very serious.” Within this overall figure, however, major cross-country variations occur. Percentages perceiving the economic crisis as “very serious” ranged from 81.2% in Jamaica, followed by 79.6% in the United States and 74.8% in Honduras, to a low of 10.4% in Uruguay.

Second, among those who perceived a crisis, respondents largely blamed previous or current domestic governments, followed by the economic system of the country and the citizens themselves. Only 7.8% blamed rich countries, with national percentages ranging from 19.7% in Costa Rica to 0.2% in the United States; more highly informed respondents, though, were more likely than others to blame rich countries for causing the crisis.

Third, and most significantly, support for democracy and the legitimacy of political systems remained surprisingly resilient in the face of economic crisis. Across all 26 countries sampled, 69.8% of respondents agreed with the statement “Democracy may have problems, but it is better than any other form of government.” This figure is down only slightly from 71.1% in 2008. The

lowest national percentage, Peru's 60.1%, nonetheless represents a substantial majority, and the highest national percentage, Uruguay's 86.2%, appears overwhelming. Support for individual countries' political systems actually increased from 51.5% in 2008 to 53.2% in 2010. This increase in legitimacy may be associated with the countercyclical and pro-poor policies implemented by governments during the economic downturn. Within countries, changes in system support are related to changes in perceptions of economic performance, again with significant variation across countries.

Vulnerabilities nonetheless remain in the hemisphere's democratic consolidation. While stable democracy is associated with both strong support for the system of government itself and high levels of tolerance for disagreement with the system of government as well as the current administration, some countries display relatively low levels of support for one or the other. In eight of the survey's 26 countries, less than 50% of the population expressed support for political tolerance. A combination of low political tolerance and low system support in three of those countries—Haiti, Peru and Paraguay—suggests that these democracies are the most at risk.

Additional data provide the basis for a “triple dissatisfaction index” that adds to system support and political tolerance an evaluation of regime economic performance. Trends in this index over the 2004–2008 period were correlated with instabil-

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## Look Who's Talking

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ity in Honduras in 2009, as well as Chile's stability in the wake of the 2010 earthquake. Of particular note is that natural disasters, corruption, crime and terrorism have distinctly negative effects on system support. It is not surprising then, that Haiti has displayed extreme values on the triple dissatisfaction index, given the combination of existing economic challenges and the January 2010 earthquake.

Finally, attitudes toward the armed forces and police have a complex and evolving relationship with democratic consolidation. In most

countries, the armed forces enjoy a high level of trust, particularly in countries where the government is seen as protecting human rights. At the same time, trust in the armed forces is positively related to both support for democracy and support for military coups. A further complication is that, while trust in the armed forces is greater than trust in the police—perhaps because of citizens' greater contact with the latter, who may seek bribes—perceptions of police corruption erode overall trust in people in uniform.

Preliminary work suggests that

a challenge to democracy may arise from the perceived success of hard-line policies against crime. In such settings, most notably in Colombia and Mexico, there is greater support for "rule by an iron fist" (in Spanish, *mano dura*), as a perception of competence in crime reduction is transferred to a perception of competence in the larger domain of politics. Conversely, approval of "soft-line" approaches involving crime prevention and rehabilitation of criminals is associated with low levels of support for *mano dura* rule in Guatemala and Uruguay.

## Network News

[www.iadb.org/res/researchnetwork](http://www.iadb.org/res/researchnetwork)

### Latin American and Caribbean Research Network

The following proposals have been selected for the research project "**Subnational Revenue Mobilization in Latin America and the Caribbean:**"

- Argentina: *Subnational Revenue Mobilization in Argentina*. FIEL – Fundación de Investigaciones Económicas Latinoamericanas
- Argentina: *Options for Replacement of the Gross Receipts Tax in Argentina*. FIEL – Fundación de Investigaciones Económicas Latinoamericanas
- Colombia: *Subnational revenue Mobilization: Case Study of Colombia*. CEDE – Centro de Estudios Económicos. Universidad de los Andes
- Mexico: *Subnational Revenue Mobilization in Mexico*. IMCO – Instituto Mexicano para la Competitividad A.C.
- Peru: *Subnational Revenue Mobilization in Peru*. Georgia State University – Andrew Young School of Public Policy
- Venezuela: *Subnational Revenue Mobilization: The Case of Venezuela*. UCAB – Universidad Católica Andrés Bello, Escuela de Economía – Facultad de Ciencias Económicas y Sociales

The first seminar was held on Dec. 6–7, 2010.

The second seminar will be held May 2–3, 2011 at IDB headquarters in Washington, DC.