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What Works to Improve Lives?

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What Works to
FOSTER PRODUCTIVE SECTOR DEVELOPMENT

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PREFACE

This publication is one of a series of five monographs produced by the Inter-American Development Bank to take stock of the lessons learned from impact evaluations of investments supported by the IDB Group for over a decade across a wide range of economic and social development sectors. The aim of the evaluations and these five monographs is to identify policies and programs that work, enhance the use of rigorous evidence for decision-making, and ultimately improve the lives of the people of Latin America and the Caribbean.

The coverage of IDB Group impact evaluations discussed in the five monographs is not meant to be exhaustive of all evaluations supported by the Group, but rather to summarize lessons on topics with multiple completed evaluations on a common intervention or outcome.

This monograph is authored by Gustavo Crespi, María Paula Gerardino, Edwin A. Goñi Pacchioni, Oscar A. Mitnik, Rodolfo Stucchi, and Christian Volpe Martincus. Carola Álvarez, Leonardo Corral, Andrés Gómez-Peña, and Sebastián Martínez coordinated the production of the five monographs and provided strategic input and guidance throughout the process. Gabriel Cassaburi, Eduardo Fajnzylber, Maria Carmen Fernández Diez, Alessandro Maffioli, Rafael Novella, Laura Ripani, and Graciana Rucci provided valuable comments on earlier drafts and Solis Winters provided outstanding research assistance. The monograph series was edited by David Einhorn. Gaston Cleiman led art direction and graphic design of this publication.

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What Works to Improve Lives?

INTRODUCTION

The IDB Group has supported the region's productive sector through programs and policies directed toward workers, private firms, and entrepreneurs, and through trade and investment promotion.

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The countries of Latin America and the Caribbean need to increase their productivity if they want to reach the per capita GDP levels of more developed economies (Cole et al. 2005; Pages 2010). The level of income in a society is related to the capacity of private firms to grow as successful businesses drive economic growth and create jobs (Hsieh and Klenow 2014).

The IDB Group has supported the region's productive sector through programs and policies directed toward workers, private firms, and entrepreneurs, and through trade and investment promotion. Several types of productive development programs and policies have been designed to help overcome market failures related to externalities, asymmetric information, economies of scale, market power, coordination, and other failures that manifest themselves in problems such as lack of access to training and financing, low returns to investments, and high costs of searching for business opportunities and finding commercial partners abroad. These market failures hinder the skill development of workers, innovation, productivity, and firm growth. The supported programs are aligned with United Nations Sustainable Development Goal 8 to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.[1]

This monograph studies the impact of these programs and policies, provides evidence generated by the IDB Group, and contributes new knowledge about what could work best to foster development of the productive sector in the region. In particular, it discusses interventions to **(1)** provide training to workers and entrepreneurs; **(2)** improve access to finance for micro, small, and medium-sized enterprises (MSMEs); **(3)** support entrepreneurs with high growth potential; **(4)** increase innovation and extend the use of technology; **(5)** promote efficiencies through the agglomeration of firms; and **(6)** attain greater internationalization of economies by facilitating trade and promoting investment across borders.

1_ Specifically, the supported programs are aligned with target 8.3: "Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage formalization and growth of micro-, small- and medium-sized enterprises including through access to financial services.".

Based on evaluations of these interventions, the monograph presents some key lessons on "what works" to foster productive sector development:

- **Provide training to workers and entrepreneurs**. While it is difficult to generate an impact on overall employment levels with training programs, the evidence shows that such programs can increase the quality of employment (i.e., formality rates and, in some cases, earnings) in the short and long run. These impacts vary depending on gender and, sometimes, on education and age. Training that emphasizes the development of soft skills has also been successful in improving worker productivity and nonlabor market outcomes.[2] Interventions to expand the skill set of entrepreneurs can lead to the adoption of better business practices, but more traditional programs rarely impact business performance. Soft skills or simple rules-based training, on the other hand, can positively impact performance (i.e., sales and profits). Mentoring entrepreneurs, either individually or in groups, may also improve management skills and performance.

- **Improve access to credit.** Channeling funds to financial intermediaries can improve credit conditions for MSMEs as well as the performance of MSMEs that already have access to credit, but its effect on unbanked MSMEs is less clear. Guarantee programs can improve MSME access to finance and MSME performance. However, only longer-term loans seem to impact investment and employment outcomes. Information-sharing can improve access to credit by reducing asymmetric information and by creating repayment incentives. Innovative programs to solve market failures (such as asymmetric information) are needed to improve access to finance for underserved or unbanked MSMEs.

- **Promote entrepreneurship with high growth potential.** Entrepreneurs who receive public support can have better chances of surviving and growing. However, adverse selection mechanisms

2_ Noncognitive, soft, or socioemotional skills are those skills associated with an individual's personal qualities, attitudes, beliefs, personality traits, and behavior (IDB 2020).

may reduce the success of entrepreneurship programs. These selection mechanisms should factor in characteristics that are proven to be good predictors of success, rather than being based just on subjective evaluations of elevator pitches. In addition, the success of public interventions should go beyond the individual impact on entrepreneurs and include the articulation and dynamization of the ecosystems where entrepreneurs develop. However, more evidence is needed on this.

- **Foster innovation and technology extension.** Matching grants for research and development (R&D) can correct market failures, but the design of an intervention is ultimately key to its success. Innovation policy designs that encourage research collaboration among different actors are preferable to those that simply subsidize intramural R&D. Credit programs might be an effective approach to increasing private investment in innovation. In fact, when the aim of the policy is to increase innovation investment, credit programs are often better than noncredit-based programs because they reduce the fiscal costs of the policy, enhance the sustainability of the implementing organizations, and reduce the likelihood of crowding-out effects. Programs that cofinance technical assistance to small and medium-sized enterprises (SMEs) can be effective in increasing business growth and competitiveness. However, these effects are heterogeneous depending on the type of assistance provided. The intensity of participation does not seem to be as important.

- **Gaining efficiency from agglomeration of firms.** Productive development policies can help internalize the gains of firms operating in common spaces in three ways. First, regional industry-integrated policies that target groups of firms (instead of individual firms) within a specific sector and in a specific geographic location can have substantial and long-lasting positive effects on the supply and demand of firms. However, these policies require major coordination of several actors and simultaneous advancement of several integrated treatments. Second, the benefits of the coordination of firms can also be seen in vertical articulation. Supplier development programs, which aim to improve and

stabilize the commercial linkages between small and medium-sized local suppliers and their large-firm customers, are mutually beneficial. Third, the effects of productive programs targeted to individual firms (rather than agglomerates or chains) can generate spillovers to other firms that were not direct beneficiaries of the programs but that operate in the same space (region or industry) as the beneficiary firms, enhancing the potential gains of agglomeration.

- **Promote trade and investment.** Trade facilitation policies can help firms that are already trading increase their exports and imports and encourage more firms to venture abroad. To increase the benefits of these policies, customs and other border agencies should apply comprehensive and effective risk management systems and streamline administrative processes through electronic trade single windows. In addition, simplified regional international transit systems help reduce the administrative burden on both sides of the borders through coordinated actions across countries, further increasing trade gains. The evidence also shows that trade promotion policies can increase export growth and that investment promotion increases the probability that a multinational firm establishes a first affiliate in the respective country. Trade and investment promotion are estimated to have their strongest impact on activities or firms facing the most severe information problems. Providing bundled support services (i.e., counseling, missions and fairs, and trade agendas) throughout the export development process is more effective in helping firms increase and diversify their foreign sales than are isolated actions.

What Works to Improve Lives?

What Works to ENHANCE SKILL ACQUISITION BY WORKERS AND ENTREPRENEURS

One of the challenges faced by the countries in the region is to provide their labor force with the skills needed to access and maintain quality jobs, and their entrepreneurs with the managerial skills to improve business practices, performance and survival rates.

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Cognitive and noncognitive skills are key for economic growth and productivity (Barro 1991; Balart, Oosterveen, and Webbink 2018; Hanushek and Woessmann 2012; Sala-i-Martin, Dopplehofer, and Miller 2004). For Latin America and the Caribbean, the evidence shows that investment in developing a skilled labor force was among the main sources of productivity growth in the 20th century (Astorga, Bergés, and Fitzgerald 2011). However, one of the challenges faced by countries in the region is to provide their labor force with the skills needed to access and maintain quality jobs, and to ensure quality and relevant lifelong learning opportunities (Bassi, Rucci, and Urzúa 2014; IDB 2020).

In 2019, 32 percent of firms in the region identified an inadequately educated workforce as a major constraint to their business; 16 percent of young individuals between 18 and 24 years of age were not in education, employment, or training; and 56 percent of adults performed poorly in both literacy and numeracy (IDB 2020). Low education levels have consequences on labor force participation and outcomes. Only 65 percent of individuals with a low level of education (up to eight years) participate in the labor force, compared to 82 percent of those who are highly educated (14 years of education or more). Also, the types of jobs these groups have are quite different: 73 percent of workers with low levels of education have informal jobs, whereas only 30 percent of highly educated workers have such jobs (IDB 2020). These differences are maintained over the worker's life cycle. Conditional on labor force participation, over 55 percent of people with higher educational attainment are employed formally during their 30s and 40s. For those with less education, formal employment peaks at around 20 percent of the labor force during their 30s and 40s (Calero et al. 2017a).

For young people, the first job they get can make a big difference, as entering the labor force through formal employment can have long-lasting positive impacts. In addition, for all workers, the type of firm matters. Data for Chile suggest that the wage growth rate associated with working in high-productivity firms can be as much as three times higher than for those working in low-productivity firms (Calero et al. 2017a). Therefore, policies that help increase the productivity of firms and increase employment in more productive firms can be very significant for workers.

Both general and specific skills need to be developed over a worker's life cycle. However, financial constraints and limited learning opportunities are key barriers for adults to develop skills (Busso et al. 2017; IDB 2020). Although workers acquire experience and on-the-job skills, they are not always recognized by the market (IDB 2020). Only 15 percent of employed workers access training provided or funded by public training institutions (with informal workers and small firms having lower participation rates) (Busso et al. 2017; IDB 2020). For people in the informal sector (particularly those with low educational attainment), training could be the ticket to getting into the formal sector. Those who are self-employed are mostly focused on subsistence rather than high growth, as will be discussed later in this section. Microentrepreneurs often lack the skills they need to manage their enterprises, having been forced by circumstances into entrepreneurship.

In fact, management skills are crucial for all types of enterprises. Well-managed firms perform better in terms of productivity, profitability, and survival rates (Bloom and Van Reenen 2007). Firms in Latin America and the Caribbean tend to be poorly managed (Bloom et al. 2010; Bloom et al. 2012) and score towards the bottom of the management practices distribution (Lederman et al. 2014). However, the evidence shows that small firms in developing countries that follow better business practices have higher survival rates and faster sales growth (McKenzie and Woodruff 2017).

This section presents the evidence generated by the IDB Group on policies that seek to increase the skills of workers and entrepreneurs. The latter training includes interventions that target microenterprises and managers of SMEs.

EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

Evidence on the effectiveness of training programs for workers is quite heterogeneous, but two recent meta-analyses point towards several general trends both globally and for Latin America and the Caribbean. Both review the impact on employment outcomes of active labor market policies, which include not only training but also programs to help individuals attain job readiness and find employment. Card, Kluve, and Weber (2018) analyzed over 200 studies of such policies worldwide and found that, in general, average impacts on the probability of being employed were close to zero in the short run but became more positive two to three years after program completion. They also found that programs that emphasized human capital accumulation, as opposed to programs that facilitated job search, had larger impacts. Finally, they found that there was large heterogeneity across participant groups, with women benefiting the most.

In a similar study focusing specifically on programs in Latin America and the Caribbean, Escudero et al. (2019) analyzed over 50 studies and found results consistent with those of Card, Kluve, and Weber (2018). In addition, they found that the probability of being in formal employment is most likely to be affected positively, and that short-term programs (less than four months or less) are less likely than longer-term interventions to be effective. The IDB Group generated several studies included in these two meta-analyses, as well as others (which find similar heterogeneity in results) comparing earlier and different types of training and labor intermediation programs in the region (Urzúa and Puentes 2010; González-Velosa, Ripani, and Rosas Shady 2012; Flores-Lima, González-Velosa, and Shady 2014; Mitnik, Ripani, and Rosas Shady 2016). McKenzie (2017) offers a critical view of the impacts of active labor market policies in developing countries, highlighting that on average supply-side interventions tend to have modest impacts.

Five main lessons have been learned from several impact evaluations of worker-oriented training programs in the region by the IDB Group and from independent evaluations.

(1) It is difficult to impact employment levels with training programs, but the quality of employment can be improved in the short and long run. Impacts are heterogeneous by gender, and sometimes by education and age.

(2) Training interventions emphasizing soft skills can have effects on worker productivity and on nonlabor market outcomes.

(3) Interventions to expand the skill set of entrepreneurs lead to the adoption of better business practices, but they rarely impact performance.

(4) Simple rules training as opposed to more traditional business training may positively impact performance.

(5) Mentoring entrepreneurs, either individually or in groups, may improve management skills and business performance.

The sections that follow explore each of these five lessons in more detail.

(1) It is difficult to impact employment levels with training programs, but the quality of employment can be improved in the short and long run. Impacts are heterogeneous by gender, and sometimes by education and age.

The evidence shows that training programs increase formality rates for participants, but not overall employment rates. This is consistent with findings in Escudero et al. (2019). Evidence on training programs from randomized control trials is presented in Alzúa, Cruces, and Lopez (2016) for the *entra21* program in Argentina (**IDB Project #RG-M1102**); in

Ibarrarán et al. (2014, 2019) and Acevedo et al. (2017) for the *Juventud y Empleo* program in the Dominican Republic (**IDB Projects #DR-L1006**, **#DR-T1049**, and **#DR-T1103**); and in Diaz and Rosas Shady (2016) for the *Projoven* program in Peru (**IDB Project #PE-T1233**). All three programs focused on young people, but *entra21* and *Juventud y Empleo* included noncognitive skills components, while *Projoven* did not. The impact on formality rates was stronger in the short run (first year) for *entra21* – about 8 percentage points, which is large compared to those of similar programs – but it dissipated over four years. In comparison, impacts on formality rates were stronger in the medium run (three years from completion) for *Projoven* (over 3 percentage points) and in the medium and long run for *Juventud y Empleo* (around 4 percentage points, based on results from Ibarrarán et al., 2019, who followed outcomes for six years after program completion). However, Acevedo et al. (2017) followed a different (later) cohort of *Juventud y Empleo* for three years after program completion and found a short-term impact for women (around 7 percentage points), but no medium-term impact for men or women regarding employment quality. In all the other evaluations, the impacts tended to be stronger for men, with some heterogeneity depending on age and geography.

Other studies have also looked at the effects of these types of programs on earnings and employment. A small-scale innovative training intervention by the nongovernmental organization *Galpão Aplauso*, which used expressive arts and theater as a pedagogical tool along with standard vocational training, was conducted in a favela in Rio de Janeiro in Brazil (**IDB Project #BR-M1062**). Using a randomized control trial, Calero et al. (2017b) found that the program had short-term impacts (4-5 months after participation) on employment and earnings.

A quasi-experimental evaluation by Novella et al. (2018) of a training voucher program in Chile, *Bono Trabajador Activo* (**IDB Project #CH-L1064**) used nonparticipant applicants as a control group and combined matching and difference-in-differences methods. It found a modest positive long-term impact on earnings, but a small negative effect on formal employment. The target population in this case – active or recently unemployed workers of any age – was different from the other programs (oriented to youth), which may partly explain the findings. Also in Chile, an experimental evaluation of vulnerable individuals in a training

program, *Formación para el Trabajo* (**IDB Project #CH-L1064**), found no impacts on skills and positive results on labor outcomes (employment, income) for men, but not for women (Doerr and Novella 2020). This study highlights the role of training quality: higher-quality courses appear to be associated with better outcomes.

A quasi-experimental evaluation by Novella and Valencia (2019) of the *Programa de Apoyo al Empleo* (PAE) (**IDB Project #BO-L1051**) in Bolivia examined the impact of wage subsidies for the experience of a first formal job. The study combined matching and difference-in-differences methods and used as a control group those jobseekers who registered in the PAE and only received information on vacancies. The PAE is not strictly a training program, but, as discussed above, a person's first formal experience can be very important in terms of on-the-job training and the development of skills. The evaluation found a positive impact on employment, formal employment, and earnings in the short run, and on earnings in the long run. The impacts were greater for women than for men, and greater for those with tertiary education.

(2) Training interventions emphasizing soft skills can have effects on worker productivity and on nonlabor market outcomes.

Prada, Rucci, and Urzúa (2019) implemented an experimental intervention in a large retailer in Chile to improve the leadership skills of store managers and the communication skills of sales personnel. They found positive impacts on worker productivity (sales and number of transactions) on average, and even larger effects for managers specifically (over 10 percent for both measures). Novella and Ripani (2016) experimentally evaluated the impact of the *Juventud y Empleo* program in the Dominican Republic (**IDB Projects #DR-L1006**, **#DR-T1049**, and **#DR-T1103**) on teenage pregnancy rates. They found that, in addition to the positive employment impacts discussed earlier, pregnancy rates for women between 16 and 19 years of age who participated in the program decreased by 20 percent, while those of older women did not. The authors suggest two channels

through which this occurs: **(1)** the impact of the program on soft skills; and **(2)** changes in women's expectations about their future prompted by the program. This is consistent with results from Acevedo et al. (2017) for the same program showing that changes in women's expectations translate into greater optimism, higher self-esteem, and lower fertility in the long run. However, Acevedo et al. (2017) show that the impacts for men in the long run in terms of expectations were negative, which the authors associate with men's negative job market experience in the short run.

Evidence of the effectiveness of policy interventions to improve entrepreneurs' skills is mixed. Cho and Honorati (2014) conducted a meta-analysis of the evidence on entrepreneurship programs in developing countries and found that business training had a small impact on the adoption of good practices, but no impact on growth or profitability. In a review of business training and entrepreneurship interventions, McKenzie and Woodruff (2014) came to similar conclusions but pointed out that the included evaluations tended to have small sample sizes and only evaluated outcomes in the short run (usually within one year of the intervention).

(3) Interventions to expand the skill set of entrepreneurs lead to the adoption of better business practices, but they rarely impact performance.

A program in Peru (**IDB Project #PE-M1066**) used soap operas and specially developed practical exercises to train female microentrepreneurs in business practices (such as accounting and marketing). A randomized control trial evaluation of the program by Nakasone and Torero (2014) found both modest and large impacts on the adoption of business practices such as setting a fixed salary for the entrepreneur (5 percentage points compared to a baseline value of 4 percentage points) and keeping better records of potential business contacts (3 to 10 percentage points compared to a baseline of 28 percentage points). However, they found no impacts on business performance, household expenditures, or

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A program in Peru used soap operas and specially developed practical exercises to train female microentrepreneurs in business practices.

women's empowerment. Another randomized control trial evaluation of a training program for small entrepreneurs in Jamaica (**IDB Project #JA-M1037**) compared the effects of providing soft-skills training versus more traditional training on the adoption of good business practices (Ubfal et al. 2019). In the short run (three months), there were positive impacts from the soft-skills training program on business performance (the sales and profits aggregate index increased 0.28 standard deviations) but no impact from the traditional training. However, these differences disappeared within one year. The results were driven primarily by male entrepreneurs.

(4) Simple rules training as opposed to more traditional business training may positively impact performance.

Arraiz et al. (2018) conducted a randomized control trial evaluation of two different approaches to business training of microentrepreneurs in Ecuador (**IDB Project #EC-M1070**): a traditional training program and a heuristics-based program (the latter focusing on easy-to-understand, rule-of-thumb-style business practices). The results showed that while there were no impacts of the traditional training, the heuristics-based intervention had positive impacts one year after program completion not only on the adoption of better practices related to managing and controlling inventory, but also on sales and profits on non-bad days (assessed by customer traffic). The impacts were driven by female entrepreneurs. Box 1 illustrates how the heuristics-based program worked in practice.

Box 1. How Simple Hands-on Training Can Help Microentrepreneurs Manage Their Businesses

Doña Rosalía Sotamba owns a store on the outskirts of Quito, Ecuador in a neighborhood called *Nuevos Horizontes*. She opened the store in 2014 and sells staples such as rice and sugar, as well as fresh products like meat and cheese. She has five children and is the head of her household.

Six years ago, Doña Rosalía took part in a workshop run by her local bank – Banco Pichincha – with which she has a micro loan. She explains what she learned: "Let's say my loan was for US$5,000 and I owe the bank US$150 a month. Every day of the month I have to set aside US$5 to pay back my loan, US$2 for my electricity bill, and US$3 for rent. That is what the Banco Pichincha taught me. Like that, at the end of the month, I don't suffer because I can't pay the bills."

It sounds so simple. But traditional business training programs have had little impact on profits or sales, as outlined in an IDB Group study by Arráiz, Bhanot, and Calero (2019). Microenterprises like Doña Rosalía's make up a staggering 9 out of 10 firms in Latin America and the Caribbean (OECD and CAF 2019). So getting this right is key.

This time, through the partnership with Banco Pichincha, the IDB Group has shown that there might be a better way to conduct business training. And the lessons might be applicable to other projects.

Entrepreneurs who took part in the training increased their sales by 7 percent and profits by 8 percent compared to the group of entrepreneurs that did not receive any training. This occurred because entrepreneurs apparently adopted the few simple rules they were taught, including tips about how to better manage their inventory.

While traditional training teaches entrepreneurs how to calculate their cash flow in a 14-step procedure, this hands-on approach

teaches them how to organize their money so they can easily calculate daily cash movements.

The instructor drew little boxes on the blackboard, said Doña Rosalía. "You'll have a little box here where you will save your US$5 and another one here for electricity. And this other one here is for your personal expenses. We learned that if you earn US$100 a day, you cannot spend those US$100. Before, I used to spend it all and sometimes I didn't have the money to pay my bills."

The simplicity of this business training model was particularly effective among women, who are often taxed with household chores and other unpaid labor in addition to work and do not have the time to attend lengthy workshops and assimilate complex notions in finance.

Irani Arráiz who co-authored the aforementioned IDB Group study, explains: "Most working women are forced to multi-task. But requiring them to focus on a lengthy financial education course and expecting them to put into practice what they learn can be unrealistic when, aside from work, they are also planning the next family meal, several loads of laundry, and a child's birthday."

Thanks to this project, Banco Pichincha learned how to speak the language of its clients, which proved useful for both the bank and the clients themselves. As for Doña Rosalía, she is ready for her next challenge. "Now it would be good if they could teach us computing!"

(5) Mentoring entrepreneurs, either individually or in groups, may improve management skills and business performance.

A randomized control trial evaluation by Martinez and Valdivia (2018) of the *Mujeres Empresarias Liderando el Desarrollo* program in Peru

(IDB Project #PE-M1098), which offered business training to female microentrepreneurs, studied the impact of adding individual or group mentoring (with an average of seven entrepreneurs per group) to an existing business training program. The results 18 and 36 months after participation showed that while group mentoring did not have an impact on business outcomes, individual mentoring appeared to have positive impacts on employment and profits for the subgroups of firms that were relatively bigger and where the entrepreneur was older than 40 years of age. Individual mentoring did not appear to be beneficial for smaller firms and may even have had negative impacts.

Another randomized control trial evaluation in Colombia studied individual versus group-based consulting among enterprises with 10 or more employees in the auto parts manufacturing sector. The study by Iacovone, Maloney, and McKenzie (2019) found that both approaches improved management practices by about 15 percent, but that group-based consulting (of three to eight firms) generated medium-term positive impacts on employment (10 to 12 percent) and sales (8 to 9 percent), but not on productivity, while individual consulting did not improve business performance. Improvement in management practices in the firms participating in group-based consulting seemed to be driven by coordinated experimentation and learning among firms, not by adopting best practices from other firms in the group.

IDEAS FOR FUTURE WORK

In terms of training workers, an issue that has received limited attention in the region is that of the role of the quality of training providers on program impacts (except for Galdo and Chong, 2012, for Peru, and Doerr and Novella, 2020, for Chile). Future evaluations of training programs for workers should study this. The IDB Group has been supporting interventions to increase the involvement of the productive sector in learning. Among them there are interventions that aim to increase the

use of apprenticeships to improve skills at the beginning of working life. Apprenticeships are commonly used in advanced economies to help people acquire skills needed for future jobs (Samek Lodovici et al. 2013), but in Latin America and the Caribbean they are not usually offered in a structured way. The evidence surrounding the impact of apprenticeships in the region is limited (Novella and Perez-Davila 2017), which highlights the importance of rigorously evaluating their implementation in the region. The IDB Group has also been active in supporting projects oriented to modernizing labor intermediation by public employment agencies throughout the region. Artificial intelligence algorithms appear promising in improving labor intermediation; initial evidence from Paraguay (**IDB Project #PR-L1066**) points to positive impacts on the job search process from the inclusion of such algorithms. However, the use of artificial intelligence in labor intermediation is still relatively new globally and in the region, and there are important issues associated with its use, including the potential perpetuation of biases and other ethical considerations that need to be properly considered. More research on the potential of artificial intelligence to improve employment outcomes is needed. Regarding entrepreneur training, both business heuristics training and business mentoring have shown potential in improving skill development, but the body of evidence surrounding these programs, especially related to their scalability, is relatively small. Finally, the COVID-19 crisis highlights the importance of understanding the impacts of digital delivery of services (such as labor intermediation or virtual training), and possible gender differences in access to those services, for which there is no rigorous evidence in the region and very limited evidence globally.

What Works to Improve Lives?

What Works to **IMPROVE ACCESS TO CREDIT**

MSMEs in Latin America and the Caribbean face the second largest financing gap in the world – that is, the difference between the current supply of financing and potential demand that could be addressed by financial institutions – at around US$1 trillion.

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The role of the financial system in a market economy is to improve the allocation of capital by channeling resources towards their most productive uses. By channeling funds to productive firms and helping them grow, credit improves the aggregate level of productivity. Financial frictions that affect the financing of firms are one of the reasons why less developed countries lag more developed ones (Buera, Kaboski, and Shin 2011).

For MSMEs in Latin America and the Caribbean, the financing gap – that is, the difference between the current supply of financing and potential demand that could be addressed by financial institutions – is estimated at around US$1 trillion. This is the second largest financing gap in the world, just behind East Asia and the Pacific (Bruhn et al. 2017).

Despite constituting 99 percent of firms in Latin America and the Caribbean, MSMEs only account for 12 percent of credit, well below the average of 25 percent among member countries of the Organization for Economic Co-operation and Development (OECD). The size of the region's financing gap is related to the level of financial sector development, high informality levels, and the way credit is allocated across firms.

Regarding financial sector development, although there is large heterogeneity across countries, Latin America and the Caribbean compares unfavorably with other emerging markets, especially in terms of the depth and efficiency of financial institutions (Heng et al. 2016).

With respect to credit allocation by financial intermediaries, there are two factors that prevent MSMEs from accessing adequate financing: asymmetric information and economies of scale. It can be costly for financial institutions to distinguish between types of borrowers, as firms asking for financing have better information about their own projects and repayment capacity than financial institutions. This asymmetric information affects MSMEs more than larger firms, and can be particularly important in Latin America and the Caribbean because the larger informal economy increases monitoring costs for financial institutions. In addition, given that on average MSMEs are riskier to lend to than larger firms, financial institutions usually offer them less credit under less favorable conditions, or ask for more collateral (which MSMEs often lack) than what would be required if those financial institutions had more information.

Similarly, economies of scale affect access by MSMEs to credit. Credit screening and evaluation costs are similar even for small loans, making these deals less appealing to lenders. Sometimes the screening costs for micro loans are even higher than the costs for larger loans because lenders need a specialized team that can visit micro firms to carry out the screening. MSMEs are also proportionally more expensive to deal with in the case of a default because the costs associated with liquidation proceedings are not proportional to the credit amount.

EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

To improve access to finance for MSMEs and their performance, the IDB Group has supported government programs and worked directly with financial institutions and funds. These efforts can be classified into three groups: **(i)** operations that channel resources, directly or indirectly, to financial intermediaries and funds; **(ii)** operations that support risk-sharing mechanisms; and **(iii)** operations that support innovative credit screening approaches. Five main lessons have been learned from several evaluations conducted (or sponsored) by the IDB Group to measure the effectiveness of these programs.

(1) Channeling funds to financial intermediaries can improve credit conditions for MSMEs as well as the performance of MSMEs that already have access to credit, but its effect on unbanked MSMEs is less clear.

(2) Guarantee programs can improve MSME performance and access to finance.

(3) Only long-term loans seem to have an impact on investment and employment.

(4) Information-sharing can improve access to credit by reducing asymmetric information and by creating repayment incentives.

(5) Improving access to finance for underserved or unbanked MSMEs requires innovations to solve market failures.

The sections that follow explore each of these five lessons in more detail.

(1) Channeling funds to financial intermediaries can improve credit conditions for MSMEs as well as the performance of MSMEs that already have access to credit, but its effect on unbanked MSMEs is less clear.

The IDB Group provides loans to both public and commercial banks to improve access to finance for MSMEs. Commercial banks receive credit directly from the IDB Group, or indirectly through second-tier banks. This type of intervention is appropriate in situations in which financial intermediaries do not serve MSMEs – or when they do, it is with high interest rates, short tenors, and high collateral – because they lack proper funding for that segment or deem these types of firms too risky.

Eslava, Maffioli, and Meléndez (2014) evaluated the impact of an IDB Group credit program in Colombia (**IDB Project #CO-L1078**), and Bueso-Merriam et al. (2016) evaluated a similar program in the province of San Juan in Argentina (**IDB Project #AR-L1022**). Both operations provided credit to commercial banks through a second-tier institution: Bancoldex in Colombia, and the Central Bank in Argentina. The evaluation in Colombia combined propensity score matching and difference-in-differences methods, relying on rejected and non-participant manufacturing firms to construct the control group. The Argentina evaluation relied on a lagged dependent variable panel data methodology, selecting the control group from rejected and non-participant firms.

The evaluations show that MSMEs in Argentina and Colombia that received credit from these lines increased sales and employment. In the case of Colombia, only long-term financing increased investment. However, the evidence on the effectiveness of these policies in terms of access to credit is less clear. Bueso-Merriam et al. (2016) found that almost all the MSMEs that received credit from the commercial banks participating in the program were already clients of those banks. This finding is not surprising because if banks use creditworthiness assessments based on credit history, firms with no credit history are not deemed creditworthy. Neither of the two programs included in their design specific actions to increase access to finance for firms without a credit history.

Donoso et al. (forthcoming), on the other hand, evaluated a similar program in El Salvador, relying on credit bureau data. In this case, the IDB Group granted a loan to El Banco de Desarrollo de El Salvador (Bandesal) to lend through commercial banks (**IDB Project #ES-L1089**). The evaluation of the program used a combination of matching and difference-in-differences methods, selecting a control group based on future loan recipients prior to their receiving Bandesal-funded loans. The study found that the program increased access to credit on better terms across MSMEs after receipt of the Bandesal-funded loan. In addition, many loan recipients had been unbanked prior to the program. Additional research is needed to better understand why these banks reached these clients.

Other IDB Group programs have aimed to improve MSME access to finance by lending to national development banks that directly lend to MSMEs. These programs were based on the same hypothesis, which is that by improving their source of finance, these banks would improve their credit offerings for MSMEs. The evidence from the evaluations of these programs shows that lending from these banks increased firm performance. De Negri et al. (2011) evaluated the impact of loans to SMEs from the Banco Nacional de Desenvolvimento Econômico e Social (BNDES) in Brazil (**IDB Projects #BR-X1001**, **#BR-L1054**, and **#BR-L1178**). The evaluation used a difference-in-differences approach combined with fixed effects regressions or with a propensity score matching methodology to build the control group from non-participant firms in an administrative registry. The authors found a positive effect on employment.

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Sometimes the screening costs for micro loans are even higher than the costs for larger loans because lenders need a specialized team that can visit micro firms to carry out the screening.

In Mexico, Aparicio et al. (2021) evaluated the effectiveness of loans to rural producers provided by the *Financiera Nacional de Desarrollo Agropecuario, Rural, Forestal y Pesquero* (FND), a national rural development finance institution (**IDB Projects #ME-L1161**, **#ME-L1170**, and **#ME-L1259**). The evaluation used propensity score matching and selected the control group from rejected applicants. The authors found significant positive effects on the value of production and sales per hectare, both for short- and long-term loans.

(2) Guarantee programs can improve MSME performance and access to finance.

The use of collateral is widely applied in MSME lending. When there is a specific asset that guarantees the loan, the lender increases the cost of default for the borrower, thus reducing the moral hazard and guaranteeing some recovery if the default occurs. However, problems associated with the procedures for the liquidation of assets used as collateral, limitations on the types of assets that can be used as collateral, and uncertainty about property rights hinder MSMEs' access to credit. In addition, MSMEs usually lack adequate guarantees. Faced with these problems in financial markets, many countries have implemented guarantee programs to improve access to credit for MSMEs. In Colombia, Arraíz, Meléndez, and Stucchi (2014) evaluated the effect of partial credit guarantees provided by the National Guarantee Fund (NGF) on firm performance, using a difference-in-differences methodology and propensity score matching to select the control group among rejected and non-participant firms. They found that firms that gained access to credit backed by the NGF were able to grow both in terms of output and employment. However, the authors did not find any effect on productivity, wages, or investment.

In Argentina, Giuliodori et al. (2020) also evaluated the effect of guarantees on firm performance, specifically those granted by mutual guarantee firms (**IDB Project #AR3452A-01**). They used a methodology similar to that used in the Colombia evaluation: the control group was selected from administrative data in the same sectors as the treated group. The

evaluation found that guarantees for long-term financing increased both access to finance (without affecting repayment) and employment.

(3) Only long-term loans seem to have an impact on investment and employment.

Some evaluations compared the effect of short- and long-term loans. In Colombia, Eslava, Maffioli, and Meléndez (2014) showed that only long-term loans from Bancoldex had a significant positive effect on investment and employment. They found that although short-term loans improved employment in the short term, only long-term loans had a persistent effect over time. Giuliodori et al. (2020) found a similar result in Argentina for long-term loans: while short-term loans only improved survival probability, long-term loans increased both survival probability and employment.[3] In Mexico, although Aparicio et al. (2021) did not find significant effects of long-term loans on investment decisions, they suggest that this might be driven by the higher proportion of working capital loans in their sample.

(4) Information-sharing can improve access to credit by reducing asymmetric information and by creating repayment incentives.

There is evidence that information-sharing, credit bureaus, and credit scoring can increase credit for SMEs (Berger, Frame, and Miller 2005; Brown, Fazzari, and Peterson 2009; Martinez Peria and Singh 2014). However, not all countries have credit bureaus, and where bureaus do exist the information they provide may be limited for legal and institutional reasons. For example, the average credit bureau in Latin

3_ Although the survival of firms has an effect on employment, the focus of this study was on employment as a consequence of firm growth.

America and the Caribbean complies with only half of international best practices and covers only 41 percent of the adult population (World Bank 2017). Frisancho (2012) evaluated the effect of the decision of one of Peru's leading microfinance institutions to share information on individual outstanding debt records (positive information) as well as group default records (negative information) on access to credit. She used a difference-in-differences methodology, where the comparison group was those individuals less likely to benefit from the change in policy, and found that borrowers without default records and with lower levels of debt were offered credit by other institutions.

(5) Improving access to finance for underserved or unbanked MSMEs requires innovations to solve market failures.

As mentioned above, MSMEs can be credit-constrained because of asymmetric information. Solving this problem requires providing lenders with additional information apart from credit histories, where they exist. Alternative credit scoring interventions aim to directly ease the asymmetric information problem by generating additional information about the probability of repayment. The main issue with standard credit scoring mechanisms is that they are based on repayment information, requiring loan applicants to have a credit history. This is clearly an obstacle for applicants with no credit history. Arraiz et al. (2018) evaluated the use of psychometrics for SME lending by a large bank in Peru (**IDB Project #PE-L1136**). A psychometric tool (a questionnaire including questions relating to individual attitudes, beliefs, integrity, and performance, among other things) was used to evaluate applicants, and those who achieved a score higher than a specified threshold were offered a loan. Using a regression discontinuity design and credit bureau data, Arraiz et al. (2018) found that the tool increased SME loan use 54 percentage points for applicants without a credit history, without leading to worse repayment behavior. For applicants with a credit history, the tool proved gratuitous, as it did not increase SME loan use.

IDEAS FOR FUTURE WORK

The Fintech industry (i.e., institutions – many times non-financial – offering financial products and services using technological tools) in Latin America and the Caribbean is growing, and an important part of it is targeting underserved or unbanked MSMEs (IDB 2018). Therefore, it has the potential to improve MSMEs' access to finance. Fintech companies are disrupting the status quo by creating innovative scoring systems using algorithms that can analyze credit risk and make decisions about an applicant's solvency. This can help level the playing field in terms of access to loans for MSMEs with little or no credit history. Despite the growth of the Fintech industry in the region, however, there are still few impact evaluations of the effectiveness of these new approaches. One of the few is Arraiz et al. (2018), discussed above, which provides evidence on an alternative credit scoring mechanism developed by a Fintech company and applied by a large bank in Peru. This is an area where further research is needed, and where the IDB Group is already conducting evaluations in Argentina and Colombia.

What Works to Improve Lives?

What Works to **PROMOTE ENTREPRENEURSHIP WITH HIGH-GROWTH POTENTIAL**

Latin America and the Caribbean is often referred to as an entrepreneurial region. But the term "entrepreneurship" can allude to several opposite realities. While the region is vastly populated with necessity entrepreneurs, gazelles are still scarce (Lederman et al. 2014).

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Latin America and the Caribbean is often referred to as an entrepreneurial region. But the term "entrepreneurship" can allude to several opposite realities. On one hand, there are so-called "necessity" entrepreneurs who respond to the need to create jobs through self-employment, most often to escape unemployment, though sometimes to opt out of unpromising dependent labor path (Lederman et al. 2014). On the other hand, there are dynamic entrepreneurs, also known as "gazelles," who create new products, processes, and business models to bring to the economy and who have high growth potential (Birch 1989). While the region is vastly populated with necessity entrepreneurs, gazelles are still scarce (Lederman et al. 2014). Productive development policies promoting dynamic entrepreneurial activity target this very specific niche of business initiatives. Some of the market failures in the region that are preventing the emergence and development of these high-growth-potential "gazelle" entrepreneurs are found at three levels:

(1) At the level of the entrepreneur:

- For existing gazelle prospects, asymmetries of information can amplify the risk perception in the credit and capital markets to provide early-stage funding given the innovative aspect of gazelle businesses and their unproven business model (Brown et al. 2009).

- While good gazelle prospects can sometimes find monetary resources in the local or international venture capital markets, they still need nonmonetary support to overcome technical and commercial risks, such as access to entrepreneurship ecosystems (Gonzalez-Uribe and Leatherbee 2018). However, the existing private supply of incubation and acceleration services in the region is still incipient and not yet profitable to operate at current scales without public support (Gonzalez-Uribe and Reyes, 2021).

(2) At the level of the ecosystem in which the entrepreneur operates:

- Local ecosystems for dynamic entrepreneurship are still developing and several still have incomplete markets that do not incentivize the supply of a strong stream of investable projects. In the region, few universities have strong and active strategies for technical transfer to the private sector; very few corporations have venture capital funds to attract high-profile entrepreneurs; and very few venture capital funds provide private high-risk funding. These shortcomings are important, since evidence has shown that entrepreneurs tend to concentrate geographically, in part because of the social environment. Individuals are influenced by what others have chosen, especially when facing ambiguous situations (Kreft and Sobel 2005; Minniti 2005).

- Relevant actors (suppliers of services, investors, institutional clients) coordinate with their closest clients or suppliers but not necessarily with other relevant actors in the ecosystem, so the gains from articulation and cooperation are lost. The lack of regulatory public goods also strongly affects this type of entrepreneurial activity, including the lack of modern bankruptcy and insolvency procedures, poor intellectual property rights protection, and obsolete public procurement processes (Estrin, Korosteleva, and Mickiewicz 2009; Klapper, Laeven, and Rajan 2006).

(3) At the level of government support:

- In many cases, public and private programs rely on costly selection mechanisms based on soft traits rather than on other stronger predictors of success (McKenzie and Sansone 2019). This may lead to poor selection of prospective entrepreneurs who manage to apply for public support. Additionally, sometimes the design of these programs assumes that the supply of dynamic entrepreneurs is sufficient even when that might not be the case given the realities and needs of entrepreneurs in the region.

EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

Two main lessons have emerged from the impact evaluations of dynamic entrepreneurship programs conducted throughout the region:

(1) Entrepreneurs receiving public support have better chances of surviving and growing.

(2) Ineffective selection mechanisms may reduce the success of entrepreneurship programs, and these mechanisms should factor in more proven predictors of success.

The sections that follow explore each of these two lessons in more detail.

(1) Entrepreneurs receiving public support can increase their chances of surviving and growing.

The public response to overcome market failures at the level of entrepreneurs has been moderately successful. At their most basic configuration, start-up programs aim to overcome the two biggest constraints that start-ups face: access to finance, and access to incubation and acceleration services. Depending on the stage of development of the start-up, traditional financial support includes subsidized seed capital, venture investment in equity, and soft loans. Traditional support for services usually consists of vouchers to buy consulting services (legal, operational, technical, etc.) or incubation and acceleration services (workspace, mentoring, networking with investors and corporations, etc.) from specialized actors. Often, both types of support are provided together to maximize the complementarity between

financial and technical assistance, which has proven to be impactful for recipient start-ups.

For example, using a difference-in-differences methodology and propensity score matching, Bonilla and Cancino (2011) evaluated the Seed Capital Program of Chile's Technical Cooperation Services (*Servicio de Cooperación Técnica* - SERCOTEC), which provided financing to entrepreneurs running small firms between 2006 and 2008, conditional on receiving training. The evaluation found a positive and significant effect on the number of workers hired, but no impact on sales or on the probability of raising capital from a private source (either bank debt, funding from family or friends, or angel investment). Similarly, Navarro (2018) evaluated the entrepreneurship program implemented by Chile's Production Development Corporation (*Corporación de Fomento de la Producción* - CORFO) and found that its beneficiaries had a higher probability of starting to sell and that new firms had a higher probability of significant growth in sales and survival rates. However, the authors recognize that the data used in the study did not make it possible to fully control for potential selection biases, and thus the results may overestimate the impact of the program.

Using a propensity score matching methodology, Goñi Pacchioni and Reyes (2019) also found, on average, a positive impact on several outcomes (survival, employment, and sales) in the first five cohorts (2014–2018) of StartUp Peru, a program simultaneously providing seed capital and incubation services to innovation-oriented entrepreneurs. However, it seems that the impacts were not as large as expected due to the selection of beneficiaries. Box 2 illustrates how choosing the right candidate is key for programs such as StartUp Peru to be successful.

Box 2. Chazki: A Start-up that Has Become a Market Leader

Chasquis were the messengers of the Inca empire who would travel great distances on foot to deliver messages and gifts. But today's chasquis make their deliveries on motorbikes in just a few hours in Peru, Mexico, Argentina, and Chile. And Amazon is their No.1 client.

Chazki is a tech start-up based in Lima, Peru that specializes in logistics. In a country with limited access to capital for entrepreneurs, the company co-founded by entrepreneur Gonzalo Begazo owes part of its success to StartUp Peru,[a] a government initiative launched in 2014 to foster innovation and productivity.

Chazki had been operating for three years when, with his vision of operating beyond Peru's borders, Begazo was awarded a grant from StartUp Peru in 2018 for the equivalent of US$182,000 by today's exchange rate. It was StartUp Peru's largest grant that year.

"Many Peruvians are looking to solve problems in their own backyard, instead of thinking about building something that crosses borders," explains Begazo, who has worked at Google and other Silicon Valley giants. "Startup Peru was really the catalyst for Chazki's internationalization."

Thanks to artificial intelligence, Chazki is developing tools to help with geolocation, particularly as 30 percent of its deliveries are in areas with difficult access. Online purchases are on the rise, and particularly increased during the COVID-19 pandemic. And Latin America's working poor, many of whom own cellphones, are potential customers.

The backing from StartUp Peru came as Chazki was growing fast and in urgent need of funding. The public investment also played a role into the company's decision to set-up in other places such as Argentina. Begazo is grateful to StartUp and his investors, and confident in his company's impact on the region.

Not all StartUp Peru's beneficiaries have become market leaders like Chazki, and selecting the right candidates to support has at times been challenging, as discussed in an IDB Group study of the program's effectiveness (Goñi Pacchioni and Reyes 2019a). In the case of Chazki, Begazo believes it was his endeavor to solve a very "Latin American" problem – logistics – that has made his company successful.

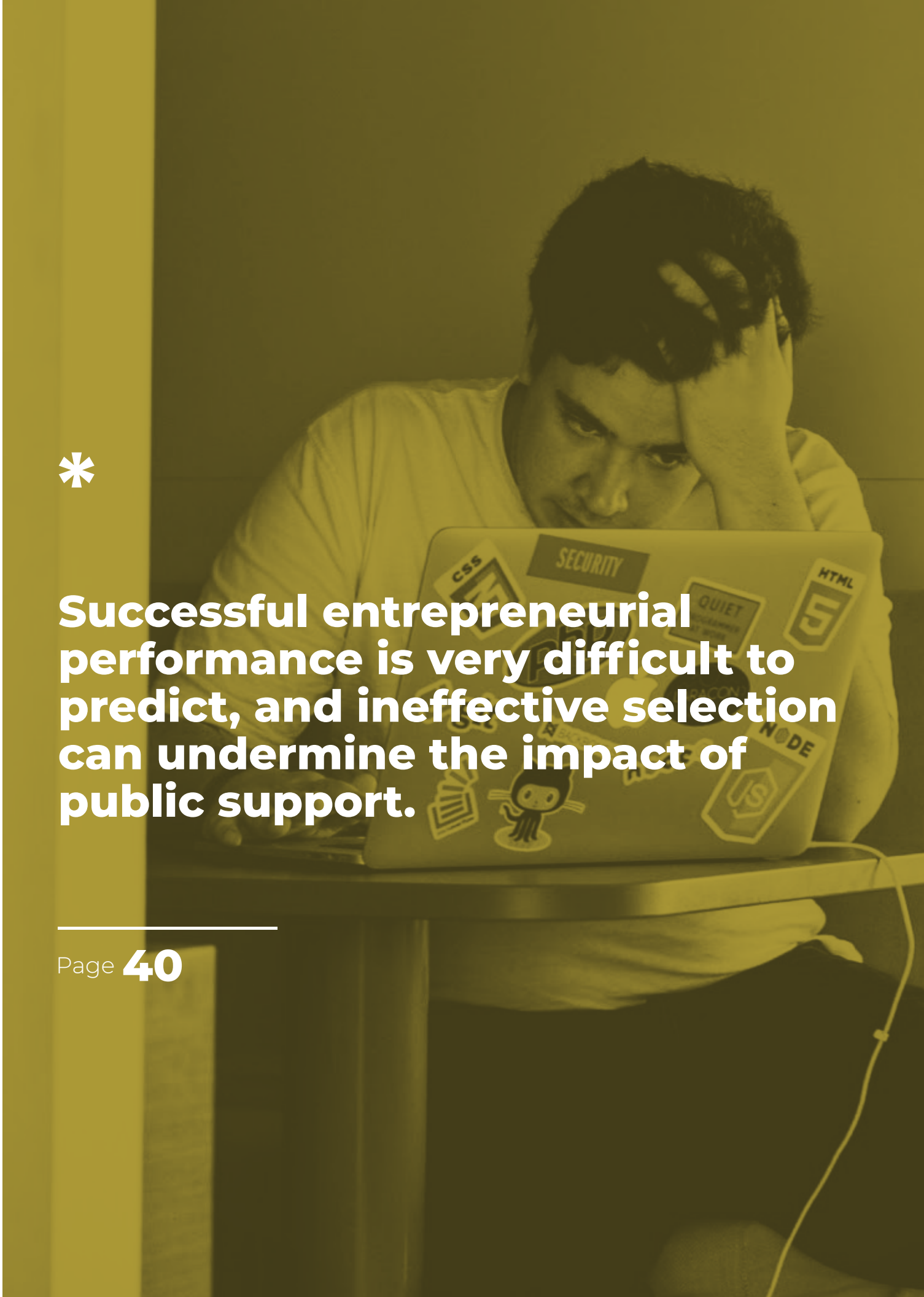
"Socio-economic backgrounds or zip codes are no barrier to us," he concludes. "We are making Amazon Prime accessible to all Latin Americans."

[a] See **https://startup.proinnovate.gob.pe/**.

(2) Ineffective selection mechanisms may reduce the success of entrepreneurship programs, and these mechanisms should factor in more proven predictors of success.

Successful entrepreneurial performance is very difficult to predict, and ineffective selection can undermine the impact of public support. Less-than-optimal filtering of beneficiaries will always undermine the effectiveness of any public intervention, and in the case of dynamic entrepreneurship programs, poor selection mechanisms may result in the inclusion of either necessity entrepreneurs or projects with big aspirations but weak fundamentals (e.g., in terms of founding members, viable business ideas, etc.).

Bonilla and Cancino (2011) mention that although the SERCOTEC program in Chile was intended to be a productive initiative for entrepreneurs, it ended up attracting small microfirms (probably necessity firms). This was mainly because **(i)** the eligibility criteria restricted participation to



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Successful entrepreneurial performance is very difficult to predict, and ineffective selection can undermine the impact of public support.

micro and small firms that had operated for less than one year, and **(ii)** there were already public programs serving small firms that provided better initiatives. Navarro (2018) studied the effect of a change in CORFO's program in Chile in 2011, when the compensation provided to sponsors changed from a fixed fee to a variable fee based on the performance of the selected entrepreneurs. The study found that the change did not impact the probability of creating a business but did generate growth in sales and survival. This result suggests that the change in the payment scheme incentivized sponsors to select entrepreneurs with higher expected performance.

Supporting inexperienced entrepreneurs with weak entrepreneurial teams and poor projects is unlikely to be effective even with untapped financial resources and the best acceleration services. Recent evidence in the region indicates that adverse selection undermines the effectiveness of start-up programs. Goñi Pacchioni and Reyes (2019) suggest that the average effect of StartUp Peru was lower than expected because of the selection of a group of entrepreneurs with characteristics that were predictive of a low probability of success and the exclusion of entrepreneurs with a higher probability of success. The successes as well as the challenges faced by this program, which is supported by the IDB Group (**IDB Project #PE-L1162**), has become an example for other projects that aim to foster innovative entrepreneurship in Latin America and the Caribbean (Box 3).

To select suitable prospects and determine which candidates have the highest potential to grow, public start-up programs usually follow a two-stage selection process. The first stage is often based on a score after an evaluation of certain specific criteria chosen by the program (e.g., observable characteristics of the entrepreneur, the founding team, and the project). In the second stage, a panel of experts evaluates the candidates who passed the first stage based on an "elevator pitch" that briefly describes the project. For StartUp Peru, Goñi Pacchioni and Reyes (2019) found that observable variables of the lead entrepreneur, the team, and the project were related to future success. They argue that programs with a sequential selection process in which assignment is determined by a subjective pitch end up choosing based on the soft skills of those who make the pitch. Paradoxically, observables of their business ideas,

their actual firms, or the entrepreneurs themselves are disregarded as predictors of success (e.g., gender, age, ability, and business sector). The authors show that, based on those characteristics, candidates are sorted at random in the overall selection process.

Box 3. StartUp Peru: The Challenge to Keep an Entrepreneurship Program Dynamic

Since 2014, StartUp Peru has promoted the development of the ecosystem of innovative entrepreneurship in Peru in multiple ways by providing support to the ecosystem's institutional actors – such as incubators, accelerators, and venture capital funds – and more directly through seed capital and technical assistance to dynamic entrepreneurs. Goñi Pacchioni and Reyes (2019) evaluated the impact of direct support to the entrepreneurs for the first five cohorts of beneficiaries, and their findings had immediate repercussions on the redesign of the beneficiary selection process in subsequent cohorts.

One of the main findings was that while impactful, the program could have been even more effective had there been better selection of candidates. Since then, the sixth generation of the program, Innovate Peru, has adjusted the selection process using the lessons stemming from the evaluation. First, the information about traditional predictors of success is now used through a one-page summary of how the characteristics of the candidates compare to those average characteristics of past successful beneficiaries. The summary is given to the evaluators as an additional input to complement the second stage of the selection process. Second, the five-minute pitch to the evaluation panel during the second stage was replaced by a "speed dating" mechanism in which each of the three evaluators of the panel has independent 15-minute interviews with the candidates followed by a deliberation by the panel to combine its insights on the candidate.

As a follow up to the Goñi Pacchioni and Reyes (2019) study, further research to improve the program has started in coordination with Innovate Peru. The research aims to examine the role and effect of evaluators on the efficacy of selection and the influence of the program on more aggregate levels (for instance, on the development of the ecosystem). Lessons from this experience have also influenced the design of other start-up programs in the region, such as a program in Jamaica (**IDB Project #JA-L1085**).

Moreover, Gonzalez-Uribe and Reyes (2021) show that an acceleration program in Colombia that provided nonmonetary benefits (support to firms to improve business capabilities) did not have an impact on low- and average-quality projects but doubled the sales of high-potential entrepreneurs. Furthermore, poor selection could end up having counteractive effects. Goñi Pacchioni and Reyes (2019) estimated that about 50 percent of the non-beneficiaries of StartUp Peru with low probability of success ended up working as formal employees, while almost 60 percent of the beneficiaries rated with low probability of success continued as entrepreneurs with the same project. This implies that ineffective selection mechanisms could trigger further suboptimal decisions regarding labor outcomes, particularly in the pool of potential entrepreneurs.

The role of the judges in the second stage of the selection process (panel interview) has been studied in the region as well. For the acceleration program in Colombia, Gonzalez-Uribe and Reyes (2021) found that, although average scores did not predict success, scores that controlled for judges' leniency did. As a result, selection mechanisms should take into account the effect that judges have on the selection process and include tools in the design that help overcome the potential biases introduced by specific judges. This can be done by, for instance, including more than one judge in the selection process and rotating which judges are included on the panel.

The results of these studies contribute to the limited but growing literature on how to select firms that have a higher probability of succeeding. Most of the existing literature looks at start-ups and venture-backed firms in developed countries, and while some of these studies find that judges' scores have some predictive power (Astebro and Elhedhli 2006; Scott et al. 2015), other also point to the immense difficulty of identifying who will be more successful (Kerr et al. 2014; Nanda 2016). There has been much less evidence of this issue coming from developing countries. Fafchamps and Woodruff (2017) compare the performance of judges' evaluations to survey-based measures and find that both have some (independent) predictive power among business plan contestants in the case of Ghana. In contrast, McKenzie and Sansone (2019) find that business plan scores from experts, panel scores, and modern machine learning methods are not that effective in predicting future success in the case of a business plan competition in Nigeria. However, they find that some key characteristics of entrepreneurs such as gender, age, ability, and business sector do have some predictive power for future outcomes.

IDEAS FOR FUTURE WORK

Successful public interventions targeting dynamic entrepreneurs should try to move beyond the individual impact on entrepreneurs. When talking about the effectiveness of entrepreneurship programs, most of the interventions look at the impact of seed capital or services on entrepreneurs' performance. However, public programs that support dynamic entrepreneurship, especially in young ecosystems, also aim to improve and develop the ecosystem in which the entrepreneurs will develop. Initial evidence shows that this is the case, but more rigorous evidence is needed. Goñi Pacchioni and Reyes (forthcoming) studied the role of StartUp Peru as a catalyst and articulator of the ecosystem in Lima. Using social network analysis, they found that the program had an influence on convening, articulating, and supporting several key actors of the ecosystem. However, providing support to selected entrepreneurs

is not enough if the local ecosystem does not provide a hospitable and helpful environment in which entrepreneurs can grow. Therefore, when looking at the effect of public entrepreneurship programs, one should also pay attention to the role of these programs at more aggregate levels. Additionally, there are plenty of questions related to what works in dynamic entrepreneurship policies that still need to be addressed. There is no conclusive evidence about what type of direct support to entrepreneurs is more effective – financial support, nonmonetary services, or a combination of both. Progressive growth of local ecosystems has also convened more private investors, redefining the need for public intervention in the financing space. For example, SoftBank has launched a US$5 billion fund that will invest in technology start-ups across Latin America. Additionally, some public programs have started to invest in the equity of start-ups rather than just injecting subsidized seed capital.

Likewise, the evolution of ecosystems is also transforming the types of services that entrepreneurs need. Some programs are moving toward vertical initiatives that promote mission-oriented research and innovation to solve problems and that require sector-specific services. For example, in 2016, Chile implemented a strategy for the solar energy sector to foster innovation, develop technologies and skills, and reduce carbon emissions, with a roadmap toward 2025. CORFO supported projects that developed technologies to produce energy from high solar irradiation areas (i.e., the Atacama Desert), new storage and distribution solutions for solar energy, a solar oven for copper production, and solar technologies for mobility (Mazzucato and Penna 2020). Other initiatives are switching to open innovation programs that focus more on articulation services to connect big institutional demanders of innovative specialized solutions (corporations or public agencies) with start-ups working on solutions with highly specialized technological content.

It is important to consider that the future design of entrepreneurship programs should not be limited to the traditional combination of seed capital and incubation and acceleration services. The IDB Group is working with start-up programs partially financed with IDB Group loans in Jamaica (**IDB Project #JA-L1085**), Peru (IDB Project #PE-L1163), and Uruguay (**IDB Project #UR-L1142**) to generate more evidence surrounding the optimal design for entrepreneurship programs in the region. Furthermore, it is

important to consider that the new reality brought on by the COVID-19 pandemic is currently affecting start-up investment. On the one hand, organizations that support start-ups are facing challenges to keep up with their activities during the pandemic, either because of a lack of funds or technical limitations. The IDB Group recently surveyed 429 organizations involved with entrepreneurial ecosystems in 18 Latin American countries and found that two out of three organizations said they have significantly reduced or stopped their work (Kantis and Angelleli 2020). On the other hand, the pandemic crisis has brought new opportunities to entrepreneurs in sectors with increasing demands in activities such as telework, telemedicine, virtual education, and e-commerce.

What Works to Improve Lives?

What Works to FOSTER INNOVATION AND TECHNOLOGY EXTENSION

Research and Development (R&D) intensity in Latin America and the Caribbean is systematically lower than in developed countries.

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Since the pioneering work of Solow (1957), innovation has been credited with explaining a substantial share of productivity growth. In fact, more recent evidence for the United States shows that investments in R&D – which is just one component of total investments in innovation – made up 40 percent of productivity growth during the postwar era (Reikard 2011). Innovation is broadly understood as the successful introduction of a new or significantly improved product or production process, or the adoption of new managerial practices (OECD 1993).

R&D intensity in Latin America and the Caribbean is systematically lower than in developed countries. While in developed countries firms account for more than 60 percent of national investment in R&D, this figure is less than 35 percent in Latin America and the Caribbean (RICYT 2014). As a result, since the early 1990s, a new generation of public programs to encourage business innovation has spread throughout the region. Despite these efforts, however, innovation gaps remain.

The IDB Group has invested in alternative interventions to strengthen the region's innovation systems by addressing the different market failures that hinder business investment in innovation and technology adoption. The IDB Group interventions have followed a systemic approach by simultaneously supporting the supply of knowledge (by investing in programs that support scientific research, research labs, and advanced human capital development) and encouraging the demand for knowledge (by investing in business innovation and technology extension).[4] This section focuses on interventions on the demand side and on those that promote interaction between supply and demand. Broadly speaking, the rationale for public policy in this field considers spillovers and the "public good" nature of knowledge, as well as asymmetric information and uncertainty.

Innovation results from deliberate business investments in knowledge accumulation.[5] Since the publication of seminal works by Nelson (1959) and Arrow (1962), knowledge has been regarded as a nonrival and

4_ Examples of impact evaluations of IDB Group programs that enhance scientific research are Chudnovsky et al. (2008) and Benavente et al. (2012).
5_ Investments in knowledge accumulation can take different forms such as R&D, training, acquisition of know-how, knowledge embodied in machinery and equipment, etc.

nonexcludable good. This may create a wedge between private and social returns and a disincentive against private investment in knowledge generation. The more generic the knowledge being generated and the more collaborative the knowledge-generation process, the more spillovers can be expected. That is why collaboration among businesses, universities, and research centers is a key focus of IDB Group interventions in this field.

In addition to collaboration among private sector actors, governments play a key role in creating institutional frameworks that promote innovation, as shown in Box 4 for the case of Uruguay.

Box 4. Revamping the Innovation Institutional Framework in Uruguay

In 2006, the new government of Uruguay decided to revamp the institutional framework of the country's innovation system. With support from the IDB Group (IDB Projects #UR-L1030, #UR-L1071, #UR-L1096, #UR-L1142, and #UR-L1156) and other multilateral organizations, one of the most important decisions was to establish the National Research and Innovation Agency (*Agencia Nacional de Investigación e Innovación* - ANII).

The ANII was a first-order institutional innovation because it introduced a culture of competition in the process of allocating public resources among innovation actors. To guarantee the agility and flexibility required to operate within a context of rapid technological change, the ANII was established as an agency operating under private sector law. From the start, it focused on ex post evaluation rather than on heavy ex ante control systems, and institutional learning was of paramount importance. The agency created a strong and stable monitoring and impact evaluation unit. To this end, the main challenge that the ANII faced was setting up a data collection system that, based on registered data, could generate a permanent flow of information to carry out impact evaluations on an ongoing basis.

With IDB Group support (**IDB Project #UR-L1030**), a data system was designed in collaboration with Uruguay's National Statistics Institute (*Instituto Nacional de Estadística* - INE). The regular samples that the INE collects in its enterprise surveys were augmented to include data collection from ANII's applicants (both beneficiaries and non-beneficiaries). To complement this, all the applicants, when submitting their proposals, were required to fill out the same questionnaire that INE would use later in the national surveys. This process has generated continuous and very high-quality data that has been used for impact evaluations since the ANII started.[a]

The ANII has been supported by five IDB Group loans, and regular impact evaluations of its business and entrepreneurship innovation support interventions have been carried out every two years. Stability in the impact evaluation agenda has allowed the agency to continuously redesign and adapt its offering of support programs to the needs of Uruguayan firms. For example, several impact evaluations showed that most of the impact of ANII programs on business innovation investment was due to an increase of investment by already-investing firms, with very little evidence on the extensive margin. To address this, new interventions were deployed to specifically help non-innovating firms build capacity to start their innovation journey. Also, a stronger emphasis was given to promoting new innovative start-ups. Additionally, a strong impact evaluation team was developed, making the agency a focal point of impact evaluation technical assistance for other productive development agencies in Uruguay and the region. The ANII's evaluation unit also provides support to Uruguay's national development and export promotion agencies. In addition, the ANII leads the impact evaluation chapter of the Regional Network of Innovation Agencies (*Red Latinoamericana de Agencias de Innovación* - RELAI), providing technical support and training to other agencies in the region.

[a] For details of the impact evaluations, see ANII's website at **www.anii.org.uy/institucional/documentos-de-interes/4/informes-de-evaluacion/**

Innovation projects are distinguished from ordinary investments in several ways (Hall and Lerner 2010). The returns to innovation investments are more uncertain, involve longer gestation lags, and normally include a large proportion of intangible assets that have very limited use as collateral. Although the problem of asymmetric information in investment decisions is always present whenever the investor and financier are different entities, this problem may be worse in the case of knowledge investments. This creates a wedge between the rate of return required by an innovator investing his or her own funds and that required by external investors. So even when spillovers are absent, lack of financing can lead to a business investment in innovation that is lower from a private point of view than what would be optimal from a societal point of view. Regarding the adoption of existing technologies, there may also be insufficient knowledge about available technologies. In a world of imperfect information, policy interventions would therefore focus on providing information, such as extension services, which inform industry about recent technological advances.

EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

Three main lessons have emerged from several impact evaluations the IDB Group has conducted in the region to test a variety of solutions to the issues presented above.

(1) R&D matching grants can correct market failures, but the intervention's design is key.

(2) Promoting innovation-oriented credit programs might be an effective approach to increasing private investment.

(3) Technology extension programs can close knowledge gaps of SMEs.

The sections that follow explore each of these three lessons in more detail.

(1) R&D matching grants can correct market failures, but the intervention's design is key.

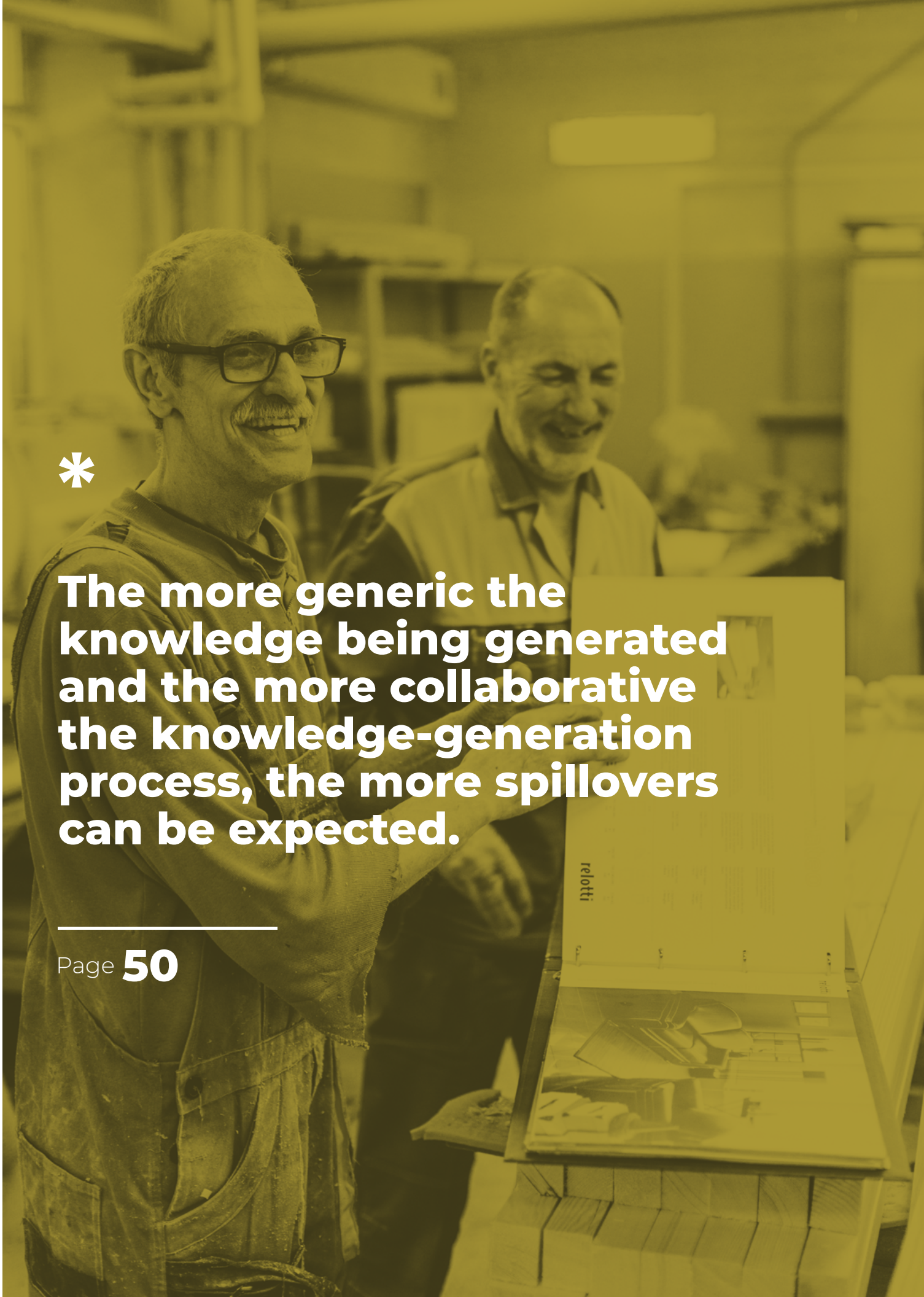
R&D matching grants are subsidies to firms, conditioned on them investing, to incentivize R&D investments. Their main rationale is to promote knowledge spillovers. The R&D undertaken by one firm can (positively) affect the performance of other firms operating in the same or in other industries, as the investing firm cannot exclude those firms from using the generated knowledge (without effective patents or other protection institutions). This non-excludability of knowledge generates disincentives for private investment in knowledge production, due to the threat of free riding of new knowledge by other firms. Although knowledge spillovers are the main rationale for public subsidies to support business R&D, most previous impact evaluations of innovation programs have focused on their impact on the R&D investments and productivity of direct beneficiaries (Cerulli 2010; Cerulli, Gabrile, and Poti 2016; Crespi, Maffioli, and Rastelletti 2014; Doraszelski and Jaumandreu 2013; Figal Garone and Maffioli 2016; Hall and Lerner 2010; Hall and Maffioli 2008; Zúñiga-Vicente et al. 2014). Yet this approach is not informative enough to assess whether such subsidies are justified. For example, a subsidy would not be justified if all the benefits from the R&D investment were concentrated in one firm. In such cases, a traditional impact evaluation focused on direct beneficiaries would indicate that the intervention increased investment and productivity, even if it failed to generate knowledge spillovers.

There are three main channels through which these spillovers might happen: labor mobility, geographic distance, and value chain linkages. Castillo et al. (2019) studied the first channel of spillovers for the case of R&D matching grants provided by the *Fondo Tecnológico Argentino* (FONTAR) in Argentina, a program supported by the IDB Group (**IDB Project #AR-**

L1073). The study used administrative data on all formal firms in Argentina and their employees, plus the FONTAR-supported firms, which allowed for following three groups over time: **(1)** firms generating knowledge (i.e., the firms that participated in the program and invested in innovation); **(2)** the employees of those firms; and **(3)** the firms that hired employees from the original investors in innovation. The study used a fixed-effects (at the firm level) model to control for selection bias. The results show that FONTAR helped participating firms improve their performance and generate valuable productive knowledge, which spilled over to workers who directly participated in the program and was diffused through labor mobility to other firms. Firms that participated in the FONTAR program also increased their probability of surviving in the long run by 3.2 percent; improved their probability of exporting by 5.8 percent; and, in the case of firms that were already exporting, increased the value of their exports by 34.5 percent. In addition, the firms increased their numbers of employees by 28.4 percent. The program also had a clear positive effect on average wages, which increased 1.2 percent per year over a period of 15 years. Higher wages were found not only for FONTAR workers who stayed at the firm after participating in the program, but also for workers who moved to other firms. These findings suggest that knowledge acquired through exposure to innovation was embedded in human capital (with market value) that might be transferred to other firms, and that spillovers were partially internalized by the labor market. The average annual effects on wages for low- and high-skilled workers were almost 2 percent and 3 percent, respectively, compared to the control groups.

Finally, the analysis found that companies that hired workers from FONTAR-supported firms significantly improved their performance. They increased their probability of survival, probability of exporting, value of exports, and average wages. However, the magnitude of these effects was generally lower than the magnitude of the effects on the direct beneficiaries. The findings suggest these results were due to an increase in the marginal productivity of the receiving firm rather than changes in the composition of skills.

Although knowledge spillovers are the main justification for R&D matching grants, different types of R&D projects may vary in their



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The more generic the knowledge being generated and the more collaborative the knowledge-generation process, the more spillovers can be expected.

potential to generate spillovers. For instance, firms conducting intramural R&D – that is, R&D activities that are developed within the firm – may find it easier to protect the knowledge generated internally. By contrast, knowledge generated via extramural R&D – that is, R&D activities that are undertaken in collaboration with (or by) an external partner such as a firm, consortium, university, or another institute – may be more generic and/or easier to codify, and its benefits more difficult to appropriate. Thus, extramural R&D could be expected to produce more knowledge spillovers.

To explore this, Crespi et al. (2020) evaluated the long-term direct and indirect (spillover) effects of programs supported by Chile's National Productivity and Technological Development Fund (*Fondo Nacional de Desarrollo Tecnológico y Productivo* - FONTEC) and Science and Technology Development Fund (*Fondo de Fomento al Desarrollo Científico y Tecnológico* - FONDEF), both programs once supported by the IDB Group. Rather than focusing only on direct beneficiaries, the authors assessed the extent to which R&D matching grants had also indirectly affected untreated firms, using an indicator of spatial and technological proximity between treated and untreated firms. While FONTEC supports intramural R&D, FONDEF finances extramural R&D carried out in collaboration with research institutes. The study relied on firm fixed-effects models, using administrative and survey data. The findings show that R&D matching grants in Chile did generate spillover effects. In fact, when considering both programs together, Crespi et al. (2020) found that policy intervention increased the productivity of both treated firms (direct beneficiaries) and untreated firms located in the same region and sector (indirect beneficiaries), with similar direct effects when looking at each program separately. However, the results suggest that spillover effects were contingent on program design: while both programs increased productivity for direct beneficiaries, only FONDEF-funded projects (i.e., extramural R&D) generated positive spillover effects.

These findings have three policy implications. First, the results provide evidence on the most important justification of innovation policy: firms that invest in innovation do not reap the full benefits of their investment, and matching grants can be a useful tool to promote knowledge creation and increase productivity. Second, because externalities in the form of

spillover effects are often overlooked in ex ante cost-benefit analyses of this kind of instrument, decisions about the size of such interventions could be undersized or underfunded. Third, innovation policy designs that encourage research collaboration among different actors, particularly firms and universities or technological institutes, should probably be preferred over those that simply subsidize intramural R&D.

(2) Promoting innovation-oriented credit programs might be an effective approach to increase private investment in innovation.

Lack of proper financing can be a significant problem that hinders private investment in innovation. Over time, several public programs have been deployed in the region to provide either dedicated credit lines for firm-level innovation or guarantees.

Binelli and Maffioli (2007) carried out one of the most comprehensive assessments of the impact of a credit program on innovation. More specifically, they evaluated the impact of the innovation credit line financed by FONTAR in Argentina on firms' decision to invest in innovation (**IDB Project #AR-L1073**). Additionally, they compared the impact of innovation credit lines with that of subsidies, both direct and indirect (tax credit). FONTAR's main credit intervention provided long-term financing to firms willing to invest in a technological modernization project (with the aim of adopting an already existing technology). A helpful feature of the Binelli and Maffioli paper is that they explicitly run a horse race between credit financing and subsidies. This multi-treatment setting is a quite novel aspect of the impact evaluation that differentiates it from others carried out internationally regarding innovation support programs.

The estimation strategy was based on a difference-in-differences, firm-level investment model in which the main dependent variable was the (log) total private investment in innovation. In some estimations, instrumental variables were also used to control for the potential endogeneity of the treatment. Results suggest that a 1 percent increase in the amount

financed through the program yielded a 0.15 percent increase in privately financed R&D. To investigate how this impact compared with subsidies (both direct and indirect), additional treatment variables were included. The study found similar impacts. These results are consistent with other evaluations of both subsidy and credit programs that support innovation but that do not make use of a multi-treatment setting. Zúñiga-Vicente et al. (2014) conducted one of the most comprehensive reviews of the impact of R&D subsidies on private R&D investments around the world. They documented the results of 76 studies carried out at the firm level since the early 1960s, most of which were published in the 2000s. Although the studies are not fully comparable, a general pattern clearly emerges: in 60 percent of the cases, the crowding-in hypothesis cannot be ruled out. The rest of the studies find either crowding out or non-significant effects (20 percent each). More recently, Dimos and Pugh (2016) provide a meta-regression analysis of micro-level studies published since 2000 on the impact of public subsidies for R&D on either input or output R&D. Their findings reject crowding-out of private investment by public subsidy. Regarding the impact of credit programs on innovation investments, although the evidence is scarcer, several studies have found a positive impact on private investment, such as in the cases of the Brazilian ADTN and Innova Crédito programs (De Negri et al. 2006; Kannebley et. al 2013).

In summary, when the aim of the policy is only to increase firm-level investment in innovation (regardless of spillover effects), both credit-based and noncredit-based interventions provide similar results (crowding-in effects). In this scenario, it is better to use credit-based interventions because they are reimbursable mechanisms that reduce the fiscal costs of the policy, enhance the sustainability of the implementing organizations, and reduce the likelihood of crowding-out effects.

(3) Technology extension programs may be able to contribute to closing knowledge gaps of SMEs.

Technology extension programs provide firms with assistance on technical matters, best practices, and other areas. Castillo et al. (2014, 2016) evaluated the SME Business Restructuring Program (*Programa de Apoyo a la Reestructuración Empresarial* - PRE) and the Credit Access and Competitiveness Program (*Programa de Acceso al Crédito y Competitividad para Micro, Pequeñas y Medianas Empresas (MIPyME)* - PACC) in Argentina, both supported by the IDB Group (**IDB Project #AR-L1033**). The main objective of these programs is to provide nonreimbursable vouchers to cofinance technical assistance projects to develop the capacity and competitiveness of SMEs. The focus is on quality certification, marketing, and organizational change services. Using panel data, the evaluation found a positive and significant impact of the programs on employment (5 to 18 percent), export probability (1.4 to 2.5 percent), exports (6.1 to 9.3 percent), survival (1.3 to 1.6 percent), and productivity (0.6 to 1.8 percent). In the case of the PACC, the results also suggest that the effects varied depending on the type of technical assistance received. While all the services had positive and significant effects on survival and employment, only quality certification services showed consistent positive impacts on exports and average wages. An additional result was that program additionality was strongly related to the initial assistance provided by the PACC, but not with future participation in the program (in the case of firms with repeated participation). This finding is consistent with the hypothesis that the program helped solve information problems between technical assistance suppliers and SMEs. This result would suggest that the effort of these programs should focus on the extensive margin (that is, on enrolling new firms).

IDEAS FOR FUTURE WORK

The IDB Group has leveraged its operations and technical cooperation programs in the innovation and technology extension field to produce rigorous knowledge in terms of which policy instruments work best, how successful interventions work, and whether policies effectively deal with the market failures that warranted their implementation in the first place. However, many knowledge gaps remain in the evaluation of innovation and technology extension investments in Latin America and the Caribbean. In particular, there are questions regarding the following areas:

(1) **Science:** Scientific support and advanced human capital interventions are important for productive development, but to what extent? The IDB Group has supported investments that increase scientific capabilities and advance the supply of human capital in science, technology, engineering, and mathematics. But the impact evaluation literature on these interventions is far more limited than it is for business innovation and technology extension programs due to the complexities of measuring the value of scientific knowledge (and its spillovers), the sometimes-limited sample sizes, and the normally long lags between the funding of scientific research and productive applications of the research outcomes. These are challenges to overcome, but it is still important to look for ways to conduct impact evaluations of programs that support science and advanced human capital interventions.

(2) **Spillovers:** Are value-chain-mediated spillovers different form labor mobility and geographical spillovers? If true, how should the design of innovation and technology extension programs internalize these differences?

(3) **Multi-treatment:** If different market failures coexist that affect the same innovation project, how should matching grants, credit, and

technology extension be combined both in terms of amounts and sequencing to deal with these issues?

(4) **Selection effects:** Can innovation and technology extension programs be made more effective by improving the selection mechanism of participants? If so, how can that mechanism be improved?

(5) **Data management:** How can efforts to get access to business registration data be improved? As the previous results show, linked employee-business data can be key for the evaluation of innovation programs. To date, however, access to such data is limited to very few countries in the region.

More research around these topics is critical for effective policy design, public-private coordination, and cost-benefit analysis of innovation policies.

What Works to Improve Lives?

What Works to IMPROVE EFFICIENCY THROUGH THE AGGLOMERATION OF FIRMS

While many public productive programs focus on individual firms that receive direct support such as investment grants or consulting services, some programs target groups of beneficiaries. The rationale behind broader targeting is to solve the lack of coordination between several, if not all, members of the group that forego the implicit and explicit gains of agglomeration.

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While many public productive programs focus on individual firms that receive direct support such as investment grants or consulting services, some programs target groups of beneficiaries – for example, firms corresponding to a specific sector in a specific location (industrial clusters). The rationale behind broader targeting is to solve the lack of coordination between several, if not all, members of the group that forego the implicit and explicit gains of agglomeration. Agglomeration economies – defined as efficiency gains due to sectoral or geographic proximity – originate from three sources: **(i)** public goods that enable factor-sharing among peers but that are very costly to create and access at individual scale (e.g., laboratories or production centers that micro and small firms cannot afford to run by themselves, but that they could afford if sharing the cost within an association); **(ii)** networks that enable gains from input-output linkages among articulated members of different scale within a common value chain (e.g., services for quality control and standardization of local suppliers of big corporations); and **(iii)** externalities arising from the interaction of firms due to their proximity (e.g., firms that operate in the same sector and/or location that can share knowledge or benefit from technology spillovers and labor market pooling through the interaction of their workers, suppliers, etc.).

These types of efficiency gains from coordinated collaboration are often not realized because in the individual decision process the coordination costs surpass the individual benefits (corporations do not have the time or budget to train several suppliers and SMEs cannot devote resources to coordinate the construction of a shared lab). This opens up an opportunity for centralized public interventions to foster coordination among actors and provide public goods that enable and enhance it.

EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

Three main lessons have emerged from seven IDB impact evaluations conducted throughout the region:

(1) Evidence on the tourism sector shows that policies promoting agglomeration economies can have substantial and long-lasting positive effects on industry performance.

(2) Benefits of coordination among firms can also be found in vertical articulation.

(3) Due to proximity, productive development programs have the potential to generate spillovers to nonbeneficiaries of the same productive cluster.

The sections that follow explore each of these three lessons in more detail.

(1) Evidence on the tourism sector shows that policies promoting agglomeration economies can have substantial and long-lasting positive effects on industry performance.

Policies that focus on local production systems, networks, and clusters (among others) usually target the firms within a specific sector in a specific geographic location (instead of individual firms). As such, the policies are expected to yield aggregate effects such as improving market competitive advantage as a whole. Yet, these types of policies require major coordination of several actors and simultaneous advancement

of several integrated treatments. That is the case for two tourism development programs supported by the IDB Group in the cities of Salta in Argentina (**IDB Project #AR-L1140**) and Colonia in Uruguay (**IDB Project #UR-L1020**). The tourism cluster encompasses multiple sectors, including hospitality, food, retail, and transportation, among others. As a result, the policies were designed and implemented as a coordinated set of interventions over a long period of time, and the evaluations of their effects were conducted for the entire sector rather than at the firm level.

Castillo et al. (2017) adopted a synthetic control approach in order to construct a comparable control group to analyze the long-term impact of the tourism development policy in Salta on employment. The policy included actions related mainly to three pillars: (i) modernization of tourism and transport infrastructure, (ii) tax credits for the construction, expansion, and remodeling of hotels and other lodging establishments, and (iii) institutional strengthening, which included additional funding for the Tourism Secretariat, the creation of a public-private Provincial Tourism Council, and the launch of an integrated national and international promotion campaign. The authors found an 11 percent average annual impact over 10 years on employment in the hospitality sector. The study shows that this growth did not happen at the expense of other industries and that tourism development policies generated positive inter-industry employment spillovers. For each job created in the tourism value chain, an additional job was created in the rest of the provincial economy.

Using a similar approach, Aboal, Crespi, and Perera (2020) studied the impact of a cluster development policy that focused on the tourism development of Colonia. This policy supported 19 initiatives that covered a wide range of interventions, from basic ones (such as the design of the website for Colonia) to more demanding ones aimed at inducing collective action (e.g., developing a common trademark, incorporating new marketing technologies such as QR codes, and strengthening Colonia's tourism institutions). The evaluation found a positive impact of the cluster program on the inflow of international tourists but no significant impact on total expenditures by tourists.

(2) Benefits of coordination among firms can also be found in vertical articulation.

Different firms that work within a value chain can mutually benefit. For example, standards to fulfill minimum quality controls for exports are required by corporations buying from supplying SMEs. In this case, the corporation could reduce the costs of getting standardized good-quality inputs from many local suppliers and, due to this improved standardization in quality, local suppliers could increase incomes by also selling to other corporations. Organized value chains also help mitigate the lack of confidence due to opportunistic behavior of members of those value chains. For example, a corporation may not want to invest in its suppliers because such an investment might also help the corporation's competitors (spillovers). On the other hand, a supplier may not want to invest resources in developing a product for a corporation, fearing that the corporation might appropriate the product and not let the supplier sell it to other corporations.

Supplier development programs aim to improve and stabilize the commercial linkages between small and medium-sized local suppliers and their large-firm customers (potential exporters) in order to achieve higher levels of flexibility and adaptability and to guarantee the quality of products and services at different stages of production. Arraiz, Henriquez, and Stucchi (2013) evaluated the impact of a Chilean supplier development program during 2003–2008 (**IDB Project #CH0160**). The program subsidized projects that aimed to strengthen the management of SMEs that supply large firms. A project subsidized by the program had to be sponsored by a large firm and include a minimum number of SMEs that constituted the firm's supply chain. The project cofinanced a diagnostic stage to assess the suppliers' needs, and then designed and implemented a development plan to benefit all parties. The program also subsidized activities that complemented the sponsor firms' projects (e.g., specialized services, professional advice, and training, among others). As a result, SMEs were expected to benefit from the creation of a stable market for their products and services, while the sponsor benefited from the creation of a continuous supply of quality products and services. Using panel data to control for observables and time-invariant unobservable factors that affect the participation and performance of firms, Arraiz,

Henriquez, and Stucchi (2013) found that both SMEs and large firms benefited from the program's coordination efforts. Supplying firms increased their sales, employed more workers, and paid higher salaries to their workers. At the same time, large firm customers increased their sales and their capacity to export products and services. The authors did not find evidence that the program affected large firms' employment, salaries, or survival. In addition, the evaluation found that the timing of the effects was different among the different groups involved: the effects on suppliers appeared one year after the firms enrolled in the program, whereas for large firms the effects took two years to appear.

Similarly, Monge-González and Rodríguez-Álvarez (2013) evaluated the impact of the Costa Rican supplier development program, CR Provee, during the period 2004–2011. This program was a multinational companies (MNCs) demand-driven program, which identified their main requirements for inputs and raw materials and then matched them with local suppliers. It also created business opportunities through small projects between SMEs and multinational companies, where the objective was to help local suppliers rise in the value chain, ultimately becoming global suppliers. Using a fixed-effects estimation and propensity score matching, the evaluation found that firms participating in the program showed higher average wages, labor demand, and chances of exporting than nonparticipating firms. Such benefits were observed up to two years after the first year the firm participated in the program. The amount of time that elapsed after initial participation in CR Provee, as well as the number of times that SMEs were able to generate linkages with multinational corporations, also had a positive impact on the performance of beneficiary firms.

(3) Due to proximity, productive development programs have the potential to generate spillovers to nonbeneficiaries of the same cluster.

The effects of productive programs targeted to individual firms (rather than agglomerates or chains) can spill over to other firms that are not direct beneficiaries of the programs. Free factor mobility coupled with sector or geographic proximity allows for technical transfer among the cluster's firms. An example would be firms belonging to an information and communications technology (ICT) cluster. Many of the owners or managers of ICT firms participate in university programs where knowledge is shared with other ICT firms. ICT firms also compete in the same labor market, and the labor force of these firms can transfer specific knowledge when moving from one firm to another.

Spillovers can occur due to geographic proximity, as shown by Boneu et al. (2014),[6] who conducted an impact evaluation of an ICT cluster program in Cordoba, Argentina (**IDB Project #TC-0204019-AR**) using a panel of firms for the period 2003–2011. This program offered project cofinancing to participating firms for joint activities carried out by two or more members of the cluster (e.g., participant firms jointly purchase inputs, or jointly work to acquire certifications of quality). The authors used a panel of firms in the ICT sector that allowed them to control for the dynamics of firms' sales and fixed effects under a generalized method of moments estimator. The results suggest that the program was effective not only in increasing the sales of firms that participated in the program, but also in increasing the sales of nonparticipant firms of the same type located on the outskirts of the city.

Figal Garone et al. (2015) followed a similar strategy and classified indirect beneficiaries as firms that did not participate in the program and that were located in a municipality where there were direct beneficiaries in the same industry. The authors evaluated the impact of Brazil's Local

6_ This study as well as that of Figal Garone et al. (2015) mentioned in this paragraph are also discussed by Maffioli, Pietrobelli, and Stucchi (2016), which also contains further discussion on cluster development programs and their evaluation.

Productive Arrangements (*Arranjos Produtivos Locais* - APLs) in the states of Minas Gerais and São Paulo on indirect beneficiaries. They used firm-level data on Brazilian SMEs for the period 2002–2009 and combined fixed effects with re-weighting methods.[7] The program helped with the preparation of strategic development plans to foster cooperation within the APL, and after implementing the plan beneficiary firms were supported through a variety of instruments (such as export promotion activities, training and technology transfer activities, creation of sector-specific technology centers, and other club goods) aimed at improving their performance. The evaluation found positive spillovers in export outcomes in the medium and long term, and a negative effect on employment in the first year after the program. The authors believe that the latter effect is the result of labor mobility from indirect beneficiaries to direct ones.

Spillovers can be also identified through labor mobility, especially for high-skilled workers. Instead of identifying indirect beneficiaries using geographic proximity criteria, as mentioned previously, Castillo et al. (2019) identified them through labor mobility when evaluating the case of spillover R&D matching grants provided by the Argentina Technological Fund (*Fondo Tecnológico Argentino* - FONTAR). In this study, indirect beneficiaries were firms that hired workers working in a direct beneficiary firm. The authors found that the firms indirectly affected experienced increases in employment, wages, probability of exporting, and value of exports. Similarly, Goñi Pacchioni, Gonzales, and Pardo (2018) tried to capture knowledge spillovers across firms due to the movement of workers from more-productive to less-productive firms. They used administrative records from 2012 to 2016 on the population of formal workers and firms in the private sector in Peru. Findings suggest that spillovers exist, given that less-productive firms improved performance after receiving workers from better-performing firms. This happened more across firms that had more than 50 workers and operated in more R&D-oriented sectors with highly educated workers in areas such as science, technology, engineering, and mathematics.

7_ APLs are clusters of firms within the same administrative area (e.g., municipality) that share a particular economic specialization and are usually supported by public and private organizations in Brazil that promote SMEs.

IDEAS FOR FUTURE WORK

New types of productive development programs involving new actors have been introduced in recent years. Policies to promote orchestrated development of entrepreneurial ecosystems in specific sectors (ICT, agritech, etc.) are modern adaptations of traditional horizontal agglomeration programs. Similarly, programs to promote collaboration between entrepreneurs and corporations – through open innovation challenges or initiatives to foster innovation in start-ups and SMEs via public procurement – are revamped versions of traditional vertical articulation programs.

The IDB Group is beginning to invest in these innovative programs all across the region and is supporting coordination among stakeholders in dynamic entrepreneurial ecosystems in Argentina, Brazil, Jamaica, Peru, and Uruguay. Open innovation initiatives are being considered for projects promoting innovation and vertical coordination between suppliers and demanders of technological solutions in Jamaica, Peru, and Uruguay. For example, in Peru, corporations in the mining sector work with independent entrepreneurs to adapt drones for the industry's different needs and to generate customized solutions. The IDB Group has supported the establishment of investment funds for strategic sector development in Brazil and Chile, as well as the development of technological poles in Panama and Uruguay. As policies and instruments are being renewed and adapted to the new capacities and needs of more suitable candidates for public support in the productive sector, evaluation of the effectiveness of this new generation of innovation initiatives targeting agglomeration and articulation policies is critical and constitutes a pending challenge for the years to come.

What Works to Improve Lives?

What Works for TRADE FACILITATION POLICIES AND TRADE AND INVESTMENT PROMOTION POLICIES

In addition to the costs associated with tariff and non-tariff barriers and with shipping goods between origins and destinations, trade costs arise when crossing borders and when searching for business opportunities in general and commercial partners in particular (Anderson and van Wincoop 2004).

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Trade costs are a key determinant of economic outcomes such as exports, employment, and sector- and firm-level productivity (Bernard, Jensen, and Schott 2006; Pavcnick 2002; Volpe Martincus et al. 2016). In addition to the costs associated with tariff and non-tariff barriers and with shipping goods between origins and destinations (i.e., domestic and international transport costs), trade costs arise when crossing borders and when searching for business opportunities in general and commercial partners in particular (Anderson and van Wincoop 2004). This section is twofold, as it provides evidence of the impacts of policies aimed at fostering trade and investment through the reduction of costs related to border administrative regulations and procedures, and to information.

Cost Related to Border Administrative Regulations and Procedures

Border agencies – including customs – develop and administer regulations and procedures that firms must follow when engaging in international trade. The aim of these regulations and procedures is to ensure the security, safety, and legitimacy of cross-border shipments as well as firms' compliance with fiscal rules. The evidence suggests that time spent at the border is an important component of the total time that it takes to move goods from their place of origin to their final destination. For example, Peruvian maritime import data reveal that, on average, total border times, and port and customs processing border times, respectively, accounted for 37.3 percent and 21.9 percent of the time on average (representing between 16 and 17 days) that elapsed between departure from the origin country's port and release from customs (Carballo et al. 2016a). Additionally, several studies from the IDB Group using transaction-level trade data for seven Latin American countries (Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Peru, and Uruguay) found that a 10 percent increase in customs processing times was associated with a decline in firms' exports ranging from 4 to 10 percent and with an even larger negative impact on firms' imports.[8]

8_ Volpe Martincus (2016) presents a summary of the studies that support this finding.

Factors that affect border times include **(i)** coordination among relevant agencies; **(ii)** the design of regulations and procedures and specific aspects of their implementation (e.g., multiple forms with overlapping fields versus single forms); and **(iii)** the technology available to complete those procedures (e.g., paper-based or electronic forms) and whether that technology is interoperable across all agencies or agency-specific. Although still clearly lagging behind North America and Europe, countries in Latin America and the Caribbean, with technical support from international organizations such as the IDB Group, have started to implement policies to facilitate cross-border shipments, thereby reducing times and costs for trading firms (Mesquita Moreira and Volpe Martincus 2019). These initiatives include more sophisticated and effective risk management systems (RMS),[9] authorized economic operator (AEO) programs,[10] electronic trade single windows (SW),[11] and streamlined international transit systems (ITS).[12]

9_ Risk management systems aim to maximize ascertaining which shipments should be inspected at the border in order to pay more attention and devote limited customs inspection resources to a substantially smaller subset of shipments that are considered riskier (i.e., less likely to be compliant with regulations) and thereby facilitate the border crossing of shipments with lower risk.

10_ AEO programs are cooperative arrangements between customs agencies (and other public border entities) and firms, whereby firms can get certified as complying with relevant supply-chain security standards based on a comprehensive inspection of their plants and their tax and customs behavior. Certified AEO firms receive trade facilitation advantages that primarily include less frequent physical and documentary customs inspections and expedited processing and release of shipments.

11_ Single windows for trade are arrangements that allow parties involved in trade and transport to lodge standardized information with a single-entry point to fulfill all import, export, and transit-related regulatory requirements. Their electronic variants enable online application, digital document exchange among agencies dealing with trade regulations, and issuance of trade-related permits and certificates.

12_ Streamlined international transit systems involve the simplification of clearance procedures, the gradual adoption of a single electronic form, and the interconnection of all participating border agencies to enable one-step clearance control at each bilateral border for goods transported through intermediate countries (customs territories) when shipped over land. Thus, shipments flow through third countries under customs control but there is no need to import and re-export the products at intermediate points or to pay import duties, domestic consumption taxes, or other charges.

Information Costs

Another important issue is that even though new information and communication technologies have substantially reduced search costs, the lack of information still severely handicaps firms seeking to operate beyond national borders (Leonidou and Theodosiu 2004; Allen 2014; Eaton et al. forthcoming; Startz 2018). For instance, firms intending to invest abroad must learn about the costs and conditions (e.g., sector-specific regulations) of establishing and operating in the destination country and engage in a costly process of identifying business partners and assessing their reliability and capabilities (Allen 2014; Rangan and Lawrence 1999). Information incompleteness is an important obstacle to trade and investment and hence to productivity and economic growth. Based on findings from econometric studies that explore the implications of immigrant networks and intermediating go-betweens, information costs have been estimated to range between 6 and 13 percent of trade values (Rauch and Trindade 2002; Feenstra and Hanson 2004; Anderson and van Wincoop 2004). Specifically, search costs have been found to account for about 90 percent of the relationship between trade flows and shipping distance (Allen 2014). Such information barriers can negatively affect trade and, consequently, productivity and economic growth (Volpe Martincus 2010).

Investments by firms to overcome these barriers can generate information spillovers, potentially creating a rationale for public intervention (Blyde, Pietrobelli, and Volpe Martincus 2014). Given that it is difficult to exclude third parties from information and that the use of information is non-rivalrous, there is potential for free riding on successful firms' searches for foreign buyers or locations. Followers may eventually imitate pioneering firms without incurring their costs and obtain important benefits from their investments. These spillovers, however, are generally not included in firms' private assessments. As a result, there is a gap between private and social returns, and firms may end up investing less in searches than would be socially optimal. This might provide a rationale for interventions in the form of public information services.

This section presents a review of the evidence on policy interventions supported by the IDB Group aimed at lowering the costs of searching for business opportunities (trade facilitation) and finding commercial partners abroad (trade and investment promotion policies). Additionally, countries around the world including those in Latin America and the Caribbean have established export promotion agencies (and investment promotion agencies) – in many cases with support from the IDB Group – to precisely deliver these services and accordingly address the market failures in question. This section also systematizes the main lessons from the impact evaluations of these agencies' activities carried out by the IDB Group .

TRADE FACILITATION POLICIES: EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

Four main lessons are the result of the agenda on impact evaluations in this area:

(1) Trade facilitation policies can help increase exports and imports, primarily through the shipment margin but with heterogeneous effects.

(2) Adoption of comprehensive risk management systems can improve the efficiency of customs (and other border agencies).

(3) The processes of border agencies should be coordinated, streamlined, and digitized.

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Cross-country two-sided reductions in border-related administrative costs seem to make a difference in terms of trade.

(4) Cross-country two-sided reductions in border-related administrative costs seem to make a difference in terms of trade.

The sections that follow explore each of these four lessons in more detail.

(1) Trade facilitation policies can help increase exports and imports, primarily through the shipment margin but with heterogeneous effects.

Evidence based on difference-in-differences and instrumental variable approaches applied to transaction-level trade and administrative processing data for several Latin American countries consistently indicates that trade facilitation policies and their instruments have helped trading firms increase their exports and imports and motivated other firms to venture abroad. This is the case of the electronic trade single window scheme in Costa Rica (Carballo et al. 2016b), a new transit system in Guatemala and El Salvador (Carballo et al. 2021), Authorized Economic Operators in Mexico (Carballo et al. 2016a), and a postal export regime in Peru (streamlining of export procedures and provision of intermediation services) (Carballo Schaur, and Volpe Martincus 2016b). These initiatives have also been cost-efficient. Additional exports and the associated increase in revenues (or cost savings) have substantially exceeded the costs accrued by the implementation, operation, and maintenance of these initiatives. For example, the study of Costa Rica's electronic trade single windows scheme estimated a cost-benefit ratio of US$16 for each dollar spent on the system (Carballo et al. 2016b).

Trade facilitation policies primarily operate through the shipment margin and have heterogeneous effects. The main channel through which trade facilitation policies have supported trade expansion has been through an increase in shipping frequency. Given that crossing borders has become easier and faster, firms have greater flexibility to respond to peer and consumer demands better and more efficiently. In addition, facilitation appears to have had heterogeneous effects and therefore to have

generated asymmetric trade gains. For instance, trade in time-sensitive products has grown the most relative to other type of products.[13] Moreover, while both small and large firms have benefited from these initiatives, the former appear to have also taken advantage of the procedural simplification to venture into new foreign markets. Furthermore, new-to-trade firms are clear winners, as they have experienced larger increases in their exports (Volpe Martincus 2016).

(2) Adoption of comprehensive risk management systems can improve the efficiency of customs (and other border agencies).

Evidence based on transaction-level data for Costa Rica, Ecuador, El Salvador, Guatemala, Mexico, Peru, and Uruguay suggests that physical inspections result in longer processing times. Inspection of every single shipment, or "blacklists" of firms, products, or countries, are suboptimal strategies to ensure compliance with norms and regulations given the longer processing times that these involve (Volpe Martincus 2016; Volpe Martincus, Carballo, and Graziano 2015). The adoption and improvement of risk management systems – as in the case of Uruguay – have been associated with reductions in the frequency of physical inspections without compromising the overall quality of those inspections. These reductions also have an impact on average processing time and therefore on cost (Volpe Martincus, Carballo, and Graziano 2015). However, it is important that these systems make use of appropriate econometric (and predictive) techniques to exploit all available relevant information to improve the effectiveness of targeting and reduce intrusive examinations that cause delays. This means going beyond the information generated by customs information systems and incorporating data from other agencies such as internal revenue agencies and social security administrations (Volpe Martincus 2016).

13_ Products for which short lead times are important, they are usually imported from close-by locations, and consumers value their timely arrival.

(3) The processes of border agencies should be coordinated, streamlined, and digitized.

Firms selling or buying products abroad usually have to interact with several border agencies that develop multiple trade regulations and oversee their compliance. Single windows streamline such administrative processes by enabling the digital submission and processing of required documents through a single online entry point. This was the case with the single windows in Costa Rica. Exploiting the gradual introduction of a single window using a difference-in-differences approach, an IDB Group evaluation revealed that firms that processed exports through the system had a growth rate of exports of 1.4 percentage points higher than those firms with products subject to the non-computerized procedures (Carballo et al. 2016b). Also, the estimated effects show that the incorporation of information technology positively affected the number of buyers to which firms sell, average sales to these buyers in terms of both value and quantity, and thereby the quantity shipped. Similarly, the evaluation of the Colombian electronic single window through which import-related permits started to be processed in 2005 showed an increase in the growth rate of firms' imports processed through the single window, also implying a growth in imports (Volpe Martincus 2016).

(4) Cross-country two-sided reductions in border-related administrative costs seem to make a difference in terms of trade.

Trade gains are substantial when the administrative burden is lowered on both sides of borders through coordinated actions across two countries. This is the case with simplified regional international transit systems, which involve unified border transit controls for goods shipped across countries that are not the final destination, and the use of a common electronic document and modern information technology to simultaneously comply with all relevant border formalities. Most developing regions do not have well-functioning transit regimes. However, one important exception is the Central American International Transit of Goods (*Tránsito*

Internacional de Mercancías - TIM) system. The TIM system covers border crossings between Costa Rica, El Salvador, Honduras, Nicaragua, Panama, and Mexico. The system includes stronger within- and across-country interagency cooperation as well as reengineered processes to have a comprehensive document that gathers all data required by customs. An IDB Group impact evaluation based on a difference-in-differences approach used transaction-level export data from 2007 to 2013 and took advantage of the gradual implementation of the system in El Salvador (the first country to adhere to the TIM system as a transit territory). The evaluation indicated that the exports of Salvadorian firms channeled through the new system had a growth rate 2.7 percentage points higher than their counterpart firms that processed under standard procedures. It seems that these new transit procedures have mainly affected the number of shipments, the quantity shipped, the number of buyers, and the number of shipments per buyer. To check for the external validity of the results, the authors of the study replicated the analysis using data on Guatemalan firms' exports and the gradual introduction of the TIM system in that country. They found results very similar to those in El Salvador (Carballo et al. 2021). The same holds true for the mutual recognition agreements of AEO programs (Carballo, Schaur, and Volpe Martincus 2016a).

TRADE AND INVESTMENT PROMOTION POLICIES: EVIDENCE FROM IMPACT EVALUATIONS SUPPORTED BY THE IDB GROUP

Three key lessons have been learned from impact evaluations of trade and investment promotion policies in the region:

(1) Export promotion policies and investment promotion policies work.

(2) Export and investment promotion policies have heterogeneous effects.

(3) Promotion activities should be combined and properly targeted to maximize their impact.

The sections that follow explore each of these three lessons in more detail.

(1) Export promotion policies and investment promotion policies work.

The IDB Group has conducted multiple studies of export promotion policies for several Latin American countries: Argentina (Volpe Martincus, Carballo, and Garcia 2012), Chile (Volpe Martincus and Carballo 2010b), Colombia (Volpe Martincus and Carballo 2010c), Costa Rica (Volpe Martincus and Carballo 2012), Peru (Volpe Martincus and Carballo 2008), and Uruguay (Volpe Martincus and Carballo 2010a). These studies used a difference-in-differences methodology with microdata on firms and found a positive and significant effect of export promotion support on firm-level exports. For instance, Martincus and Carballo (2008) evaluated the impact of firms assisted by Peru's export promotion agency. The authors found a 17 percent increase in the export growth rate of those firms relative to similar exporting firms that were not assisted by the export promotion agency. In Uruguay, Volpe Martincus and Carballo (2010a) used disaggregated export data for the entire population of exporters during 2000–2007 and found that export-supporting activities helped firms reach new destination countries.

In contrast to trade promotion, there are fewer rigorous micro-econometric evaluations of investment promotion agencies. These evaluations used firm-level data on both the establishment and location of multinational firms' affiliates and investment promotion assistance status in two countries in the region: Costa Rica and Uruguay (Carballo,

Marra de Artiñano, and Volpe Martincus 2021; Volpe Martincus et al. 2020). Evidence suggests that such assistance has a positive and significant effect on the probability that a multinational firm will establish a first affiliate in the respective country. In the case of Costa Rica, the authors used a difference-in-differences and instrumental variables methodology drawing from data on the establishment and location of affiliates of multinational firms to evaluate the effect of the assistance by the Costa Rican investment promotion agency over 2000–2016. Estimates suggest that investment promotion was effective and that the support from the investment promotion agency was associated with an increase of 11 percentage points in the probability that a multinational firm established its first affiliate in the country relative to other multinational firms that were not assisted by the investment promotion agency (Carballo, Marra de Artiñano, and Volpe Martincus 2021). As discussed earlier, these interventions can have additional benefits for the local economy – especially when combined with linkage programs – by encouraging the expansion of domestic firms. Box 5 features a case study of the benefits of CINDE, an investment promotion agency in Costa Rica.

Box 5. How Costa Rica's Investment Promotion Agency Helped Attract a Multinational Firm

The decision by the global management consulting firm McKinsey to set up an office in Costa Rica in 2010 was influenced by many factors, among them support from the Costa Rican Investment Promotion Agency (*Agencia Costarricense de Promoción de Inversiones* - CINDE).

Up until then, McKinsey's only office in the Americas was in Mexico. Setting up for the first time in Central America with little knowledge of how to operate in Costa Rica's free trade zone could have been daunting. But CINDE helped McKinsey navigate the bureaucracy to obtain the right permits. Initially planned as a Shared Services Center focused on a few functions, McKinsey's office now also houses an analytics team, design center, support for the company's

global IT infrastructure, and a sophisticated innovation center with 130 data scientists working directly with clients to provide solutions. With 1,000 employees, McKinsey's Costa Rica office is now one of the company's largest, and 94 percent of the employees are local.

According to Carballo, Marra de Artiñano, and Volpe Martincus (2021), investment promotion has been effective in attracting multinational firms to Costa Rica. CINDE has played a key role through its continued support to companies such as McKinsey, including inviting companies to conferences, promoting best practices, and acting as a liaison with the government.

Robert Tesoriero, Leader of the Global Capabilities and Insights Path in McKinsey's San José office, helped build its research and knowledge team. He acknowledges that operational costs would have been lower elsewhere, but believes the trade-off was worth it thanks to the added value the office can deliver due to its location. Tesoriero explained that McKinsey was drawn to Costa Rica for its talent, noting that the country, though small, has a deep pool of talent that is "well educated, bilingual, entrepreneurial, and connected to the United States."

Given the increasing number of multinationals that have established themselves in Costa Rica, Tesoriero does have concerns as to whether the country will continue to be able to provide the sophisticated talent McKinsey needs to succeed on a large scale. But he has confidence in CINDE's efforts to ensure that Costa Rican universities will "graduate the right talent" to help companies like McKinsey continue to thrive.

As for adapting to the COVID-19 pandemic, Tesoriero noted that the transition to working remotely was "relatively seamless" because most of McKinsey's staff already worked from home on a part-time basis – one of CINDE's recommendations to beat the traffic.

(2) Export and investment promotion policies have heterogeneous effects.

Trade promotion is estimated to have its strongest impact on export activities or on firms facing the most severe information problems and can be seen in several dimensions:

- **On the export-extensive margin, and particularly when firms attempt to penetrate foreign markets for the first time or try to enter an entirely new country or product market.** Such were the cases of Peru and Uruguay, where the exporting firms supported by the export promotion agencies increased exports both in terms of reaching new destination countries and introducing new differentiated products (Volpe Martincus and Carballo 2008, 2010a).

- **On foreign sales of differentiated goods, as in the case of exporter firms in Costa Rica.** Volpe Martincus and Carballo (2012) studied the effect of export promotion activities on different firms and found that in the case of firms selling only differentiated goods, export promotion was associated with an increase in exports through an increase in the number of countries to which they export.

- **On exports from smaller and less experienced firms with limited exposure to international markets.** Volpe Martincus and Carballo (2010b) used estimates of semi-parametric quantile treatment effects on export assistance in Chile and found that its impact varies significantly over the distribution of export outcomes, along both the extensive and intensive margins. In particular, smaller firms, as measured by their total exports, and relatively inexperienced firms seem to benefit more from export promotion actions. This was also the case in Argentina, where promotion assistance had non-uniform effects over the size distribution of firms. More specifically, the positive impact seems to have resulted in increased exports from small and medium-sized firms (Volpe Martincus, Carballo, and Garcia 2012).

- **On sales to destinations subject to financial crisis.** During the 2009 global financial crisis, exports declined in many countries. In Peru, firms that took advantage of export promotion programs did better during the crisis, after controlling for systematic differences between supported and control firms. Supported firms were more likely to survive on the export market and to continue exporting to countries hit by the crisis (Van Biesebroeck, Kongings, and Volpe Martincus 2016). As for investment promotion, the evidence from Costa Rica suggests that the effects are larger on firms from countries with which the host economy does not share a common language (Carballo, Marra de Artiñano, and Volpe Martincus 2021).

(3) Promotion activities should be combined and properly targeted to maximize their impact.

Export promotion agencies provide exporting firms with diverse services to ameliorate problems related to information. These services include counseling and general information on targeted markets, arrangement of meetings with potential customers, and organization and sponsorship of participation in such international events as trade missions and fairs. An impact evaluation of Costa Rica's activities in this regard through its national investment promotion agency found that information provision services had a greater impact than services to help firms complete procedures and find and hire personnel (Carballo, Marra de Artiñano, and Volpe Martincus 2021). Another IDB Group evaluation assessed the relative effectiveness of different promotion services carried out by Colombia's PROEXPORT from 2003–2006 by directly comparing their effects with each other on several measures of export performance with a multiple treatment matching difference-in-differences approach. Results suggest that firms that only participated in missions would have experienced higher export growth, especially along the product-extensive margin, if they had instead used counseling services (e.g., advice on export development plans and marketing strategies) bundled with an arrangement of trade agendas (e.g., specific bilateral meetings with potential buyers) (Volpe Martincus and Carballo 2010c). Finally, the evaluations mentioned above

(e.g. Carballo, Marra de Artiñano, and Volpe Martincus 2021) showed that bundled support services (i.e., counseling, missions and fairs, and trade agendas) provided throughout the export development process are more effective in helping firms increase and diversify their foreign sales than isolated actions (e.g., matching grants to participate in an international mission).

IDEAS FOR FUTURE WORK

The IDB Group has conducted a series of impact evaluations of the trade and investment facilitation and promotion initiatives adopted across various countries in the region. Box 6 offers a snapshot of how IDB Group research in the field has influenced trade policy in the region.

Countries are implementing new technologies such as blockchain to process trade transactions or to link countries' AEO programs and machine learning to perform risk management on the growing number of cross-border shipments, in general, and on international parcels resulting from the rise of digital trade, in particular. Furthermore, building upon these new technologies, agencies and their processes and programs are becoming increasingly interconnected both within and across countries through initiatives such as port community systems (e.g., Valparaiso, Chile),[14] single window regional interoperability (e.g., Pacific Alliance),[15] and even regional digital trade platforms encompassing multiple agencies in multiple countries (e.g. Central American International Transit

14_ Port community systems are a form of expanded single windows. They are electronic platforms that enable intelligent and secure information exchange between port authorities, customs and other border agencies, importers and exporters, and private transport operators both at the border (e.g., shipping lines, freight forwarders, stevedores, depots) and behind the border (pre- and on-carriage by road, rail, and inland waterways) (UNECE 2012).
15_ Single window interoperability refers to the ability of electronic trade single windows in two or more countries to securely exchange and use electronic information to simplify the procedures to comply with regulatory-related requirements for the movement of goods across those countries (UNESCAP 2018).

of Goods (TIM)).[16] The next frontier is to evaluate the impact of these new and innovative initiatives on firm (and country) trade and investment outcomes and on their overall performance – ideally in combination with randomized control trials. The IDB Group is already working on designing these types of evaluations. For example, specific trade facilitation initiatives (including risk management strategies and single window interoperability) affect the way foreign trade shipments are processed and, therefore, the associated times. These types of programs could be implemented through a random allocation mechanism for pre-defined sectors on comparable groups of firms. This should be based on the firm's behavior and patterns of previous exports and imports according to data from the customs and other border agencies as well as their characteristics and performance using tax agency data. Such mechanisms could include the allocation of the use of specific services or promotion to induce use of the new initiatives through targeted dissemination campaigns.

16_ Regional digital trade platforms are initiatives that involve regulatory harmonization and process automation and optimization for a number of countries within a given region to allow for simpler and faster electronic exchange of all trade-related documents.

Box 6. Promoting Evidence-based Trade and Investment Policies in Latin America and the Caribbean

Building on the IDB Group's operational activities, the IDB's Integration and Trade Sector has carried out a series of applied policy research projects aimed at generating evidence on the impact of trade and investment policies that are ubiquitous in the region and worldwide. These policies primarily include export and investment promotion and trade facilitation initiatives, whose design and implementation have received technical and financial support from the IDB Group in several Latin American and Caribbean countries.

These projects, which have featured the strategic collaboration of relevant government bodies and made use of novel data, produced the first set of comprehensive impact evaluations of the policies in

question and inspired similar undertakings in other regions (Cadot et al. 2015; Munch and Schaur 2018, among others). More precisely, the studies estimated the effects of these policies, helped reveal the mechanisms and channels through which the effects occurred, and used these estimates to compute cost-benefit measures. This effort has generated invaluable evidence to guide policymakers and the IDB Group's operational programs.

A few examples are illustrative of the various implications of these projects. In the trade facilitation realm, the study of the Costa Rican electronic trade single window has informed the design of the IDB Group-supported trade single windows in Trinidad and Tobago (**IDB Project #TT-L1044**) and Argentina (**IDB Project #AR-L1251**) and their planned impact evaluations. A study of the Central American International Transit of Goods (Tránsito Internacional de Mercancías - TIM) system was showcased as a measurement reference in the World Customs Organization Transit Guidelines (WCO 2017).

The studies from trade and investment promotion have helped in the design and evaluation of several IDB Group loans such as those to Paraguay (**IDB Project #PR-L1139**) and Uruguay (**IDB Project #UR-L1060**). They also have motivated several agencies to introduce changes in their practices, such as in the case of URUGUAY XXI, or re-think their strategic orientation, as in the case of the Agencia Costarricense de Promoción de Inversiones (CINDE), Costa Rica's investment promotion agency. In addition, they created the basis for a unique IDB-Group-led initiative on monitoring and evaluation with the framework of the Ibero-American Network of Trade and Investment Promotion Organizations (Red Ibero) (**IDB Project #RG-T2865**). That initiative generated several products, including 20 impact evaluations of organizations' trade and investment promotion activities (8 and 12, respectively), a baseline automated quasi-experimental evaluation methodology that can be implemented and replicated by organizations themselves, and the introduction of statistical approaches to guide their promotional efforts (quantitative intelligence).

Additionally, although there is a growing number of evaluations, there is still a clear need to better understand the impact of trade and investment promotion policies and their specific instruments on assisted firms' services exports, the buyer export extensive margin, and the overall performance as proxied by sales, number of employees, and productivity. There is also a need to better understand the potential spillovers and indirect effects of these policies, including particularly those associated with inter-firm production linkages. The IDB Group is currently conducting studies in close collaboration with countries in the region to close these knowledge gaps.

Furthermore, export and import promotion agencies are introducing new programs to help firms venture into and leverage digital trade and employ new approaches and technologies to conduct commercial intelligence and guide their promotional activities. The IDB Group has an established policy research agenda on digital trade. For instance, the IDB Group recently evaluated the impact of the online business platform *ConnectAmericas* on firms' exports using micro data from Peru. The results showed that firms experienced significant export gains from using this platform and that the observed effects were primarily driven by increased digital visibility and reduced information frictions (Carballo et al. 2020a, 2020b).

Finally, the IDB Group is working with agencies in the region to implement quantitative intelligence approaches. These consist of proactive strategies to promote exports and investments (contacts with firms initiated by agencies) based on the systematic use of multiple databases that generate predictions of commercial links and decisions to locate firms in order to guide the efforts of entities and maximize the effectiveness of their interventions. The impact of these new promotion strategies will be evaluated through randomized control trials.

CONCLUSION

This monograph has discussed a variety of program and policy interventions whose main goal is to increase the productivity of firms and foster their growth by providing labor force training, improving access to credit and risk capital, and encouraging dynamic entrepreneurship, agglomeration, innovation, and internationalization. Most of these programs operate at the individual or firm level, but some modify processes and regulations that are implemented at the country level or that promote policies at the sectoral level.

Overall, the evidence generated from interventions and studies supported by the IDB Group indicates that many of these interventions work, but in some cases the specifics related to their design and implementation are key for their success. The IDB Group has leveraged its operations and technical cooperation programs to produce rigorous knowledge not only on what policy instruments work best, but also, in many cases, on how they work and whether they successfully deal with the market failures that justified their implementation. Thanks to this effort, the IDB Group has contributed to closing significant knowledge gaps, though some gaps remain. There is still a need to better understand the heterogeneity of impacts for different categories of beneficiaries, as well as the role played by the intensity of treatment. Moreover, it is still not clear how well some of the interventions scale up, what the general equilibrium effects of such interventions are, or how long it takes to observe program effects. In general, the impact on productivity at the macroeconomic level of most of the interventions studied is not well known, although the limited scale of most of the programs suggests that the aggregate effects might not be very large for specific targeted programs.

In sum, there is a clear need for further research by the IDB Group and others to address this overarching knowledge gap in the literature. A challenge, as always, is the availability of data. Very few countries make

micro-level data available to researchers and following firms and workers over time tends to be difficult and costly (and it is uncommon to find firm-employee linked datasets in the region). This not only hampers knowledge generation, but also affects the ability of countries to make evidence-driven decisions about productive development programs and policies. Finally, there is not enough evidence about how these types of policies interact with each other, given that most interventions target only one dimension of the problem at a time. An interesting case to consider would be Costa Rica's linkage, investment promotion, and export promotion programs, which are likely to have important synergies. Greater understanding of these kinds of complementarities between programs will be important moving forward.

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