The Skills Development Challenge in Latin America

Diagnosing the problems and identifying public policy solutions

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CONTENTS

ACRONYMS

The following is a list of acronyms frequently used in this white paper.

CBE	Competency-based education
GER	Gross enrollment ratio
HE	Higher education
IDB	Inter-American Development Bank
LAC	Latin American countries
LS	Lower secondary education
NEET	Not in education, employment, or training
NSF	National Science Foundation
OECD	Organization for Economic Cooperation and Development
PISA	Programme for International Student Assessment
STEM	Science, technology, engineering, and mathematics
TERCE	Third Regional Comparative and Explanatory Examination
TVE	Technical and vocational education
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	U.S. Agency for International Development
USE	Upper secondary education

PREFACE

This white paper is a joint effort of the Inter-American Dialogue and Mathematica Policy Research.

Ariel Fiszbein led this study. The primary authors were Ariel Fiszbein, Clemencia Cosentino, and Belén Cumsille. The contributing authors were Mikal S. Davis, Chantal Toledo, and Kate Place of Mathematica Policy Research.

The authors benefitted from background reports on secondary and tertiary education prepared by Miguel Székely Pardo and Hernán Araneda, respectively. Anu Rangarajan helped conceptualize the project and provided guidance throughout.

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Douglas Besharov, Paul Decker, and Ariel Fiszbein formulated the idea for this project during the initial meeting of the International Network for Social Policy Teaching and Research.

ABSTRACT

Latin America's history has been characterized by fluctuating rates of economic growth, insufficient development of human capital, and high levels of income inequality. The end of a decade-long cycle of growth driven by high commodity prices signals that countries in Latin America must now face the challenge of improving productivity as a source of sustainable and equitable long-term growth. This requires tackling the challenge of skills development throughout the region.

In this paper, we demonstrate that, in spite of the striking increase in the years of schooling attained by adults in Latin American countries, there is consistent and compelling evidence of inadequate basic, technical, and socio-emotional skills development across the region. These gaps represent a bottleneck to productivity growth and to the ability of Latin American workers to obtain gainful employment. Our analysis also shows that relevance, quality, and efficiency limitations in secondary and tertiary education are key drivers of the skills development problem.

We advance four recommendations that seek to leverage policy tools (regulations, financial incentives, information, and public/private partnerships) to (1) better align the content and skills taught with the demands of the labor market (through competency-based and technical/vocational education), (2) enhance quality (through strengthened quality assurance mechanisms and widespread dissemination of information), and (3) improve graduation rates in secondary and tertiary education (in particular through outcomes monitoring and evidence-based solutions).

I. INTRODUCTION

A large and diverse region of more than 600 million inhabitants, Latin America's history has been characterized by fluctuating rates of economic growth, insufficient development of human capital, and high levels of income inequality. The end of a decade-long cycle of growth driven by high commodity prices signals that countries in Latin America must now face the challenge of improving productivity as a source of sustainable long-term growth. It is thus not surprising that governments, businesses, and the media are increasingly focusing on the challenge of skills development in Latin America. In this paper, we take a deep dive into this problem.

Based on the existing literature (papers, books, reports, newspaper articles, and other publications), our own analysis of existing data (where needed), and benchmarking whenever possible to other countries and regions of the world (mostly the Organization for Economic Cooperation and Development (OECD)), we provide a brief overview on the current state of skills development in Latin America, discuss upper secondary and tertiary education policies that influence skills development, and advance recommendations for leveraging policy to improve skills development in Latin America.

In chapter II, we diagnose the problem. We demonstrate that, in spite of the striking increase in the years of schooling attained by adults in Latin American countries, there is consistent evidence of inadequate basic, technical, and socio-emotional skills development across Latin America. These gaps represent a bottleneck to productivity growth and to the ability of Latin American workers to obtain gainful employment.

Having identified critical gaps in skills, in chapters III and IV we look for explanations. We ask a complex question: why, in spite of their fast expansion, are education systems in Latin America not generating the human capital required for sustained economic growth? We seek to answer this complex question by focusing on two key spaces in which skills development takes place: upper secondary schools and higher education institutions.

At both levels, we find sharp increases in participation as well as serious problems of quality, relevance, and efficiency, and analyze the extent to which contextual factors—such as the financial and regulatory arrangements that education providers operate under—create the right incentives for 21st century skills development.

In Chapter V, we conclude the paper by highlighting key challenges of reforming upper secondary and higher education services to make them better suited for skills development in Latin America. We identify the relative importance of different challenges for different subgroups in the population, and advance four recommendations that seek to leverage policy tools (regulations, financial incentives, information, and public/private partnerships) to address the interrelated problems of quality, relevance and efficiency pervasive across Latin America's education systems.

II. CURRENT STATE OF SKILLS DEVELOPMENT IN LATIN AMERICA

Sustained productivity and economic growth in Latin America will require a concerted and focused effort to understand and address skills gaps throughout the region. In this chapter, we provide an overview of the current state of skills development as a prelude for a discussion of upper secondary and tertiary education policies[1] throughout Latin America and how they affect the prospects for more effective skills development policies in the region.

A. A bird's-eye view of skills gaps

Educational attainment increases sharply throughout the region

In the past 20 years, there has been a striking improvement in the education levels of Latin America's population. All Latin American countries have experienced a sharp decrease in the share of their population at the low-skilled level, with a corresponding increase in medium- and highly skilled adults, as measured by the number of years of education attained by the adult population (ages 25 to 65; Table II.1 and Appendix A).

However, most Latin American countries are still far from the average attainment for countries that are part of the OECD, with a higher share of low-skilled adults and lower shares of medium- and highly skilled adults. In about half of Latin American countries, the low-skilled population represents the majority of adults.

There is also great variation in the average skill levels of different countries' populations. At one end of the spectrum, more than 70 percent of the adult population in Guatemala and Honduras is low-skilled and a scant number (6 percent to 7 percent) are highly skilled. At the other extreme, the adult populations in Argentina and Chile have attained skill levels that are closer to the OECD average.

Table II.1. Percentage of the adult population (25-65 year olds) by skill level

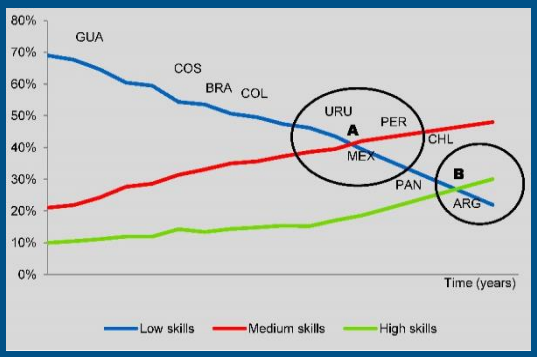
Country	Year	Low-skilled (0-8 years of education)	Medium-skilled (9-13 years of education)	Highly-skilled (13+ years of education)
Chile	2011	29.3	48.6	22.0
Argentina	2012	29.8	40.5	29.7
Panama	2012	34.8	38.9	26.3
Peru	2011	39.0	36.3	24.6
Uruguay	2011	41.2	39.8	19.0
Mexico	2010	43.4	39.5	17.0
Venezuela	2006	46.4	34.5	19.0
Bolivia	2011	46.8	28.5	24.7
Ecuador	2011	48.3	30.4	21.2
Colombia	2011	49.4	34.3	16.3
Dominican Republic	2011	51.9	31.1	17.0
Brazil	2011	52.1	32.8	15.1
Paraguay	2011	53.3	29.0	17.7
Costa Rica	2010	55.4	26.8	17.8
El Salvador	2010	56.7	31.3	12.0
Nicaragua	2009	68.1	21.2	10.7
Guatemala	2011	76.0	18.0	6.0
Honduras	2011	72.9	20.0	7.1
OECD average	**2012**	**24.0**	**44.0**	**33.0**

Source: Authors' calculations based on the latest available SEDLAC data[2] (for Latin America) and the Organization for Economic Cooperation and Development (2014).
Notes: Low, medium, and highly skilled categories for OECD countries represent, respectively, less than upper secondary, upper secondary, and tertiary education.

Three groups of workers characterize Latin America's economies

Figure II.1 below represents the archetypical skills trajectory for most Latin American countries: a sharp and steady decrease of the population's share of low-skilled individuals as a result of an expansion in primary schooling (now practically universal) and secondary schooling, and a corresponding increase in the shares of medium- and highly-skilled adults.

Figure II.1. The archetypical path to skills development



Source: SEDLAC (Appendix A).

There are two turning points in the archetypical skills trajectory. Point A depicts the point in time when the share of medium-skilled adults surpasses the share of low-skilled ones. This has already happened in Argentina (mid-2000s), Chile (1996), and Panama (2008), and is close to occurring in Mexico, Peru, and Uruguay. Point B represents the point in time when the share of highly skilled adults exceeds that of low-skilled adults, which has only taken place in Argentina.

Beyond formal education, Latin American adults are also acquiring skills through on- and off-the-job training. However, as shown in Appendix B, training opportunities increase with the level of education and, as a result, reinforce educational inequalities within the labor force.

Overall, skills development patterns in Latin America can be characterized by defining three groups within the population. First, a group we call "poor Latin American workers" does not complete secondary education (increasingly as a result of dropping out, as discussed in Chapter III) and has limited opportunities for formal training. This group constitutes the bulk of the labor force in most countries in the region (particularly in Central America) but, as a share of all adults, it has been diminishing over the years.[3] As more countries approach turning point A in Figure II.1, this group is bound to become increasingly older and, probably, marginalized.

At the other extreme, the "modern Latin American worker" completes secondary education and goes on to a higher education institution (university or tertiary non-university) but does not necessarily graduate. This group complement their skills development while in the labor force through a variety of training opportunities. This group constitutes a significant and growing share of the labor force in the more advanced countries in the region (which have already reached—or are close to— turning point B) but a much smaller one elsewhere in the region.

In the middle, the "traditional Latin American worker" completes secondary education before entering the labor market. Although better prepared than the first group and having access to more training opportunities, the productivity of early leavers is highly dependent on the quality of their secondary education—which, as we reveal below, is often poor. This group is the fastest growing in a majority of the countries in Latin America and, given the trends in upper secondary education coverage, is bound to become the largest group of the workforce in the not-too-distant future (Appendix A).

B. The evidence of skills gaps

A growing body of evidence indicates that educational systems in Latin America are not providing businesses with the human resources those businesses need to thrive and grow. Employers throughout Latin America increasingly report difficulties in finding qualified applicants for vacant positions: 42 percent reported this in 2015 employer surveys, compared to 34 percent in 2010 (Manpower 2015). Furthermore, it takes significantly longer to fill a skilled position in Latin America (an average of six weeks) than does in other regions of the world. For example, it takes an average of less than three weeks to fill such positions in South Asia (Walker and Aedo 2012). The primary reason for this discrepancy is a general lack of valued skills in job candidates.

But what skill sets do employers value that their potential employees lack? The literature points to three critical ones. First are basic skills, which are the foundational literacy and numeracy skills acquired in primary schools and reinforced in secondary schools (Md Nasir et al. 2011; Basic Skills Initiative 2007; OECD 2014b).

Second are technical skills, which are more advanced skills acquired through "the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic life" (UNESCO 2015). These skills are taught in specialized education programs in secondary schools (vocational or technical education) and in post-secondary education (tertiary non-university education, university education, and on-the-job training).

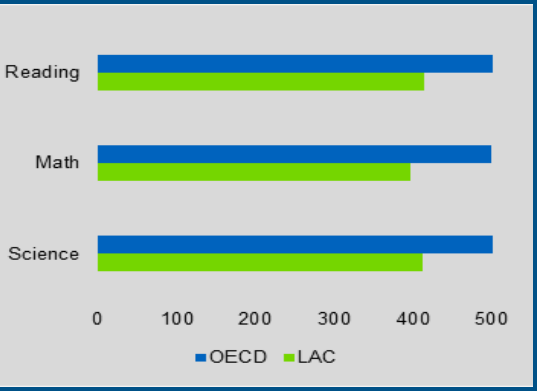
Finally, socio-emotional skills—also often called soft skills, transferable skills, and by many other terms—are a broad set of skills that may be acquired in multiple settings (school, jobs, home, volunteering) and are relevant to any job. They include problem-solving and communications skills, the ability to prioritize tasks, to work as part of a team, and others (Md Nasir et al. 2011; Economist Intelligence Unit 2009; World Economic Forum 2015; Heckman and Kautz 2012).

In this section, we discuss the evidence available on the gaps for each of these kinds of skills throughout Latin America.

International assessments provide compelling evidence of low basic skills

Student performance on international achievement tests provides compelling evidence of gaps in basic skills throughout Latin America. Results from the most recent round of the Programme for International Student Assessment (PISA)—in which over 500,000 15-year-olds from 65 countries are tested in math, reading, and natural sciences—show that, on average, students from the 8 participating Latin American countries score well below the OECD average in all three subjects (PISA 2012; Figure II.2).[4] The performance difference between students in Latin American countries and the OECD average translates to a difference of about 2 to 2.5 years of schooling. In mathematics, for example, 63 percent of the Latin American students had a low performance, which means that 15-year-olds are not able to use basic formulas and rules to solve problems with integer numbers (Bos, Ganimian, and Vegas 2014).

Figure II.2. Basic skills gaps in Latin America: PISA scores (2012)



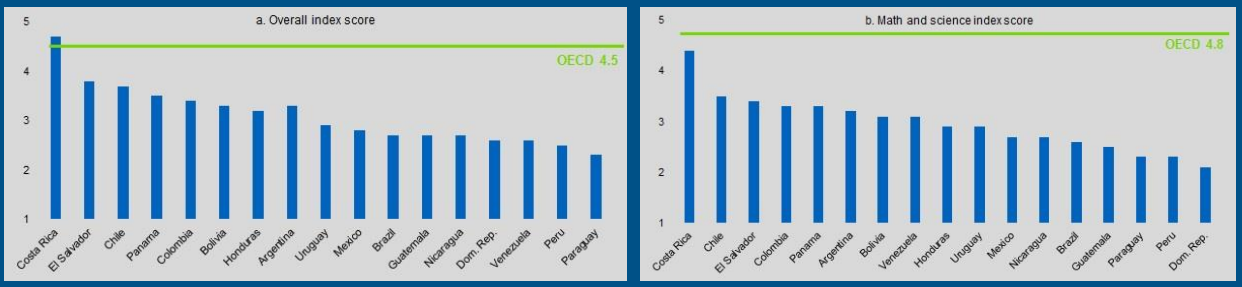
Source: PISA 2012 Results in Focus (OECD 2014c).
Notes: The OECD average includes all OECD countries except Mexico and Chile (total n = 32). The Latin American countries (LAC) average includes Chile, Mexico, Uruguay, Costa Rica, Brazil, Argentina, Colombia, and Peru (n = 8). Differences between the OECD and the LAC average scores are significantly different at the 1 percent level.

Similar strong deficits are seen in the results from the Third Regional Comparative and Explanatory Examination (TERCE), conducted in 15 Latin American countries to assess student performance in reading, math, and natural science in primary schools. For instance, almost 40 percent of 3rd grade students performed at Level 1 or below in reading, and close to half of 3rd grade students performed at Level 1 or below in mathematics (UNESCO/OREALC 2015). This poor level of performance in reading means that a 3rd grade student is not capable of identifying unambiguous information in a document if it is not highlighted in the text, repeated literally, and isolated from other information; and is not able to recognize rephrased sentences (UNESCO 2014).

The PISA and TERCE assessments also reveal considerable variation in achievement across Latin American nations. For example, average reading and math scores based on the 2012 PISA assessment in Chile translate to a result about 1.5 to 2 grade equivalents higher than in Peru (which had among the lowest scores of the eight Latin American countries in which students took the PISA assessment that year). Similarly, TERCE results in math show that the average score for 6th graders in Chile (580 points) was 33 percent higher than the average score of 6th grade students in the Dominican Republic (437 points) (TERCE 2014). Performance varied greatly within countries as well, with disadvantaged children performing more poorly on these tests. In fact, PISA 2012 results show a gap of nearly two years between students in the top income quartile relative to those in the bottom income quartile in most Latin American countries (Bos, Ganimian, and Vegas 2013).

These results speak to the low quality of these countries' K–12 education systems. A recent analysis conducted by the World Economic Forum—which captures the perceptions of the business community on the quality of general, math, and science education—finds that Latin American nations perform much lower than OECD countries, on average (Figures II.3). In 2014, nearly 3,700 members of the business communities of 17 countries in Latin America were asked to rate the quality of education in their countries on a scale of 1 (lowest) to 7 (highest). On average, their responses suggest that their perceptions of the quality of education fall well below those in the OECD in nearly all Latin American countries included in this study, both in general as well as in math and science.

Figure II.3. Quality of education in Latin America



Source: World Economic Forum (WEF) Executive Opinion Survey 2014, cited in WEF Global Competitiveness Report 2014-2015.
Notes: Quality of education is measured on a scale from 1 (lowest) to 7 (highest) based on perceptions of 3,675 executives in small, medium, and large businesses in 17 Latin American countries included in the survey.

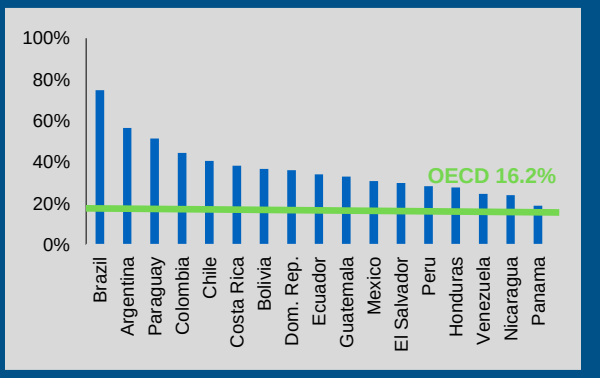
There are many factors contributing to the poor performance of schools in Latin America, from the high percentage of children that enter school with weak cognitive skills (Berlinski and Schady 2015) to teachers who are not well prepared or managed (Cumsille and Fiszbein 2015). What is clear is that a majority of young Latin-American students lack the cognitive skills that provide the basis for them to become effective workers in today's labor market.

Employer surveys focus attention on technical skills gaps, whereas national data support calls for more tertiary graduates in scientific fields (women in particular)

Unlike basic skills, technical skills are difficult to measure, especially across sectors. Few direct measures of technical skills exist—overall or in specific types of technical skills. However, employer reports of challenges in hiring shed some light on this issue. Data from the 2010 World Bank enterprise surveys reveal that the proportion of firms identifying an inadequately trained workforce as a major constraint in Latin American countries is more than double that observed in OECD nations as a whole; 34 and 16 percent, respectively (World Bank Enterprise Survey 2010).

The survey also reveals considerable variation in Latin American countries when it comes to the percentage of firms stating that an inadequately educated workforce is a major constraint (19 percent for the country with the lowest percentage reported, Panama, vs. 75 percent for the country with the highest percentage, Brazil) (Figure II.4). There is evidence that lack of technical skills is an important source of these difficulties. For example, the automotive and machinery industries, which require highly specialized technical skills, are the ones that have the greatest difficulties in finding skilled workers for their operations (OECD, United Nations and CAF 2015). Also, a high proportion (close to 30 percent) of working age people in Bolivia and Colombia report that the lack of ICT (information and communication

Figure II.4. Percentage of firms identifying an inadequately educated workforce as a major constraint (2010)



Source: World Bank enterprise surveys (2010).
Notes: Data are from 2010 for all nations except Brazil, for which data are for 2009. The OECD average excludes Chile, Mexico, and Turkey.

technology) skills is a constraint on achieving employment and higher earnings, compared to 10 percent in other countries such as Georgia or Macedonia (World Bank 2016).

These findings mirror those of a recent survey by Manpower (2015), previously cited, which suggests that firms in Latin America are having difficulty filling jobs due to an inadequately educated workforce. The Manpower report also finds that this problem has been escalating throughout Latin America since 2009. From 2010 to 2015, the region saw an increase of 8 percentage points in the share of employers reporting that an inadequately educated workforce posed a barrier to hiring (from 34 to 42 percent). In particular, over the last three years, jobs requiring technical skills have become increasingly difficult to fill. The year 2015 marked a milestone as it was the first year that employers ranked "skilled trade" positions as the hardest to fill, up from second place in 2014 and 4th place in 2013 (Manpower 2015). Among the 10 hardest positions to fill in Latin America, there are several occupations that require technical skills by definition: technicians (number 2), engineers (number 6), and production operators/machine operators (number 7).

Evidence of technical skills gaps can also be observed for specific industries. A case in point is the information technology (IT) industry, an increasingly important one for growth and competitiveness. Recent surveys indicate large and hard-to-address technical skills gaps in the sector (Box II.1). Also, the oil industry in Mexico (O'Connor and Viscidi 2015), and the mining sector in Chile have identified problems in finding qualified workers. Mining is by far the most sophisticated and relevant economic sector in Chile. Though usually described as "extractive" and considered as demanding low-level skills, the reality is that mining is a highly technologized sector operating with high quality standards. The Mining Industry Skill Council (*Consejo Minero*, the association of mining companies) has identified important quantitative and qualitative skills gaps that tertiary education has not been able to close (CCM 2015). Tertiary educational institutions lack the incentives to better align their programs with industry needs, so industry itself decided to push forward a mining skills strategy to deal with the identified gaps.

Box II.1. Skills gap in information technology in Latin America

In an increasingly globalized economy, the information technology (IT) sector stands out as critical to a nation's competitiveness, and it also acts as a vector of social development and transformation by improving basic services, enhancing connectivity, and creating employment opportunities (World Economic Forum 2015). A recent international ranking put the IT sector among the top 10 sectors with the hardest positions to fill in 42 countries, and it was number 8 in Latin America (Manpower 2015 survey of 41,700 hiring managers).

Indeed, a study by IDC indicates that skills gaps in the IT sector in Latin America are large. A survey of 767 IT managers in 8 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Mexico, Peru and Venezuela), conducted between May and July 2012, revealed a gap of 35 percent between supply and demand for skilled workers (Aducci et al. 2013).

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Gaps are particularly large when jobs require specific networking skills. These include (1) essential skills (general networking skills, PC hardware and software skills, network design and architecture, security skills, wireless network skills, and IP telephony and IP networks skills), (2) emerging skills (data center networking skills and understanding how applications, such as unified messaging and video conferencing, can impact business), and (3) skills in multiple technologies. All areas have a large skills gap (73 to 87 percent). Security skills and general networking skills (maintenance and operations) have the largest gaps (87 percent and 85 percent, respectively).

One potential explanation for these observed gaps is the limited amount of IT education in primary and secondary schools. Only 24 out of 38 countries (63 percent) in Latin America have specific objectives or courses on basic computer skills at primary and secondary levels of education (UNESCO 2012).

A second potential explanation is the low levels of English proficiency in Latin America, which can impede access to information and tools in the Internet and hinder the development of programming skills. For example, 12 of 14 Latin American countries included in the widely used English Proficiency Index (EF EPI) attain low English proficiency levels, and this is particularly the case among young adults and men (EF EPI 2014).

Another possible explanation is limited access to the Internet, which may make it more difficult for individuals to acquire and supply IT skills. Internet usage throughout Latin America is generally low: 42 percent of individuals use the Internet, compared to 81 percent in OECD countries. In poor economies (such as those of Nicaragua or Guatemala), access to technologies in general is very limited. In these countries, technology use (including Internet use) is limited even among the richer households (IDB 2011). In contrast, in several wealthier nations such as Brazil, Chile, Uruguay, Costa Rica, and Mexico, access to the Internet in the richest households is comparable to the OECD average.

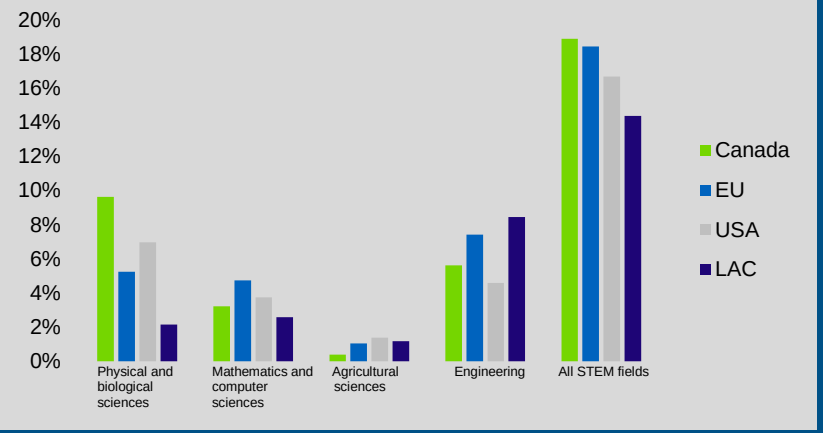
Governments are seeking to respond to these gaps. Through a large-scale initiative called "Enlaces," the Chilean government has equipped secondary schools with computers and Internet connectivity, and trained teachers in educational uses of digital technology in an effort to help schools use information, technology, and communication technologies (ITCs) for teaching and learning. In Panama, the program "Entre Pares" trained 100 percent of teachers in the use of new technologies in education. In Colombia, the program "Plan Vive Digital" provides in-person and online ITC training to groups prioritized based on vulnerabilities (such as the elderly) or potential for direct positive public impact (such as public employees, teachers, and librarians).

Regional initiatives to promote IT skills reinforced national efforts by focusing on specific populations. A good example is the program "Entra 21" launched by the International Youth Foundation with funding from several agencies such as IDB and USAID and the private sector (2001–2011). It targeted unemployed youth ages 16 to 29 in 22 countries in Latin America and the Caribbean, providing them with short-term training (270 hours to 1210 hours over 4 to 12 months) in technical skills, life skills and job-search skills, and combined this with internships with local employers. More than 135,000 young people participated in this program. Almost half of the training focused on information and communication technology skills, responding to growing employer demand in this sector.

A particular area of concern is the presence of skills gaps in the STEM fields. A cross-national comparison of the share of first university degrees awarded in STEM fields shows a slightly lower ratio in Latin American nations compared with the United States, Canada, and the European Union. On average, 14 percent of university degrees are awarded in STEM in Latin American countries, versus 17 to 19 percent in the other regions (National Science Foundation 2016).

Notably, the lower prevalence of graduations in STEM throughout Latin America is driven by low rates in STEM fields other than engineering, namely, the physical and biological sciences, mathematics, and computer science (Figure II.5). For example, in Latin American countries, only 2 percent of graduates received degrees in the physical or biological sciences, compared to 10 percent in Canada and 7 percent in the United States. In contrast, Latin American countries fare slightly better in producing engineering graduates at levels closer to these other developed nations.

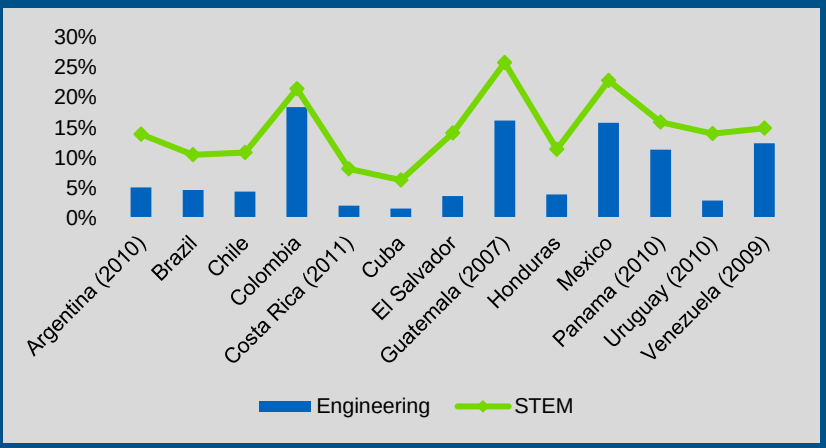
Figure II.5. Percentage of degrees awarded, by STEM field and country/region (2012 or most recent year available)



Source: National Science Foundation, Science and Engineering Indicators (2016).

There is, however, wide variation within Latin America on the extent to which students are more likely to pursue university studies in engineering versus other math- and science-related fields (Figure II.6). In several countries—including Colombia, Mexico, Panama, and Venezuela—engineering seems to account for the vast majority of STEM degrees, whereas in other countries, engineering is well represented, but does not crowd out participation in other fields of study.

Figure II.6. Percentage of degrees awarded in engineering and STEM, by country/region (2012 or most recent year available)



Source: National Science Foundation, Science and Engineering Indicators (2016).

Despite the relatively high percentage of engineering graduates, both employers and governments have expressed a need for more engineers. For example, in Colombia, the Ministry of Information and Communication Technologies projects a shortage of up to 63,000 engineers by 2020 (MinTIC 2014). To incentivize students to pursue degrees in engineering and IT, the government of Colombia is now financing 75 percent of university tuition for students who complete qualified engineering and IT degrees (MinTIC 2016). Similarly, the Argentine Center of Engineers estimates that Argentina needs 15,000 new engineers each year to fill current and projected demand, but only about 6,000 engineering degrees are awarded annually (CAI 2014).

Available evidence suggests these shortages are driven by problems along the educational pipeline—from low numbers of students going into engineering to low numbers graduating from engineering programs. Explanations include deficiencies in earlier preparation in secondary school (which prevents students from entering or, if they do enter, succeeding in technical studies), lack of student interest and self-confidence, and inadequate university training that yields engineering graduates who lack the skills sought by employers (Box II.2).

Box II.2. A shortage of engineers in Latin America?

On average, more students become engineers in Latin America (9 percent) than in the United States, Canada, and the European Union (5, 6, and 8 percent, respectively). This difference is more striking in some countries such as Colombia, where 18 percent of first university degrees awarded in 2012 were in engineering (NSF 2016), and less striking when Latin American nations overall are compared with some EU nations that traditionally have had high representation of engineers (such as Germany with 11 percent).

Yet firms in Latin America do report shortages of qualified engineers. A 2015 survey of nearly 14,000 hiring managers in Argentina, Brazil, Canada, Colombia, Costa Rica, Guatemala, Mexico, Panama, Peru, and the United States found that engineering jobs are among the top 10 jobs employers have difficulty filling, particularly in Colombia (top 1), Argentina (top 2), and Brazil (top 8) (Manpower 2015). This corresponds with findings from a report by the Argentine Ministry of Education (Ministerio de Educación de la Nación, 2012) showing that local universities graduate one engineer a year for every 6,700 inhabitants—a ratio that is much lower than that observed in China (one in 2,000) or Germany and France (one in 2,300). Argentina's neighbors—Brazil (1 in 6,000) and Chile (1 in 4,500) —share this problem.

Explanations for the shortage of engineers can be found by reviewing students' educational trajectories. Some evidence suggests that secondary school graduates lack the self-confidence or math and science background needed to study engineering. Results from PISA 2012 indicate that self-confidence in mathematics ability among Latin American students is among the lowest in the world, and their levels of anxiety about both mathematics problem-solving and success in mathematics classes are among the highest (OECD 2013). Between 70 and 80 percent of students in Argentina, Brazil, Chile, Costa Rica, Peru, and Uruguay reported being worried about the difficulty of mathematics classes (compared to 59 percent in the OECD). And nearly 90 percent of Mexican students reported being concerned about their low math performance.

Other students may opt out of engineering programs at university because they lack accurate information about engineering career opportunities. For example, in Colombia, findings from a 3,000-student survey revealed that students perceive that large companies prefer to hire foreigners (Serna and Serna 2013). Of the 1,542 survey respondents in their final year of secondary school, 44 percent indicated that they elected not to pursue engineering in university because the descriptions were confusing or the offerings were overwhelming. According to Serna and Serna, Colombia offers 93 distinct engineering programs, in comparison to 48 in Brazil and

… (continued)

45 in Mexico. In interviews, deans of engineering schools in Colombia also noted that the descriptions of engineering fields are too complex and confusing and that there is a disconnect between engineering fields and career counseling in schools that diverts potential students away from engineering (Lizarazo 2015).

Yet other students do enroll in university engineering programs, but do not graduate. In Argentina, engineering graduation rates are approximately 20 percent and in Colombia 28 percent (Funes 2013; Sistema de Prevención y Análisis de la Deserción en las Instituciones de Educación Superior (SPADIES) 2013). Low levels of preparation in high school physics and math, and especially in algebra, are cited as major factors for dropping out (SPADIES 2013).

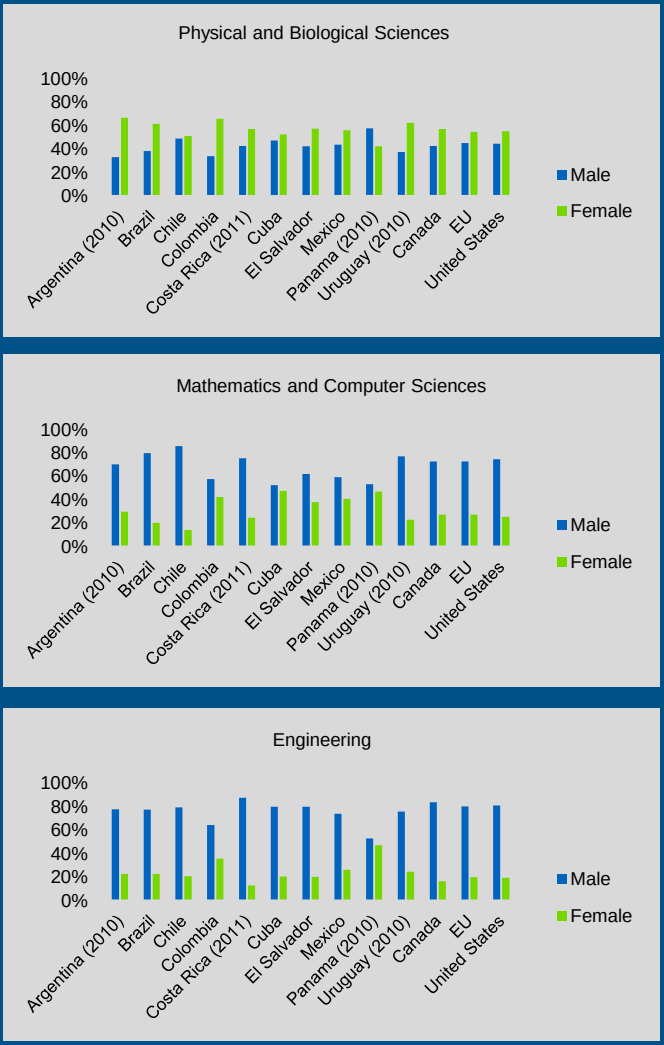
Many students do graduate with engineering degrees—about 6,000 a year in Argentina (CAI 2014)—but do not work as engineers. In Brazil, only 38 percent of engineering graduates are working as engineers (IPEA 2011). One explanation is that engineering graduates are offered positions in different fields—such as business or finance—because their degrees serve as market signals that they possess strong analytic and mathematics skills. Another—which highlights an area of focus of this paper—is that there is a mismatch between the skills sought by employers and those acquired by graduates (IPEA 2011).

A strong contributing factor to shortages is the limited representation of women in the ranks of engineers. As is true in other parts of the world, women are underrepresented in STEM fields throughout Latin America. Among STEM graduates in nearly all countries, women are more likely to graduate with degrees in physical and biological sciences than with degrees in mathematics, computer science, and engineering (Figure II.7).[5] Lack of self-confidence, particularly in their math abilities, may help explain why fewer women graduate in engineering, computer science and mathematics. Findings from the 2012 administration of PISA to 15-year-olds indicate that girls in Latin America express lower confidence in their math abilities and have higher levels of math anxiety than boys do, even after controlling for their performance through test scores (OECD 2013).

A literature review conducted by the Inter-American Development Bank, which draws from evidence in Latin America and beyond, suggests that a lack of role models and support systems, as well as low self-confidence in their math and science abilities, lead many young women away from STEM fields (Castillo et al. 2014).

Striving to address these problems and achieve gender parity may help respond to employer demand and, as the experiences of two nations show, may be attainable. Panama has almost closed the gender gap, as 47 percent of its graduates in mathematics, computer science, and engineering in 2010 were women (Figure II.7). And Colombia has higher percentages of female graduates in these fields than nearly all other countries in the region, as well as Canada, the European Union, and the United States.

Figure II.7. Percentage of degrees awarded by gender and STEM field (2012 or most recent year available)



Source: National Science Foundation, Science and Engineering Indicators (2016).

Research indicates that socio-emotional skills are highly valued and rewarded by employers, yet development of these skills is generally absent from curricula

"Life skills"—defined as the ability to negotiate, network, collaborate, and work in a culturally diverse atmosphere—were cited as one of the most needed skill sets by 192 senior executives surveyed across Latin American countries (EIU 2009). Employers consistently report that these skills, also known as socio-emotional or transferable skills, are as important as basic and technical skills, if not more important. This view holds among employers in and outside of Latin America.

A McKinsey survey of 2,832 employers in nine countries (Brazil, Germany, India, Mexico, Morocco, Turkey, Saudi Arabia, the United Kingdom, and the United States) revealed that 80 percent of employers ranked work ethic and teamwork as the most important skills for employees, followed by oral communication skills (72 percent) (McKinsey 2012).

A Demand for Skills Survey conducted in early 2010 with 1,176 private firms in Argentina, Chile, and Brazil revealed that when asked about the value of different types of skills, firms report valuing socio-emotional skills more than they value general or industry-specific knowledge (IDB 2012). The score assigned to socio-emotional skills was almost twice the one assigned to knowledge and about four times the one given to industry-specific skills.

Consistent with the findings from employer surveys revealing that employers value socio-emotional skills, there is also some evidence that employers may indeed be making hiring and salary decisions that align with their opinions. In Mexico, results from a survey of 1,556 employers indicate that

employers would pay more for an employee that can make decisions, has abilities in negotiation and conflict resolution, has a sense of responsibility, can identify opportunities to improve the employer's products, knows how to relate to clients, can provide new ideas, and has a sense of punctuality (Encuesta de Competencias Profesionales 2014).

The literature also suggests that stronger socio-emotional skills are correlated with positive employment outcomes. Active and employed individuals tend to have higher scores on socio-emotional skills than inactive people do. On the one hand, socio-emotional skills play a role in finding a job or setting up a business. On the other hand, employment contributes to maintaining and developing socio-emotional skills.

The World Bank's STEP Skills Measurement Program collected data on socio-emotional skills, such as "the big 5" personality traits (openness, conscientiousness, extraversion, agreeableness, and emotional stability) and grit (broadly defined as perseverance and passion for long-term goals) in a number of countries including two Latin American countries, and found a positive correlation between those traits and employment.

For example, in Bolivia, employment is associated with higher scores for conscientiousness and grit, whereas in Colombia, greater extroversion is positively correlated with more contact with clients at work (World Bank 2014). In Peru, a study that uses a labor force survey of the working population (ages 14 to 50) found that soft skills and cognitive skills are valued more or less the same by employers as reflected in earnings (for instance, a change of one standard deviation in an overall cognitive skills measure led to a 9-percent increase in average earnings, which was similar to the effect that the perseverance facet of the grit trait had on average earnings, conditional on schooling) (Diaz, Arias, and Tudela 2012).

Previous studies have also revealed a relationship between socio-emotional skills and the labor market. For example, Nyhus and Pons (2005) found that emotional stability is positively associated with the wages of both women and men, whereas agreeableness is significantly associated with lower wages for women. Mueller and Plug (2006) found significant effects of the big five on earnings. Heckman, Stixrud, and Urzúa (2006) showed that non-cognitive ability affects the acquisition of skills and productivity in the market. Similarly, Heckman and Kautz (2012) review the literature on soft skills and present evidence to show that "soft skills predict success in life."

Although Latin American educational systems directly promote cognitive skills, in general they do not address the development of socio-emotional skills, particularly in primary and secondary schools, and mainly focus (albeit without much success) on academic achievement (IDB 2012). Brazil, Chile, and Mexico do, however, include the development of socio-emotional skills as an objective in their education systems, although only Chile and Mexico include them specifically in their curricula.

The relative lack of attention to the development of socio-emotional skills in schools contrasts with the importance potential employees give to those skills. Employer surveys such as Manpower (2015) and the Encuesta de Competencia Profesionales (2014) suggest that a generalized lack of socio-emotional skills among applicants is a key factor explaining the difficulties employers face in filling vacancies.

C. Understanding the bottlenecks to skills development

In this chapter, we have demonstrated that, in spite of the striking increase in the years of schooling attained by adults in Latin American countries, there is also consistent evidence of inadequate academic, technical, and socio-emotional skills. These gaps represent a bottleneck to productivity growth and to the ability of Latin American workers to obtain gainful employment.

What are the key factors that contribute to these observed gaps? In particular, why, in spite of their fast expansion, are education systems in Latin America not generating the human capital required for sustained economic growth? With this report, we seek to answer this complex question by focusing on two key spaces in which skills development takes place: upper secondary schools and higher education institutions.

In each of the next two chapters, we consider how the organization and governance of these two sub-sectors of the education system create or do not create the conditions for young people to develop the skills demanded by employers. In each case, we provide a general description of the organization and size of the sub-sector, as well as the labor market performance of graduates. In chapter IV on tertiary education, we also analyze the extent to which the financial and regulatory arrangements that education providers operate under create the right incentives for them to provide relevant skills development services.

Based on that analysis, we conclude the report by exploring the challenges of reforming upper secondary and higher education services to make them better suited for skills development in Latin America.

III. UPPER SECONDARY EDUCATION AND SKILLS DEVELOPMENT

Upper secondary education (USE)[6] plays at least three critical roles in promoting skills development in Latin America.

First, given the low quality of schooling at the primary and lower secondary levels (Oviedo et al. 2015), USE often serves a remedial role in addressing students' academic weaknesses so as to prepare them to tackle higher academic objectives.

Second, USE is expected to play a double role in preparing the large number of students who will continue on to tertiary education (both university and non-university)—the group we referred to as 'the modern Latin American worker'—and offering alternatives to youth for whom USE will be the terminal education level, the group we referred to as the traditional Latin American worker, thus helping them in their transition into the labor market.

Third, students in USE are in a period of their life cycle that is critical for the development of their personality and decision-making capacity, the construction of behavioral patterns, the acquisition of capabilities for social interaction, and the development of their personal identity and relationships toward peers. A constructive school environment provides the protection, support, and integration needed for adolescents to thrive and develop as young adults.[7]

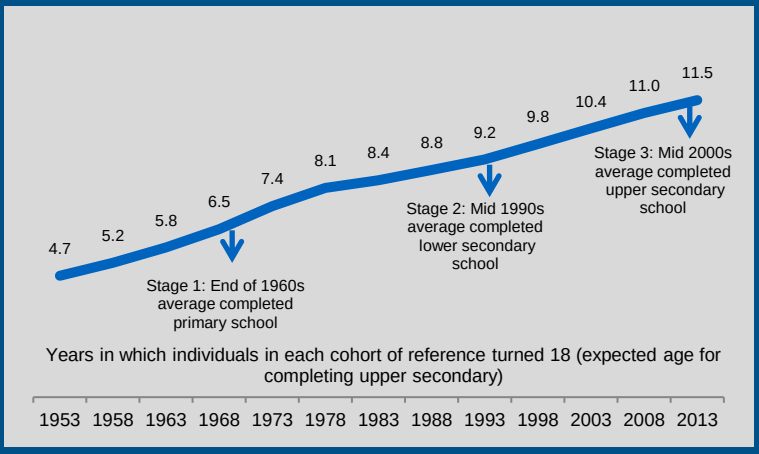
In this chapter, we first present the stylized facts of the evolution of USE in the region. Given our interest in skills development, we pay particular attention to technical and vocational education (TVE) options, compared to the general academic path. Next we discuss evidence on the value labor markets are giving to USE and TVE, as an indirect measure of their quality and relevance. In a third section, we examine USE reform efforts in Latin America, before offering some conclusions on possible pathways for improving USE in the region.

A. Participation in upper secondary education

Low completion of upper secondary education is the new bottleneck in educational achievement

Schooling levels in Latin America show a pattern of sustained long-term growth over time, achieving nearly universal completion of secondary education. As Figure III.1[8] shows, the cohorts born in 1935 completed an average of less than 5 years of schooling, compared to 11.5 years among those born in 1995. This development represents an increase of nearly 7 years of education.

Figure III.1. Average years of schooling for cohorts born between 1935 and 1995



Source: Adelman and Székely (2015).
Note: See endnote 8.

On average, Latin American nations achieved key milestones in 1968 (the year that marked widespread completion of primary education), 1993 (in which completion of lower secondary education was achieved), and 2013 (when students fell short of completing upper secondary education by only half a year).

Table III.1. Secondary school enrollment in Latin America

Secondary level	Age	School enrollment of cohort exiting USE in 1998–2000	School enrollment of cohort exiting USE in 2012–2014
Lower secondary	12	72	93
	13	68	90
	14	61	86
Upper secondary	15	56	83
	16	52	77
	17	46	70
	18	39	n.d.

Source: Based on Bentaouet-Kattan and Székely (2015).

The principal challenge to achieving universal USE is not in enrollment but in completion. Table III.1 displays the share of youth enrolled in school by age across two generations. It shows remarkable improvements in enrollment since the beginning of the century. For example, the share of 15-year-olds still enrolled in school rose from 56 to 83 percent in a 12- to 14-year period (between 1998–2000 and 2012–2014).

Although improving, dropout rates to the end of secondary school remain high. By age 17, 30 percent of youth have dropped out of school. In fact, nearly one out of every four Latin American youth in lower secondary school drops out before completing USE. In the earlier period, the majority of those who dropped out did so before entering USE. That is not the case any longer. USE completion has become the new bottleneck in Latin American education systems.[9]

What are the key factors behind high dropout rates in USE in Latin America? Several factors—personal, school, and economic—explain this phenomenon. Data from eight countries in the region (Bolivia, Chile, Costa Rica, Dominican Republic, El Salvador, Honduras, Panama, and Paraguay) suggest that the main reasons for school dropout among 13 to 15 year olds are lack of interest (33.2 percent) and economic hardships (21.3 percent) (IDB Graduate XXI n.d.). Another problem is lack of school and teacher preparation to support students who come from vulnerable contexts (Bassi et al. 2012). In addition, during this period (1998-2000 and 2012-2014), lower fertility rates, greater economic stability, higher wages, and more employment opportunities had a positive effect on household incomes, which led to increased human capital investments. However, increases in the share of poorer youth accessing the schooling system, combined with reductions in the relative returns to education, tended to increase dropout rates. Overall, these two forces resulted in increased enrollment but scarce completion (Bentaouet-Kattan and Székely 2015). The implication is that in most countries in the region, a majority of youth will enter the labor force with some (but not a complete) secondary education, becoming part of the group we characterized earlier as the 'poor Latin American worker'.

Participation in technical and vocational secondary education is generally low

However, many youth do not even make it into the labor market. Approximately 20 percent of Latin American youth are not in education, employment, or training (NEET), compared to a 16 percent OECD average (International Labour Office and International Labour Organisation 2013). This

phenomenon—NEET—is associated more with school dropout than labor market abandonment (Cárdenas, de Hoyos and Székely 2014).

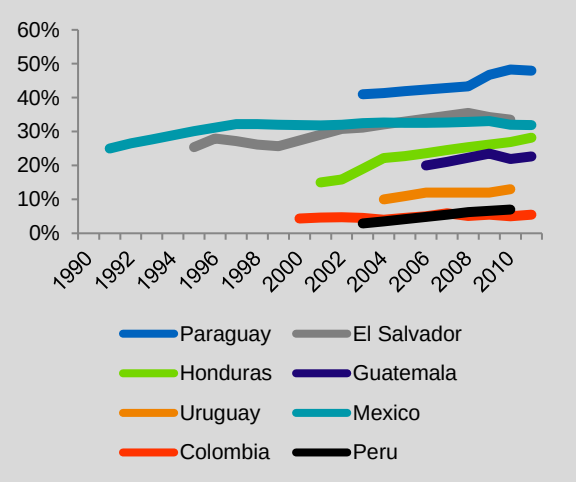
It thus would be reasonable to expect higher demand for USE options that emphasize the development of skills relevant to the labor market—such as TVE.[10] Moreover, since employers are, in principle, more willing to invest in firm-specific rather than generic skills, there is an a priori case for promoting TVE in public education systems as a way of supporting productivity and competitiveness. These arguments reflect the experience of European countries such as Austria, Denmark, Switzerland, and Germany, which follow a dual system of combining school-based education with workplace training (Eichhorst et al. 2015). Other countries, such as the United Kingdom and France have also developed solid TVE systems, with an emphasis on the certification of skills.

Nonetheless, during the past decades, the share of TVE enrollments has fallen even among European countries with the longest tradition in the sector. One important reason is the scarcity of evidence about the impact of different TVE models on labor market outcomes (OECD 2010). As discussed by Wang (2012), even the most developed TVE European models appear to be facing a modernization crisis. This crisis is due in part to the younger generation aspiring to high-skilled white-collar jobs (undermining the argument for TVE demand advanced earlier). According to OECD (2004), even in Austria, Belgium, Germany, and Switzerland—countries with well-developed TVE—only between 12 and 17 percent of young adults aspire to the skilled, blue-collar jobs typically associated with TVE. Compared to the academic track, which is identified as a better pathway to higher education (HE), TVE is increasingly viewed as a lower quality and less desirable option.

Recent data from Mexico[11] indicate that only 5 percent of parents aspire for their children to participate in TVE. Equally revealing of those aspirations is the fact that only a minority of graduates from lower secondary education identifies TVE options as the first choice for entering USE. Similarly, data from the Metropolitan Commission of Public Upper Secondary Education Institutions of Mexico (COMIPEMS)[12] shows that only 35 percent of lower secondary education graduates select a TVE option as their first choice for USE, and almost 50 percent select TVE as their sixth or lower option.[13] In a country where less than half of those graduating from secondary education will go on to HE, it could be expected that TVE would, to a larger extent, be seen by youth and their parents as an attractive pathway for entering the labor market.

Figure III.2 suggests that low participation in TVE is widespread in Latin America. With a few exceptions (Paraguay and Chile), TVE represents less than 30 percent of total enrollment among those in USE. Among lower middle-income countries—such as Guatemala, Honduras, and Paraguay—the share of TVE enrollment is increasing, but among higher income countries

Figure III.2. Evolution of enrollment in TVE (as a share of enrollment in upper secondary education)



Source: Based on CEES (2005).

like Mexico or Colombia the share is either stable or declining. In Chile (not included in the figure), enrollment in TVE is relatively high (around 45 percent) and has been stable in the last decade (Centro de Estudios n.d.). On the other hand, in Argentina (also not included in the figure), enrollment is relatively low and stable as a share of the total, at around 15 percent (DINIECE 2013).

Interestingly, on average, TVE students in Latin America present better results in the PISA test than students from general USE. Students in vocational schools in Argentina, Chile, Colombia, Costa Rica, and Mexico achieve15 points more in PISA on average than those from general schools, whereas in OECD countries, students from general schools tend to perform better by 61 points (OECD 2014). Moreover, the PISA results show that vocational schools do a better job of educating students coming from disadvantaged backgrounds: students from low socioeconomic strata perform better in vocational schools than in general education schools, even after controlling for age and gender (OECD 2016). This finding, along with the relatively small percentage of students in TVE, suggests that there may be unexploited opportunities to enhance the skills of young entrants to the labor market.

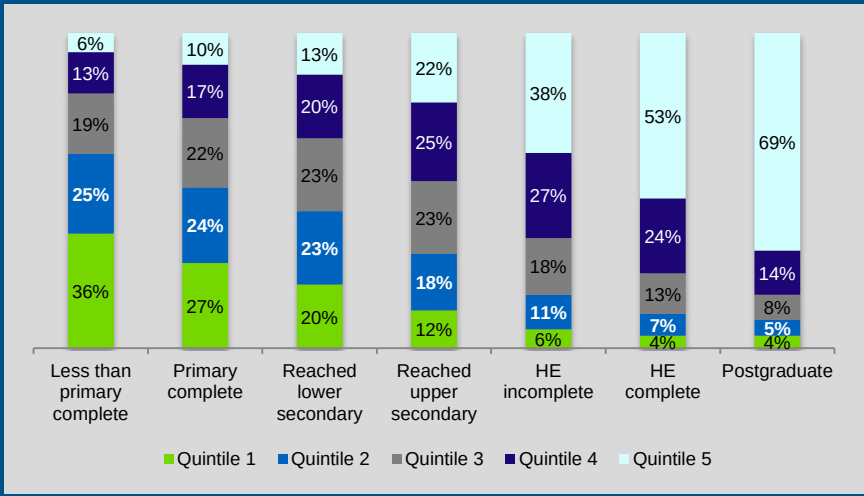
Overall, due to persistently high dropout rates, fast increasing enrollment in USE has not yet translated into equally large increases in graduation or skilled workers. As a result, countries in the region have not experienced as sharp a reduction in the size of the group of 'poor Latin American workers'.

B. Labor market outcomes

Returns to upper secondary education decline, whereas returns to technical and vocational education increase

How are individuals with secondary education faring in the labor market? Figure III.3 shows where adults with different levels of education fall along the income distribution. Individuals with USE are, to a great extent, part of the Latin American middle classes. Indeed, among those individuals with USE, only 30 percent are located in the lower two quintiles of the income distribution, whereas 47 percent are in the top two quintiles. The difference from those adults with only primary or lower secondary education is sharp (only 10 to 13 percent fall in the top income quintiles), as is that with those with HE.

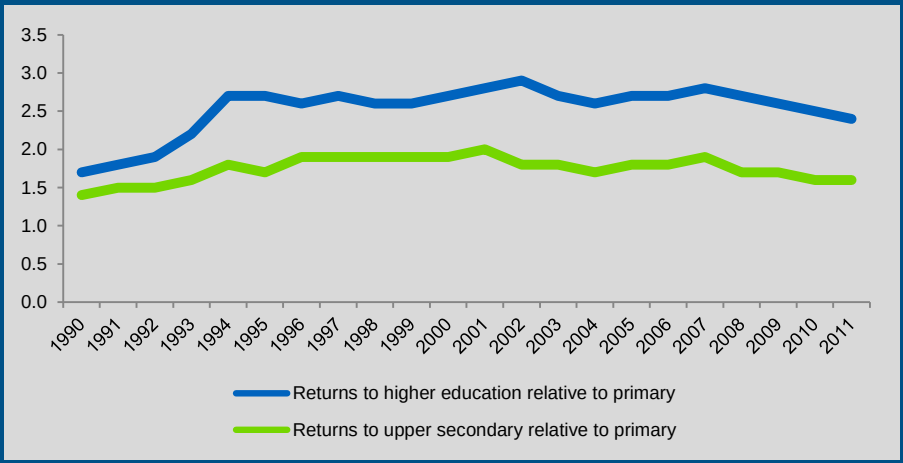
Figure III.3. Income distribution of working age population, by education level



Source: Székely (2015).
Note: Reached lower secondary includes individuals with both complete and incomplete lower secondary education but without any upper secondary education. Reached upper secondary includes individuals with both complete and incomplete upper secondary education but without any higher education.

Returns to USE have experienced a slight reduction compared to returns to primary education since the early 2000s (Figure III.4), reversing the pattern of sharp increases in the 1990s. This reversal has been identified previously in the literature (Aedo and Walker 2012; Bassi et al. 2013; Gasparini et al. 2011; and Manacorda et al. 2010).

Figure III.4. Relative returns to education in Latin America, 1990–2011

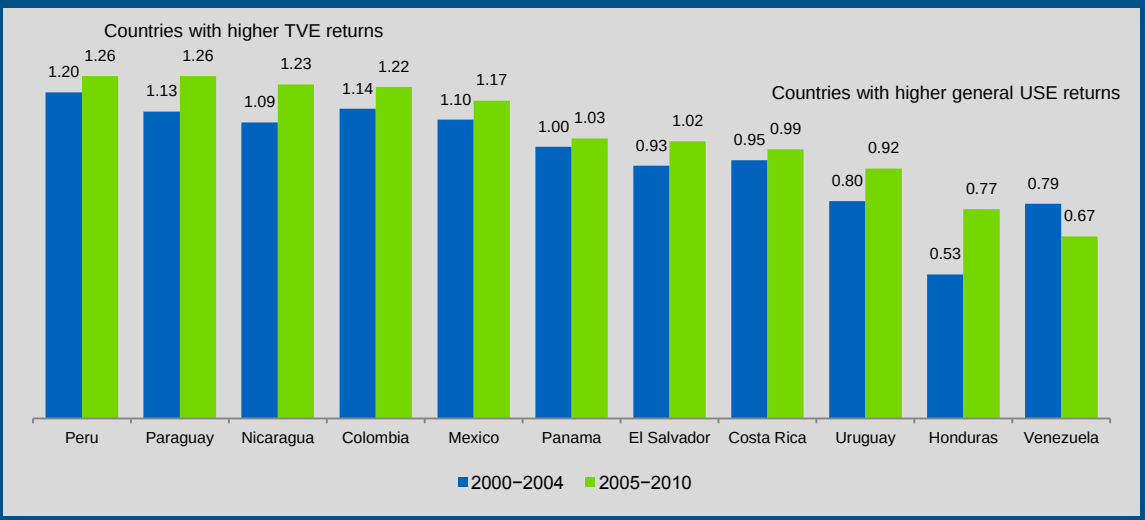


Source: Bentaouet-Kattan and Székely (2015).

Some of the explanations offered for the decline in schooling premium include the overall increase in the supply of workers with more years of schooling and the entry into the labor force of lower-ability individuals who experienced low quality schooling during a period in which access to lower secondary education expanded very quickly under less than optimal conditions. Furthermore, this change in the composition of the labor force happened during a period in which the increased demand and prices for commodities in world markets reduced the relative demand for higher skills in Latin America, with a consequent decline in their premium (Gasparini et al. 2011).

Figure III.5 shows that in a majority of Latin American countries, returns to TVE are higher than for general academic USE and/or are increasing over time. Venezuela is the only country included in the figure for which relative returns to TVE have fallen.

Figure III.5. Returns to TVE relative to general USE



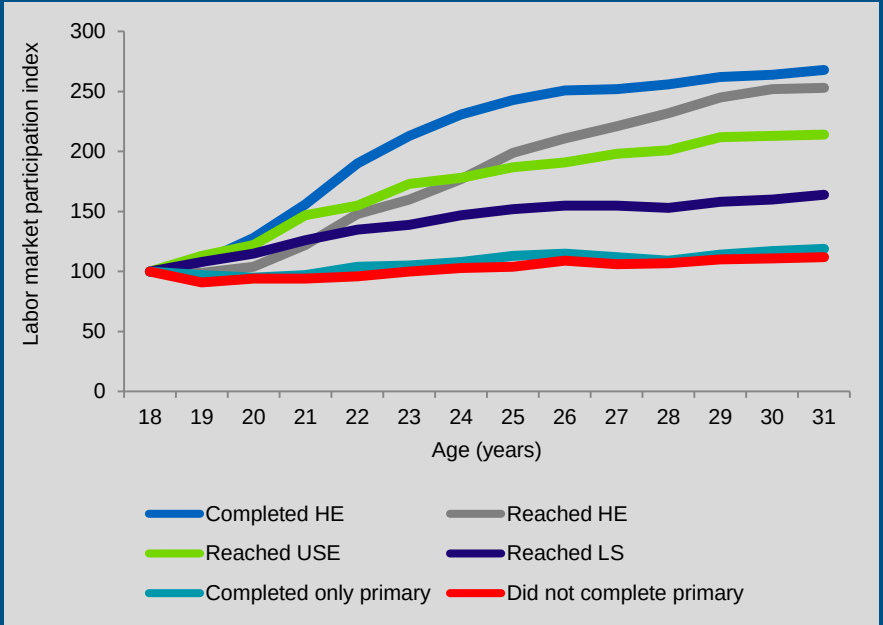
Source: Based on CEES (2015).
Notes: The figure uses data from IYF (2015) obtained by dividing the coefficient estimates of returns to schooling to TVE over the coefficient obtained for returns to general education. The returns are calculated through a standard Mincer regression with sample selection correction for people 24–55 years who are in the labor market.

The overall trend toward higher economic rewards to graduates from TVE relative to general USE has also been observed by Reis (2012) in the case of Brazil and Vélez-Grajales and Sedlacek (2010) in the case of Mexico. Similarly, based on data for 13 countries, Bassi and Ñopo (2015) concluded that wages are generally 5–10 percent higher for TVE graduates. The case of Chile appears, perhaps, as an exception. Bucarey and Urzúa (2013) traced labor market outcomes by identifying the school of origin of USE graduates between 2007 and 2011. They found that those who followed the TVE track generally earn lower wages than graduates who followed the academic track[14]. It should be noted that all of these are estimates of private returns that do not consider differences in public costs between the different tracks.

Labor force participation (formal and informal) is strongly associated with educational attainment

The probabilities of working are strongly related to educational attainment (Figure III.6). Labor force participation rates among those with at least some USE doubles between ages 18 to 31, whereas it increases by only 50 percent for those with only lower secondary education and remains stable for those with the lowest levels of schooling. The gap between those with USE and some HE grows sharply after the age of 24, suggesting that engaging in economic activity at a younger age might provide an early start, but this advantage vanishes once better educated individuals have enough time to search for labor market options and gain experience.

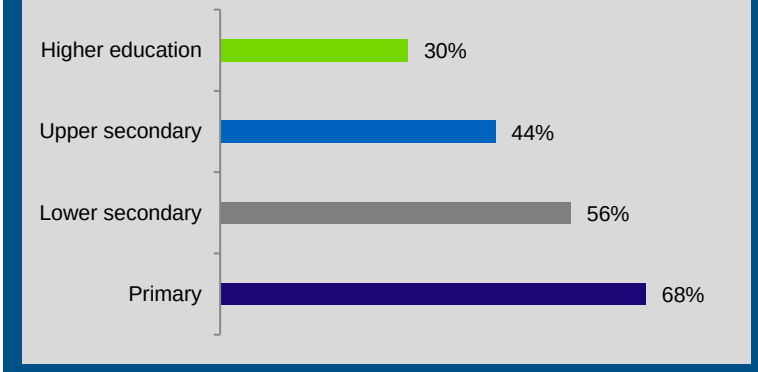
Figure III.6. Labor market participation, by educational attainment (individuals born in 1982)



Source: Székely (2015).
Notes: HE=higher education, USE=upper secondary education, LS=lower secondary education.

Moreover, having more education is closely associated with having better jobs. On average, 68 percent of those adults with incomplete primary education (the 'poor Latin American worker') work in the informal sector. The same share is 44 percent for those with USE (Figure III.7). The pattern of increasing work in the formal sector being associated with more education is remarkably similar across countries (data not shown).

Figure III.7. Share of informal sector employment, by highest level of education attained (2012)



Source: Székely (2015).

There is limited evidence regarding employment among graduates from general academic USE versus TVE, and the evidence available suggests that there is variation across countries. In Mexico,[15] TVE graduates have lower employment rates: 44 percent of recent graduates from general academic USE have been able to find a job, compared to 35 percent of those completing the technical and professional tracks. In contrast, TVE graduates tend to perform better both in Argentina and Chile. In Argentina, 48.8 percent of TVE graduates were employed and only 6.7 percent were neither working nor studying, compared to 33.4 percent and 17.2 percent, respectively, of general USE graduates (Martínez Mendoza et al. 2013). In Chile, TVE graduates tend to have more months of employment in a given year than graduates from general secondary, although their annual salaries are lower (Bucarey and Urzúa 2013).

Overall, although strong evidence exists indicating that obtaining USE education improves labor market outcomes relative to those with only lower secondary or less education, the effects of completing different tracks of USE are much less clear.

C. Challenges to the upper secondary education systems

USE systems in Latin America face the challenge of developing new sets of skills and knowledge, and different approaches to teaching and learning. The so-called 21st century skills refer to a broad set of knowledge, attitudes, habits, and abilities that are needed to succeed in a modern economy. More specifically, the OECD (2012) highlights the importance of reorienting secondary education by focusing on the set of higher-order 21st-century skills that includes creativity, critical thinking, communication, and collaboration (the 4 Cs). The 4 Cs are broken down into subcategories that include citizenship values, community identity, behavior, attitudes, values, and life-long learning habits, among others. The development of many of these skills concentrates on those ages 13–18, coinciding with the stage at which youth and adolescents are expected to attend lower and upper secondary schooling (Bassi et al. 2012).

At the turn of the 21st century, a global trend emerged in approaches to USE. The trend marked a turn away from models emphasizing memorization and the transmission of information and models centered on the acquisition of specialized technical skills toward competency-based approaches and systems promoting a diversified set of cognitive and non-cognitive skills. Latin America slowly is

seeking to move in this direction through competency-based education and certification of skills acquired.

Competency-based education emerges as an approach to build 21st century skills

The competency-based educational models for USE seek to develop general abilities, such as learning to learn throughout one's life (or life-long learning), equipping students with tools for applying knowledge practically, and generating the capacity to adapt continuously to change, rather than transmitting facts and knowledge from teacher to student, as in the past (see Box III.1). Competencies pursued in the education system should include "the ability to use cognitive resources to face a real-life situation satisfactorily" (Perrenoud 2004). In this view, competencies are the capacities to mobilize knowledge and abilities toward a specific goal. Their implementation requires complex mental processes, which enable individuals to judge consciously and execute a specific action efficiently in a particular circumstance.

Box III.1. Objectives of competency-based models according to the United Nations Educational, Scientific and Cultural Organization (UNESCO)

UNESCO's "Shared Foundations and Articulation" model defines the objectives of a competency-based model, as one that generates:

1. Strong social skills that enable individuals to conduct themselves responsibly in the community, particularly without gender or ethnic bias
2. Strong life-long learning (learning to learn) skills
3. Knowledge and behavioral skills to protect against diseases and substance abuse
4. Understanding the nature and purpose of general education so that mobility through technical and vocational education options can take place
5. Satisfactory levels of attainment among all learners in essential generic competencies, such as languages, mathematics, sciences, technology, and civics
6. Knowledge of cross-cutting areas, such as computer literacy, entrepreneurship, and environmental issues
7. A better state of preparedness for HE
8. A better state of preparedness for the choice of a vocational orientation and entering the world of work, and an orientation to occupations and employment among all beneficiaries of secondary-level education

Source: UNESCO (2005).

More advanced education systems, such as those in Australia, the United Kingdom, Ireland, and Scotland, have already adapted their USE systems along the lines of the competency-based model; the development of specific competencies and skills are defined officially as the goal of these education systems (OECD 2010).

Some Latin American countries have also developed competency-based approaches to USE since the 1990s (Brazil, Chile, Colombia, and Mexico). The main element in common in these cases is the definition of a competencies-based graduation profile, which establishes the abilities that youth are expected to possess when graduating from USE. The graduation profile is the element around which transformations in other dimensions take place, including teacher training, the redesign of materials and content, investments in technology, and school management, among others.

In Mexico, for example, USE was restructured in 2008 around 3 types of competencies: 11 generic, 44 disciplinary, and more than 50 professional. The generic ones includes the set of 21st century skills[16], whereas disciplinary skills are organized as a set of 12 literacy/communications skills, 8 numeracy skills, and 24 science competencies. The professional category corresponds to technical and vocational elements with a set of specialized options. After the reform, the country has seen 10 percent of its educational establishments fulfill basic quality norms, 70 percent of teachers trained, an expansion in coverage from 55 to almost 70 percent of youth of USE-eligible ages now incorporated into the system, and an average improvement in test scores on standardized tests (Székely 2014). Moreover, graduating from a school where the reform has been implemented is associated with greater chances of finding a job in the labor market, although no significant effect on wages has been observed (Székely 2014).

A curricular reform in 1999 in Brazil also included competencies, skills, and behaviors. In 2009, this reform was deepened through the Programa de Ensino Médio Innovador, which encouraged the development of innovative curricular proposals and focused on an interdisciplinary articulation of knowledge, competencies, practices, and values (De Hoyos and Villaseñor 2013). After the reform was initiated in Brazil, a 70 percent increase in USE enrollment occurred, the majority of teachers have been able to graduate from HE, and most teachers have had specific training to adapt their practices to the new model (De Hoyos and Villaseñor 2013).

In Chile, between 1998 and 2002, the upper secondary system was reformed to include competency-based curricula. It also was restructured by establishing two years of general education and two years of specific studies (either technical/vocational or scientific/humanistic tracks). After the reforms, school dropout has declined substantially (De Hoyos and Villaseñor 2013). As a result of the reform effort in Chile, the number of teaching hours has increased significantly; 98 percent of USE schools now offer TVE alternatives as an option; 90 percent of teachers have been trained in the new model; specialized agencies have been created for supporting the process of enhancing school quality; and a set of norms has been established that specifies the quality standards all schools must use. These reforms are correlated with positive changes in labor market outcomes, specifically in employment rates, average wages (which are between 5 and 15 percent higher for those transiting USE post reform) and, most important, in the income gap between students from lower and higher socioeconomic levels (Larrañaga et al. 2014).

Even though reform efforts in Brazil, Chile and Mexico are still ongoing, a number of common lessons have emerged from their implementation experience. They include the following, among others: (1) the strong requirements and time needed to develop the capacities of teachers to move away from a memorization and fact-based approach to a competency-based approach; (2) the significant financial resources needed for the transformation of such elements as content, materials, technology, and infrastructure; (3) the need to combine the leading role of a central authority with the participation of agents at the local level; and (4) the importance of combining increasing school autonomy with the proper support and guidance from education authorities. Also, implementing

competency-based approaches implies that student evaluation practices must move away from the fact-based periodic measurement to a system of continuous constructive assessment.

Overall, the complexity of these reform efforts demands that authorities work with all relevant agents and manage expectations because reform takes time (normally more than a decade) to be implemented fully and yield some visible results.

Certification of skills is pursued as a strategy to facilitate entry into the labor market

A critical element needed for education systems to increase their economic relevance is having access to information on the skills and competencies demanded by the productive sector. The certification of skills is an emerging model in Latin America that presents a promising way of bridging the gap between the education system and the labor market.

Under this alternative—followed successfully by England and France (Székely 2014) among other countries—competencies are defined as verifiable standards specified by the private sector according to its needs. Students go through an evaluation process to verify that they have reached the desired competency levels and an official certificate is granted that is valid in both the education system and the labor market. The certification process has become the signaling mechanism by which educational content is adapted to the human resources requirements of the economy.

Argentina,[17] Chile, Colombia, and Mexico are some of the countries that have followed this path in Latin America. Its implementation has required the creation of certification agencies and institutions that play a role in coordinating between the education and productive sectors (Székely 2014).

The available information suggests that Mexico and Chile have the two most advanced models. The certification model that Mexico follows is centered on the National Council for Certification of Labor Competencies (CONOCER), which promotes and coordinates the National System of Competencies (Sistema Nacional de Competencias). Labor market standards, evaluation criteria, and certification procedures are coordinated with representatives of different production sectors, with the objective of ensuring that the standards correspond to real demands from the economy. The CONOCER also includes a registry of institutions certified for developing standards and evaluation processes. Its governing body includes the Ministries of Education and Labor and several business sector and union representatives. The agency also provides technical assistance to firms and public entities so they can set up their own management committees (Comités de Gestión por Competencias) for defining competency-based standards and certification procedures.[18] A central element of the USE reform in Mexico is that the professional skills defined as part of the exit profile of students are aligned to official certifiable CONOCER standards, which then are used as references, especially for defining the TVE curriculum. A recent analysis of this scheme suggests that although the design has strong and well-focused components, the implementation so far has not been satisfactory due to the low priority given to its execution in national education policy.

In Chile, Chile Valora, created in 2008, is responsible for managing and coordinating the National System for Labor Competencies Certification (Sistema Nacional de Certificación de Competencias Laborales). The institution works jointly with the Sectorial Organizations of Labor Competencies (Organismos Sectoriales de Competencias Laborales), which identify key occupational profiles, and with Evaluation and Certification Centers (Centros de Evaluación y Certificación), which evaluate and certify workers' competencies. The governing body of Chile Valora also comprises several

actors, including business sector representatives, workers' organizations, and agencies from the education and labor ministries. USE and HE institutions commonly use the skills defined by the productive sector within Chile Valora as the reference for defining their contents. The result is that youth who graduate from these levels and follow a TVE usually exit with skills relevant for finding local employment opportunities. A qualitative study that interviewed employers, workers, evaluators, and certification centers found that awareness of the program is limited among employers and workers, and a lack of knowledge is a barrier for participating in Chile Valora (Cadem 2015).

D. Concluding remarks

Overall, efforts to reform USE by changing its orientation and responsiveness to labor market demands have not yet resulted in the type of transformation Latin American countries need and aspire to. At the same time, and in spite of the limitations of USE, these ongoing reforms delineate potential paths for the future.

Combining competency-based education, skills diversification, and certification into a unified reform effort could generate strong synergies. For example, defining a competency-based graduation profile from USE jointly based on a wider set of skills and with recognition from the labor market based on certifications could significantly improve USE relevance and quality.

USE reform cannot be separated from broader efforts to improve the quality of education in Latin America, however. Education is a continuous process, in which current outcomes observed in USE are also shaped strongly by the full education cycle, starting at the early ages of entry into the system. Unfortunately, few shortcuts exist to provide young Latin Americans with high quality and relevant USE that do not involve systemic improvements in basic education. In other words, the full payoff of USE reforms will not be felt until the quality of basic education is also improved.

IV. TERTIARY EDUCATION AND SKILLS DEVELOPMENT

As growing numbers of Latin American high school graduates seek higher levels of education, tertiary educational institutions[19] are pressed to respond to a wide range of expectations from stakeholders, from supporting social mobility to meeting the demands of an ever-changing labor market. In this chapter, we consider the extent to which tertiary education systems in Latin America are responding to those expectations, and we discuss the main challenges they face and approaches being followed as they work to improve their quality and relevance.

A. Participation in tertiary education

Participation in higher education increases steadily over time

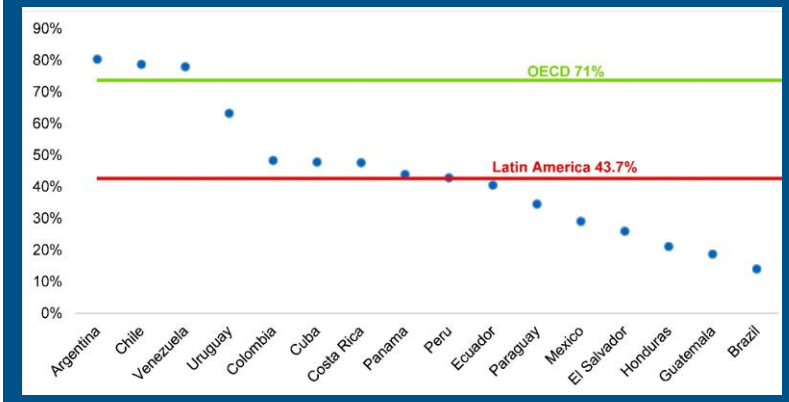
Although they still lag behind the performance of the world's top economies, participation in tertiary education has increased significantly in Latin America over the past decades, reflecting strong and growing demand. By 2013, more than 24 million students were pursuing some form of tertiary education in the region, a striking increase from about 10 million in the year 2000 (Brunner and Villalobos 2014).

Growth in enrollment was rapid between 1970 and 1980, with an average annual rate of 11 percent. In that period the gross enrollment ratio (GER)[20] rose from 7 to 41 percent on average across the region. Since 2000, enrollment levels have accelerated again, with an average annual rate of growth of 6.8 percent.

As Latin American countries succeed in increasing enrollment in and graduation from secondary school (discussed in Chapter II), a larger share of their youth will seek (and expect to participate in) tertiary education. Trow (2010) developed a useful typology to categorize educational systems as they respond to such increases in demand. He defined systems as "elite" when their gross enrollment ratio (GER) is below 15 percent, "mass" when GER is between 16 and 50 percent, and "universal" when GER is more than 50 percent.

Only in a handful of countries—Brazil, Guatemala, Honduras—does access to tertiary education remain a privilege of the elite. Having reached GERs of at least 60 percent, Argentina, Chile, Venezuela, and Uruguay (Figure IV.1) are in the path to universal access to tertiary education, whereas most other Latin American countries are still going through a "massification" phase, with GERs between 25 and 50 percent.

Figure IV.1. Gross enrollment ratios in tertiary education (circa 2013)

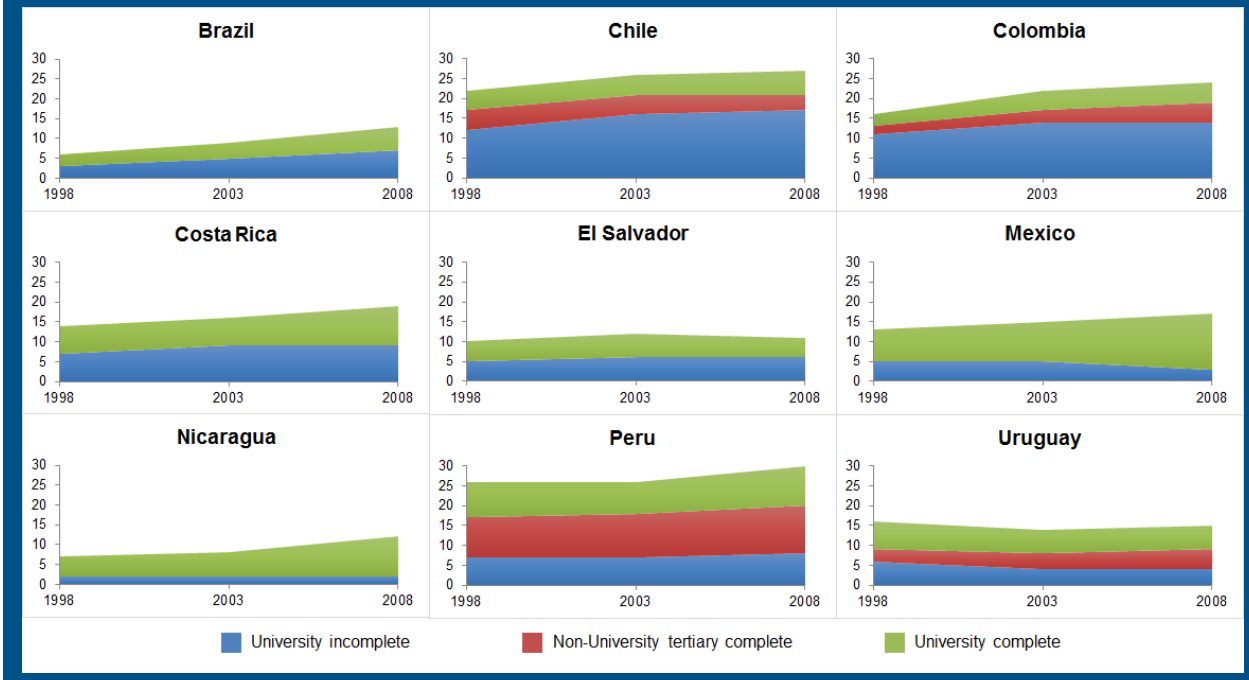


Sources: UNESCO, ECLAC (2015).
Notes: Enrollment in ISCED levels 5A, 5B, and 6.

Massification is due to several forces, including (1) rising enrollment and graduation rates in USE; (2) increasing public financial support in the form of scholarships and loan schemes; (3) expanding supply in the form of new private and/or public tertiary institutions that offer university and non-university degree programs, and (4) diminishing barriers to entry, as many of the institutions offering tertiary education opportunities do not select students on academic grounds.

Expanded access to tertiary education has, overall, led to an improvement in the educational attainment of the workforce throughout the region (Figure IV.2). The expansion in the share of individuals with at least some tertiary education (a group we have characterized as the 'modern Latin American worker') has been particularly rapid in Brazil and Mexico. Among countries for which these data are available, only Uruguay has a rather flat trajectory.

Figure IV.2. Percentage of 25- to 35-year-old non-students that complete university



Source: Data from Aedo and Walker (2012).

Low retention and graduation rates signal important system inefficiencies

Although participation and attainment levels have improved, retention and graduation rates remain low, suggesting internal inefficiencies in the tertiary education sector. In 2005, the region had a dropout rate of 57 percent on average (González Fiegehen 2005) and, in more recent years, the situation has not improved much. As shown in Table IV.1, university graduation rates (as a proportion of incoming students) in Latin America are well below those in higher income countries.

Table IV.1. University completion in selected countries

Countries	Completion per 100 incoming students
Japan, Denmark	≥ 80
United Kingdom, Russia, Germany, Canada, Australia, Finland, Belgium, Netherlands, Portugal, Switzerland, Slovakia	≥ 70 and < 80
Czech Republic, Sweden, Norway, France, Iceland, Poland, Slovenia, **Mexico**, **Peru**	≥ 60 and < 70
United States, Hungary, New Zealand, **Brazil**, **Chile**, **Nicaragua**, **Paraguay**, **Ecuador**	≥ 50 and < 60
Argentina, **Colombia**, **Costa Rica**, **El Salvador**, **Panama**, **Uruguay**	≥ 40 and < 50
Bolivia, **Honduras**	≥ 30 and < 40

Source: Adapted from CEA (2015) and World Bank data based on SEDLAC 2012 (in Ferreyra 2016).

There is limited recent evidence on the reasons for these low graduation rates in Latin America, although we know several factors contribute to this problem (González Fiegehen 2005). Some have to do with students' socioeconomic background (such as coming from low income families or needing to work) and personal characteristics (such as low levels of motivation, inadequate emotional maturity, and poor time management and study habits). Other factors are institutional (such as lack of funding for financial aid and admission policies) or academic (such as lack of support and orientation from professors, and lengthy programs of study).

For example, in Colombia, a recent quantitative study revealed that student characteristics make a difference in completion rates. The study found that (1) dropout rates are higher for men than for women (and the difference widens with each passing semester), (2) the lower the household income, the higher the dropout rates, and (3) students who are not well-prepared (as demonstrated by their low scores in the SABER 11 standardized tests taken by graduating high-school students) or who work while attending school are more likely to drop out (Universidad de Los Andes 2014).

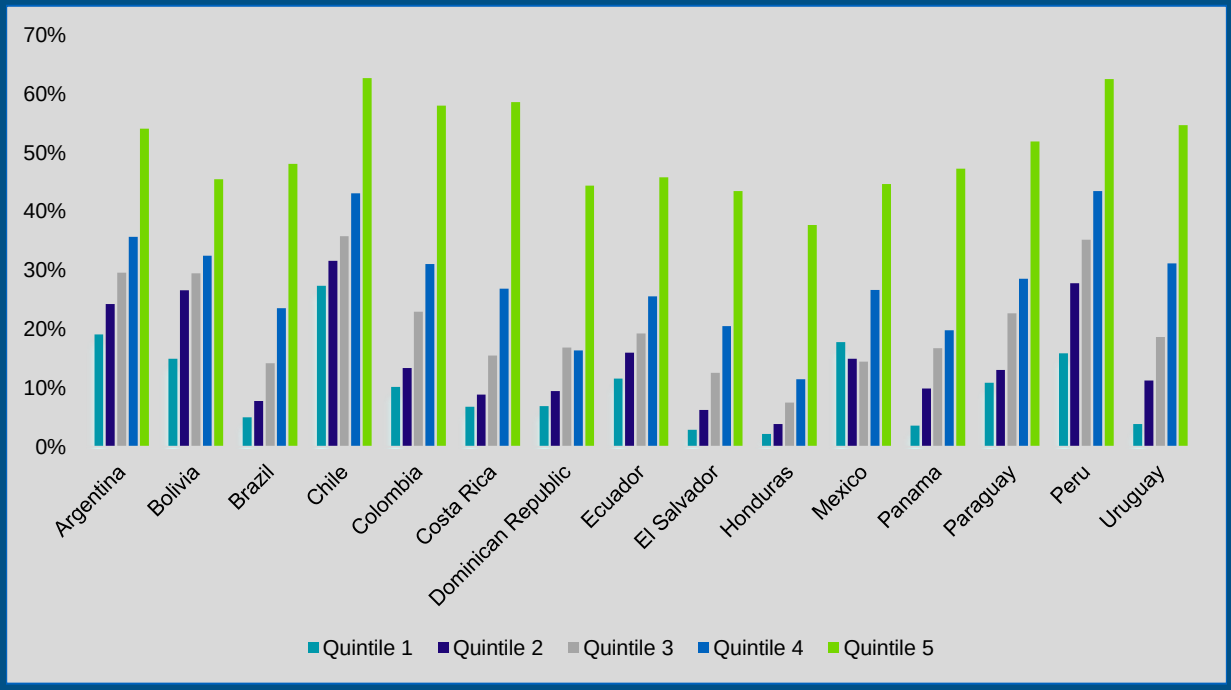
Evidence from Colombia also sheds light on the academic and institutional factors that could cause a student to drop out. Having to retake a course increases the risk of dropping out, and this factor has a larger effect for technical institutions' students. This suggests that when students struggle with their studies, this struggle persists over time. Also, some fields of study are associated with higher dropout rates—namely, education (among students in technical/professional institutions), and mathematics and natural sciences (among university students). In general, technical education students are more likely to drop out than university students are, and receipt of financial aid decreases the risk of dropping out (Universidad de Los Andes 2014).

Admission requirements also play a role. In Argentina, where admission to public universities is not selective, one explanation for the low graduation rates is the poor preparation of students that enter the higher education system (CEA 2015). In contrast, students in other countries such as Brazil and Chile are required to take examinations at the end of the secondary cycle, and having to prepare for those exams may raise their preparation for the higher education system.

Although Latin American countries have made progress in broadening access to tertiary education, in most countries this opportunity has not been equitably realized in all income groups. In Chile, a country that has quadrupled participation rates in tertiary education over the last few decades, only

27 percent of the potential students whose family incomes are in the lowest quintile participate in some form of tertiary education, compared with nearly 63 percent of those whose family incomes are in the top quintile (Figure IV.3). In El Salvador, Honduras and Uruguay, students from families in the highest income quintile are approximately 15 times more likely to enter tertiary education than are students whose families are in the lowest income quintile (CINDA 2011b).

Figure IV.3. Net enrollment rates by income quintile (circa 2013)



Source: SEDLAC/The World Bank.
Note: Net enrollment rates are the proportion of the college-age population that is effectively attending college.

Recent data also show that students whose families have incomes in the highest quintile have graduation rates above 50 percent, while students whose family incomes are in the lowest two quintiles have graduation rates below 40 percent (Ferreyra 2016). Combined with the large differences in enrollment rates, this indicates that, in spite of the progress made, equity remains a serious challenge for tertiary education systems.

B. A diversified tertiary education sector

Tertiary education experiences fast expansion (in number of institutions and students) often driven by the private sector

There are over 10,000 tertiary education institutions in Latin America with a total enrollment of more than 24 million students (Brunner and Villalobos 2014).

Table IV.2. Tertiary educational institutions

Country	Universities	Non-universities
Argentina	115	2,092
Bolivia	85	313
Brazil	186	2,128
Chile	60	117
Panama	11	39
Paraguay	87	166
Peru	100	1,120
Venezuela	58	112
Colombia	281	93
Costa Rica	56	24
Mexico	2,573	19
Dominican Republic	33	13
Uruguay	15	13
Cuba	67	---
Guatemala	13	---
Honduras	20	---
Nicaragua	54	---
Total	**3,815**	**6,249**

Key: Countries with more non-university institutions than universities
Countries with more universities than non-universities
Countries with missing data

Source: Brunner and Villalobos (2014).

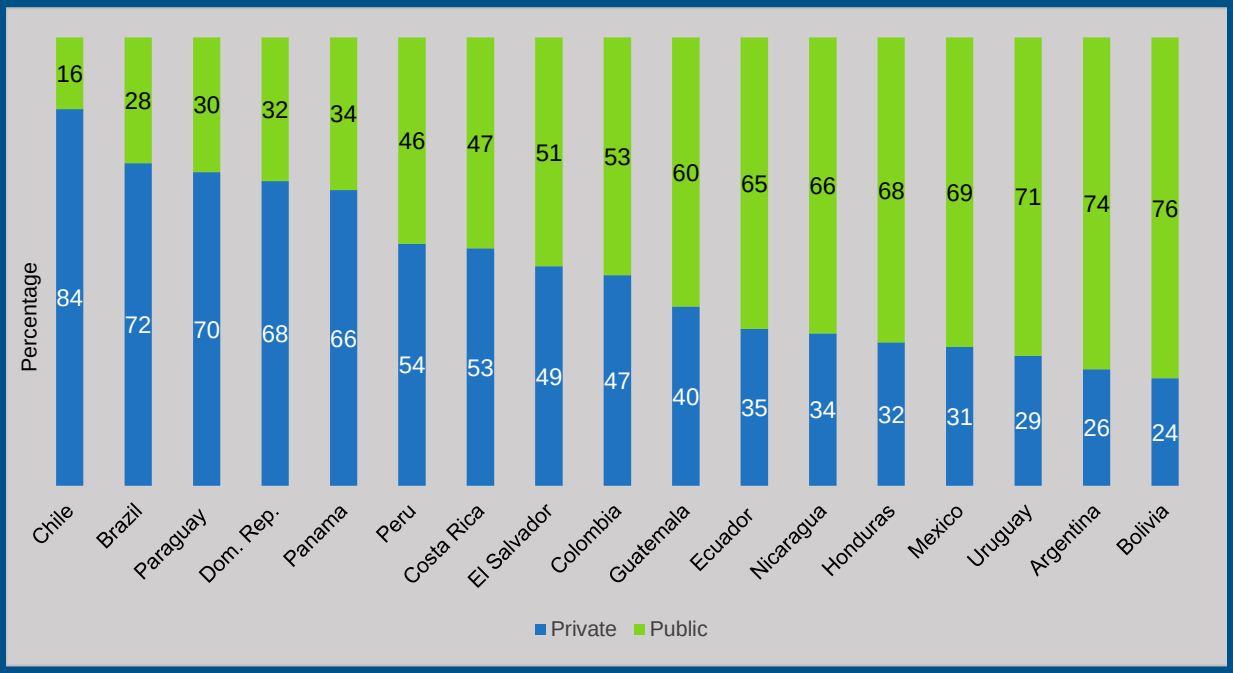
Over time, the composition of the tertiary education sector has changed sharply—from the traditional public research university to a set of institutions that vary widely in terms of their mission, governance structure, funding sources, type of programs offered, modes of delivery, student population, and other characteristics. In most countries in the region for which we have data, these institutions now include a small number of universities (20 or less in Guatemala, Honduras, Panama, and Uruguay) and a large number of non-universities (over 2,000 in Argentina and Brazil) that offer shorter programs of study focused on vocational or technical education (Table IV.2).

A striking feature of Latin America's tertiary education system as it has evolved over the last few decades is the large (and growing) number of private institutions. Almost two-thirds of universities in the region are private, and they account for nearly half (48.2 percent) of the region's total enrollment in tertiary education, a much higher share than in other regions of the world (Brunner and Villalobos 2014). Indeed, the share of private enrollment is 36 percent for Asia and 16 percent for Europe, by comparison (Levy 2013). These average figures are somewhat misleading, as Figure IV.4 reveals the differences between Latin American countries on this measure, with some countries having more than 70 percent of tertiary enrollment concentrated in private institutions (Chile, Brazil, and Paraguay), whereas in others (Uruguay, Argentina, and Bolivia), similar or even larger proportions of students are enrolled in public institutions.

These differences reflect the varying strategies that different countries use to meet the increasing demand for tertiary education. Some countries, like Cuba and Venezuela, expanded and diversified their public universities. Others allowed or even fostered the expansion of private alternatives, perhaps as a cheaper and faster way to respond to the increasing demand for access to tertiary

education. Private-sector expansion was so drastic that, by 2009, only Brazil, Cuba, and Venezuela had more public institutions than private ones (Brunner and Ferrada 2011).

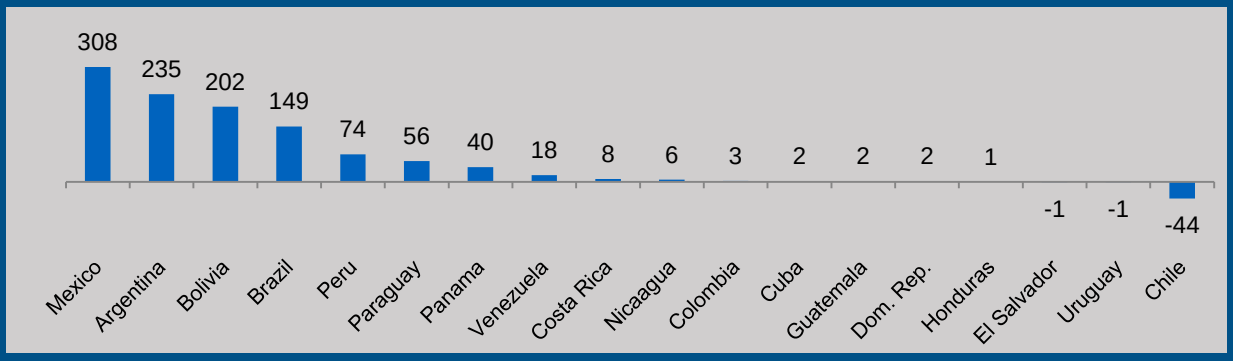
Figure IV.4. Distribution of enrollment in public and private tertiary institutions, 2012



Source: Brunner and Villalobos (2014).

Between 2005 and 2010, more than 1,000 new institutions were created in the region (Figure IV.5), and most of them were private and did not depend on public funds (Brunner and Ferrada 2011). In a few countries (Mexico, Argentina, Bolivia, and, to a lesser extent Brazil) there was a particularly widespread expansion, while other countries consolidated their systems without creating many more institutions (Colombia, Cuba, Guatemala, Dominican Republic, Honduras, El Salvador, and Uruguay) or even decreasing the number of institutions (as in the case of Chile or Ecuador; Ecuador is not in the figure).

Figure IV.5. Changes in the number of tertiary education institutions (Selected countries, 2005–2009/2010)



Source: Brunner and Ferrada (2011).

Growth in the non-university sector expands access to students from lower socioeconomic backgrounds pursuing technical/vocational education

The non-university sector appears to have played a critical role in the expansion of tertiary education, particularly by allowing the incorporation of students from families whose incomes are in the lower quintiles (Brunner and Ferrada 2011). This process has been welcomed as an appropriate answer to the growing diversity of students' socioeconomic and academic backgrounds and their learning needs (Teichler 2008). To meet their needs, a wider range of post-secondary technical/vocational programs are now being provided by both public and private institutions (Box IV.1), with some of them oriented to specific kinds of occupations, whereas others serve tens of thousands of students with diverse offerings.

Some of the technical institutions were conceived as terminal options, as they provide certificates that help people obtain entry-level jobs. In other cases, technical institutions are conceived of as a bridge toward university degrees—particularly, but not limited to, engineering and other STEM fields. In all cases, technical education implies a move away from university education in terms of both program content and modes of delivery (Jacinto and García de Fanelli 2014; Araneda 2014).

Box IV.1. Technical tertiary institutions: A diversified system across the region

Brazil. There are four types of technical educational institutions at the tertiary level: (1) public colleges and institutes, (2) training institutions owned and managed by specific industry associations (the Serviço Nacional de Aprendizagem Industrial (SENAI), for example, serves manufacturing and technology-based businesses; the Serviço Nacional de Aprendizagem Rural (SENAR) serves the rural industries; and the Serviço Nacional de Aprendizagem Comercial (SENAC) serves commerce), (3) technological institutions that form part of a federal network, and (4) private technical schools that offer industry-based courses without requiring formal educational qualifications. Student enrollment in tertiary technical education in Brazil increased sevenfold between 2001 and 2010.

Chile. Tertiary education comprises three types of institutions that are regulated by formal education authorities and allowed to provide tertiary technical education: universities, professional institutes, and technical education centers may award technical qualifications, but only universities may award academic degrees. Technical education accounts for 56 percent of total enrollment in the first year of tertiary education. This trend was partly the outcome of new scholarships and loan schemes for which technical students and institutions were previously ineligible.

Colombia. Tertiary technical education is provided by technological and technical institutions that account for 32 percent of enrollment in tertiary education. In addition, there is a major public institution reporting to the Ministry of Labor, called the Servicio Nacional de Aprendizaje (SENA), which has traditionally been in charge of short-term courses linked to entry level employment; it also offers long-term programs, and these recently became eligible to award formal education qualifications at the tertiary level. SENA operates as a network across the country and also accredits smaller, company-based training providers.

Mexico. Technological universities and public polytechnics complement the academic orientation of universities with technology-driven education. Some state and private universities also offer the qualification of Técnico Superior Universitario (a higher technical university degree). Though tertiary technical education accounts for only 3.2 percent of total enrollment, the number of students quadrupled between 1998 and 2008.

Mexico and Brazil have attempted in recent years to strengthen their tertiary education systems by emphasizing technological education and short-cycle programs in order to serve a more diverse student body. However, the institutions focusing on these types of programs have generally been private, often for-profit companies that rely on student fees as their sole source of financing. For example, in Chile, tertiary technical institutions are not eligible for subsidies, their students have to compete for a relatively small number of scholarships and have access to a state-supported loan depends on the accreditation status of the institution in which they study.

C. Labor market outcomes

The rapid convergence of Latin America's participation levels for tertiary education with the levels seen in developed countries has not translated into a corresponding convergence in productivity or income levels (Crespi et al. 2014). This makes it important to consider labor market outcomes in assessing the performance of the tertiary education system.

Tertiary education credentials improve labor market outcomes

In Latin America, as elsewhere, having a tertiary education qualification makes a difference in the labor market, helping graduates to get jobs (mostly in the formal sector), obtain better benefits (such as higher salaries), and increase the probability of their participation in lifelong learning opportunities (ECLAC 2011; Chapter I).

Tertiary education graduates experience higher rates of employment and lower rates of unemployment than individuals with less education do. The average unemployment rate for female university graduates is about 5.9 percent, whereas those who only complete secondary education have an unemployment rate of 10.5 percent. The same trend is true for males: the unemployment rate is 4.5 percent for university graduates, 6.1 percent for secondary graduates, and 8.8 percent for those who did not complete secondary education (ECLAC 2010). Tertiary educational credentials seem to operate as a mechanism of social protection from employment in the informal economy (see Table IV.3), a sector characterized by low levels of productivity and earnings (Perry et al. 2007).

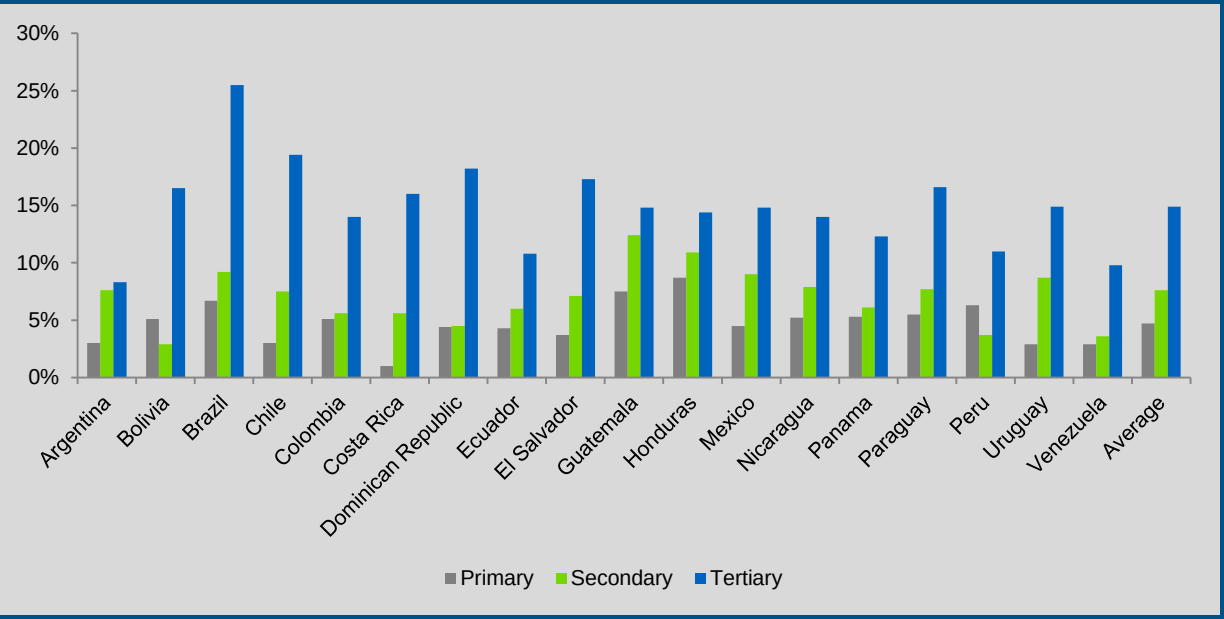
Table IV.3. Employment in the informal economy, by level of education (Percent of workers ages 15–29 in informal employment)

	Completed secondary	Incomplete tertiary	Completed tertiary
Argentina	39.2	26.3	13.0
Bolivia	66.7	38.9	7.6
Brazil	16.6	8.3	8.0
Chile	19.5	12.8	4.2
Colombia	62.0	34.6	15.5
Costa Rica	25.0	10.0	4.2
Dominican Republic	43.1	22.7	0.6
Ecuador	52.2	31.1	15.8
El Salvador	30.6	22.3	9.1
Guatemala	28.3	15.6	9.6
Honduras	40.0	17.9	6.1
Mexico	35.5	22.8	10.1
Nicaragua	44.3	41.1	14.9
Panama	29.9	19.6	5.3
Paraguay	47.1	24.4	40.4
Peru	62.8	44.0	21.3
Uruguay	27.7	14.0	5.0
Venezuela	40.7	28.9	12.9
Latin America	27.7	20.2	11.7

Source: ECLAC (2010, Social Panorama Latin America).

Decreasing returns to tertiary education in some fields and programs reinforce the need to improve access to information to guide decision making and improve efficiency

Figure IV.6. Rates of returns to education, by education level



Source: ECLAC (2010).

In most countries, returns to tertiary education are at least twice those to secondary education (see Figure IV.6. However, earning premiums among university graduates in countries such as Brazil, Chile, Costa Rica, El Salvador, Mexico, Nicaragua, Peru and Uruguay have been decreasing. In countries where there is data available (Chile, Peru, and Uruguay), the same pattern is observed for non-university tertiary education, suggesting decreasing returns from both academic and technical programs.

This pattern is unlike the one observed in other regions of the world where wage premiums gained from tertiary education have risen in recent decades (OECD 2014), including in regions such as East Asia, were educational attainment has expanded even faster than Latin America and still report increasing earning premiums (Aedo and Walker 2012). Overall, this evidence suggests that Latin American countries have not succeeded in translating "quantitative expansion" into quality and relevant tertiary education (Balán 2013). It could be said that in Latin America higher education graduates are not viewed as "economically valuable" as they are in East Asia (Aedo and Walker 2012).

Growing enrollment in tertiary education may have resulted in an oversupply of skilled workers in some countries (Aedo and Walker 2012). This may be compounded by the fact that the expansion of tertiary education participation involved a significant number of students from poorer backgrounds and lower academic achievement, who have entered non-selective institutions of uncertain quality in large numbers (OECD 2014). As a result, the economic returns from tertiary education credentials may have fallen.

At the same time, the commodity sector's boom and the reduced share of employment in manufacturing in most countries in the region favored the growth in unskilled jobs and resulted in weakening relative demand for workers who have higher levels of education (Gasparini, Galiani, Cruces, and Acosta 2011; OECD 2014). Altogether, the expansion in the supply and the slowdown in the growth in demand for tertiary education graduates may have pushed wage premiums down.

Extremely low graduation rates (Table IV.1) can also harm non-completers' wages. In Chile, for example, the labor market "punishes" workers who, despite having participated in tertiary education, did not get their final diploma or certificate: this group exhibits similar labor market indicators to workers who have attained only upper secondary diplomas (Urzúa 2012). This is particularly worrisome, considering the group most affected by this issue is students from poorer backgrounds.

Moreover, there are signs of substantial variation by field of study when it comes to the returns realized by completing a tertiary degree program. Evidence from Chile, Colombia, and Peru shows large difference in returns between institutions, type of programs, and fields of study (González-Velosa et al. 2015; Espinoza and Urzúa 2015). Engineering and technology degrees tend to generate higher returns.[21] Variation can also be high within the same field. In Colombia, graduates from accounting programs (with both university and non-university degrees) can experience either positive or negative returns depending on the institution they attended. Also in Colombia, 30 percent of university graduates and 59 percent of graduates from technical programs had negative returns. In Chile, the same proportions are 22 percent and 51 percent, respectively. Graduates from private institutions in Peru have larger returns in all fields of study, for both university and technical education programs (Espinoza and Urzúa 2015).

The evidence on how well graduates from tertiary technical programs do in the labor market is mixed. Jacinto and García de Fanelli (2014) find that most tertiary education graduates in Brazil, Colombia, and Mexico do find employment in the formal sector, but they are paid considerably less than university graduates. In addition, their salaries tend to increase very slowly. On the other hand, when measured as return on investment, technical qualifications can be more valuable than university qualifications for certain areas of study. In Peru, health professionals from technical institutions have higher returns than university graduates (average returns of 31 percent and 7 percent, respectively) and this trend holds true in other areas—business and administration, and sciences, engineering, and manufacturing (Espinoza and Urzúa 2015). However, returns from university degrees are higher in areas such as social sciences/communications and arts/architecture. For example, in Chile, two-year technical programs in the arts have larger returns on investment compared with four-year technical programs and university degrees in the same field.

Overall, this complex picture of significant differences in returns suggests that better access to information on labor market performance for graduates in different fields and from different institutions could help individuals make more informed decisions and thus improve the efficiency of the tertiary education sector. This is particularly important for low-income students (González-Velosa et al. 2015). Acknowledging this possibility, several countries have established so-called labor observatories (Box IV.2).

Box IV.2. Labor observatories in Chile, Colombia, and Peru

The growing number and variety of tertiary educational institutions makes it increasingly difficult for students to navigate their educational and professional options and assess their expected return on investment for a given institution or career. Several countries in Latin America have built web platforms that serve as labor market observatories by providing detailed information about tertiary institutions, labor market sectors, and available careers.

Chile's Mi Futuro is a site run by the Ministry of Education primarily to serve future students by providing information on higher education and career opportunities. The site highlights key reasons for pursuing higher education, the importance of attending a high quality institution, and practical information on how to pursue higher education studies. Users can browse statistics on the projected employability and earnings for various careers and institutions, as well as information on accreditation, duration of study, percentage of students employed within a year of graduation, cost, and percentage of students who receive grants or other financial support.

Colombia's Graduados is run by the Ministry of Education in collaboration with other organizations and institutions. The site includes information on scholarship opportunities, post-graduate studies, labor market results, and labor rights and regulations for students and graduates. For higher education institutions, the site offers examples and case studies of how national and international higher education institutions are preparing students to enter the labor market. The site offers substantial information to firms in the productive sectors, including examples of how other firms have contributed to the development of human capital at a local and national level, as well as information on existing resources and networks for firms, entrepreneurial projects initiatives, and indices evaluating labor market competitiveness at a global, national, and departmental level.

Peru's Ponte en Carrera is an online platform run by the Ministry of Education for future students. The site provides a few key statistics, student testimonials, and a large number of user-friendly tools to help students identify areas of interest and potential educational opportunities. The site allows students to search for and compare information on higher education institutions (such as programs of studies, costs, selectivity, and other characteristics) by areas of interest, occupations, or location. In addition, the site acts as a virtual counselor, providing general information on why to continue studying, how to select a concentration, available career opportunities for students as they complete programs in various institutions, and how to select where to study.

D. Quality and relevance in tertiary education

Quality assurance mechanisms are established to regulate the expanding tertiary education sector

Most countries in Latin America have established or are in the process of establishing quality assurance mechanisms for their tertiary education systems (CINDA 2012). For the most part, the focus is on providing a public guarantee through program accreditation (voluntary in some countries), with quality assurance processes driven by the public sector. These processes rely primarily on institutions' self-assessment, which is validated by external evaluators (Box IV.3).

Box IV.3. Accreditation systems, actors, and practices

Many countries in Latin America have created **national agencies** that are responsible for developing and implementing quality frameworks to underpin accreditation of programs or institutions. These new bodies are varied in their origins and scope. Most accreditation bodies are governmental, such as those in Argentina, Chile, Colombia, and Ecuador. In some Central American countries, prestigious public universities oversee the process.

In other countries, there are **multiple institutions** that play a role in the quality assurance process. In Brazil, state and federal government bodies license and regulate institutions and degree programs, and two separate bodies are responsible for assessing quality standards: the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) at the graduate level and, since 2004, the National Higher Education Accreditation System, which has had the broader role of coordinating and implementing assessment and regulation procedures. In Argentina, Mexico, and Chile, the main national agency has the faculty of evaluating and licensing other agencies (public or private) that operate in the quality assurance process.

Regional accrediting bodies have also formed across Central and South America, and so have organizations that accredit programs in niche higher-education sectors. New groups that accredit medical education, engineering education, private education, agricultural education, and distance education have all begun the process of establishing their scope and influence in the regional system of quality assurance.

Source: CINDA (2012).

Only Argentina, Chile, and Colombia have licensing mechanisms to ensure compliance with minimum standards. In Argentina, the Comisión Nacional de Evaluación y Acreditación Universitaria (CONEAU) can authorize the establishment of new institutions based on the internal consistency and viability of the educational project they propose. This is also true in Chile, where the Consejo Nacional de Educación (CNED) licenses new private institutions based on quality requirements (and reevaluates all institutions every six years). In contrast, in Colombia, the Comisión Nacional de Aseguramiento de la Calidad de la Educación Superior (CONACES) does not authorize new institutions, but it does hold a record of institutions that comply with minimum quality conditions the country requires them to have in order to operate.

Quality assurance focuses on inputs and outputs, not learning outcomes or skills acquired

Very few quality control systems in Latin America use measures of learning outcomes to assess the performance of tertiary educational institutions (Table IV.4). The contrast with lower levels of the education system, where learning assessment systems are well established (Ferrer and Fiszbein 2015) is striking in that regard. This makes it difficult to know the extent to which graduates are equipped with the knowledge and skills they need to best navigate the labor market.

Table IV.4. Quality assurance systems in Latin America (selected countries, 2012)

	Type of agency				Methodology		
	Autonomous national agency	Government body	University	Private Institutions	Self-assessment	External evaluation/ verification	Learning outcomes
Argentina		✔			✔	✔	
Bolivia	✔	✔	✔		✔	✔	
Brazil		✔			✔	✔	✔
Chile	✔			✔	✔	✔	
Colombia		✔			✔	✔	✔
Costa Rica	✔		✔		✔	✔	
Ecuador		✔			✔	✔	
Mexico	✔			✔	✔	✔	✔
Panama		✔	✔		n.d.	n.d.	
Paraguay		✔			n.d.	n.d.	n.d.
Peru	✔	✔			✔	✔	
Uruguay		✔			n.d.	n.d.	
Venezuela		✔			n.d.	n.d.	

Source: Based on CINDA (2012).
Note: n.d. = No data.

There are three main initiatives in Latin American countries that are measuring students' achievement during tertiary education (Box IV.4). There are also profession-specific exams in different countries that are used to measure the knowledge and skills of university graduates. In some cases, the exams serve as a professional licensing device. These exams are most common in the health services area, and in recent years they have been established for graduates of education programs.[22]

Box IV.4. Measuring student achievement in tertiary education

SABER PRO is a set of tertiary exit examinations that assess individual competencies of undergraduate students in their final year, and it has been compulsory for graduation since 2010 in Colombia. SABER PRO includes tests of generic competencies (critical thinking, quantitative reasoning, English, and writing) and specific common competencies (defined according to area and type of institution). The purpose of these exams is to produce indicators of tertiary education quality, including learning outcomes, value-added estimates, and performance trends. The exam reflects state-of-the-art thinking on how to measure tertiary outcomes, and provides valuable accountability information, as well as measures of value added by tertiary education institutions (when combined with the results of SABER 11, an exam at the secondary education level).

The Exame Nacional de Desempenho dos Estudantes (ENADE, mandatory starting in 2004) is a two-part test taken by undergraduate tertiary students in their first and last year. It is structured in two parts: general education (25 percent of the final score) and subject area components (75 percent of the final score). It is used to test learning outcomes of students in higher education at the undergraduate level, as well as to evaluate and regulate higher education institutions in Brazil. The ENADE scores of graduating students compose 40 percent of a multivariate score used to rank higher education institutions.

…(continued)

Standardized exams have been conducted on a voluntary basis for the majority of professional and disciplinary areas in numerous higher education institutions in Mexico by the Centro Nacional de Evaluación para la Educación Superior (CENEVAL, a not-for-profit civil organization founded in 1994). The Exámenes Generales para el Egreso de la Licenciatura (EGEL), or final exit exams, assess understanding on essential subject-specific knowledge and skills for 33 different subject areas. There are separate exit exams for technical schools, called Exámenes Generales para el Egreso del Técnico Superior Universitario (EGETSU), which are available for 19 different subject areas and also include an additional assessment of general skills, such as English and IT skills.

Source: CINDA (2012).

As part of many ongoing initiatives to implement competency-based tertiary education programs (Box IV.5), which require a system to assess students based on a series of demonstrable outcomes (Sucre and Garrett 2016), there have also been a number of efforts to develop the corresponding certification systems in tertiary education. For example in Peru, SINEACE (National System of Evaluation, Accreditation and Certification of the Quality of Education) establishes the criteria, standards, and processes for competency-based professional certification.[23] Some related but distinct initiatives to advance the certification of competencies acquired on the job are found in several countries (Jacinto 2010).[24]

A less common approach in the region is the joint effort by employers to define the main skills and qualifications needed by workers in their field, which can directly inform tertiary education programs. For example, the Mining Competency Council of Chile, formed by the main mining companies in the country (public and private), developed the Mining Qualifications Framework, which defines the standards and competencies for all occupations in the industry. The framework outlines 150 occupational profiles, with 278 job competencies, in the six main processes of mining. Higher education institutions, the public training institute (SENCE), and mining companies are currently using the framework.

Box IV.5. Competency-based programs in tertiary education

Because education Box IV.5. Competency-based programs in tertiary education credentials are no longer seen as unambiguous proof of graduates' qualifications, there is a new interest in competency-based curricula and programs in Latin America.

Some universities in the region have been pursuing competency-based models for many years in selected fields. The Instituto Tecnológico de Monterrey (México) started in 1998, with its Medical School and Health Department, which by 2003 had given all its programs defined, competency-based graduation profiles. In 2006, the same process started in the Engineering and Technology Department, followed in 2012 by the School of Education. Faculty and university leaders have identified several benefits of CBE, including that students develop a better understanding of theories and technical knowledge through practical experience, and are able to acquire job-relevant competencies. There are still challenges, however, including insufficient progress in establishing a measurable process to demonstrate that competencies have been learned, developed, and applied by students (Observatorio de Innovación Educativa del Instituto Tecnológico de Monterrey 2015).

The Universidad Nacional de Cuyo (Argentina) provides another example of CBE. Starting in 2002, it implemented a CBE model based on three types of competencies: general (reading comprehension, writing, and problem-solving), cross-sectional (self-learning and general cognitive skills), and area-specific. Programs are organized based on the time-specific competencies that students need to meet for admission, and to progress and graduate. Competencies have been used for decisions on admissions and to assess the effectiveness of courses in foreign languages, engineering, and mathematics (Zalba 2010). For example, the university's technological institute (Instituto Tecnológico Universitario) defined specific competencies both for admission to and graduation from its various programs. Local firms and other stakeholders were involved in the process of drafting these competencies (Gutierrez Daruich 2010).

The Tuning† Project for Latin America began operating in 2004 with more than 230 university representatives from 18 countries in the region and with the participation of European academics. One of the main goals of the project was to change the focus of curricula from knowledge-based to competency-based programs for tertiary education in different countries and institutions. The project has had two phases so far: 2004–2008 and 2011–2013, and has defined the competency-based qualifications of 17 programs in the region: administration, agronomy, architecture, law, education, nursing, physics, geology, history, computer science, civil engineering, mathematics, medicine, psychology, chemistry, and innovation. The project also worked on establishing competency-based evaluation, teaching, and learning.

†As part of the Bologna process to ensure comparability in quality standards of higher education among different European countries, the Tuning Project (supported by the European Commission) undertook the definition of competencies for higher education graduates, faculty, and employers.

It is hard to assess the impact of these various initiatives to introduce outcome measures into quality assurance systems, as the evidence is rather limited. However, considering that perhaps the greatest weakness in existing systems of quality assurance is the emphasis on inputs and processes rather than outputs and outcomes, the testing and competency-certification initiatives are important

innovations which demonstrate that within Latin America there is a desire to find new ways to improve the relevance of tertiary education programs, and that there also exists the capacity to do so.

E. The challenges going forward and highlights of promising practices

Demand for tertiary education is strong and growing stronger throughout Latin America. The tertiary education system, public and private, has responded to this growing demand by expanding and diversifying. However, low graduation rates, falling rates of return on investment, and continuing skills gaps suggest a system that is facing difficulties in terms of efficiency, quality, and relevance.

Efficiency

Low graduation rates suggest that existing educational systems are internally inefficient. This has negative consequences in the labor market, as evidence shows that individuals who do not complete tertiary education have similar returns to those with high school degrees (Urzúa 2012). In addition, the fact that students from poorer backgrounds are more likely to not complete tertiary education makes this a particularly serious equity problem. Given the pervasiveness of low graduation rates throughout the region, the limited focus on public policies to improve these rates is remarkable.

Colombia has been an exception to this pattern. Starting in 2006, it developed the Sistema de Prevención de la Deserción en Educación Superior (SPADIES), an information system to understand, measure, and monitor dropout rates in higher education. SPADIES tracks students throughout the higher education system, collecting information about their socioeconomic conditions and their academic performance and progress. Starting in 2010, based on SPADIES information, the Colombian government promoted several actions to improve retention, not only focusing on the socioeconomic causes of dropout but also including actions targeting institutional and academic factors. For example, retention rates are considered as an accreditation criterion of undergraduate programs, and special competitive funds were established for institutions developing strategies to prevent dropout, among many other interventions (Ministerio de Educación Nacional 2015). As a result of these actions, the national dropout rate decreased from an average of 33 percent in 1999 to 13 percent in 2014 (Universidad de Los Andes 2014).

Quality

The lack of systematic information on learning and labor market outcomes for tertiary education graduates makes an assessment of the quality of the system extremely difficult. What is clear is that quality assurance systems are heavily focused on evaluating inputs and processes instead of outputs and outcomes. Going forward, tertiary education systems in Latin America will need to expand the scope of their measures of quality, including outputs (for example, program completion) and outcome indicators (notably, learning and labor market outcomes).

There are useful initiatives (some in place for a number of years) that provide inspiring examples. Higher education exams, such as Saber PRO in Colombia and ENADE in Brazil, are pioneering examples of how some countries in Latin America can measure the value added by tertiary education institutions. The results of such exams can serve both as indicators for quality assurance systems and as a source of information to future students— helping them make better decisions about the quality

of different institutions and programs that they consider applying to. They can also serve as a source of information to employers as they make hiring decisions.

Similarly, there are good examples of efforts to collect and make public information on the employment and earnings of tertiary education graduates. Once again, that information—when disaggregated to the finest possible level— serves both quality assurance purposes and to inform students, employers, and the general public. Examples such as Graduados Colombia, Mi Futuro in Chile, and Ponte en Carrera in Peru (Box IV.2), could serve as an inspiration to other countries in the region.

In designing quality assurance mechanisms in the region, policymakers should move toward mandatory accreditation with external evaluation and standards, and have standards for institutional licensing. With more and better measures of outputs and outcomes, quality assurance systems could incorporate these outputs and outcomes in their accreditation standards to promote transparency and accountability in the higher education system. Currently, only Brazil and Colombia incorporate student learning outcomes in their quality assurance processes.

Relevance

The tertiary education system in the region has become highly diversified in terms of the participation of public and private institutions and the presence of both universities and other kinds of institutions. However, most of the enrollment is still concentrated in universities. Such degrees tend to take longer to obtain compared with tertiary technical and vocational degrees, and this generates a greater risk of non-completion in a higher education system that already underperforms on completion rates.

Large differences in returns on investment for different fields of study (with larger returns in STEM fields and low or negative returns in humanities and education, respectively) raises questions about the relevance of many tertiary education programs and on the extent to which the lack of diversification in the supply may be contributing to that trend. It could be argued that a more diversified set of institutions and programs (including in terms of duration) could help address these problems.

But diversification is only part of the answer to the challenge of improving relevance. Without a stronger alignment between the content of tertiary education programs and the current and future demands of firms for certain skills, diversification by itself is unlikely to yield the desired results.

Governments have an important role to play in advocating both for diversification in the tertiary education system and for its alignment with labor market demands. Pushing for a higher diversification specifically within the technical-vocational sector—which offers programs geared toward obtaining employment (that is, with strong articulation with employment sectors) that take less time than university degrees—can fulfill both objectives (relevance and alignment) (Box IV.1). They develop young people's skills and provide a recognized certification both within the educational system (allowing continuity and progress to higher degrees) and in the labor market.

Governments can use financial mechanisms to improve the relevance of tertiary education. They can offer demand-oriented funding like scholarships or publicly supported loans for specific types of institutions (for example, those that gain accreditation or pass audits) or specific fields of study (such

as those considered important for national competitiveness or development of specific industries). Similarly, adopting financing mechanisms for tertiary education institutions that reflect needs and demands of employers and also incorporate indicators of relevance (such as graduates' labor market results) could create more incentives.

Finally, part of the answer to the relevance challenge could be a shift in focus from content-based to competency-based tertiary education. This is an area in which Latin American countries could make progress over the coming years, building on the emergent practices at home and abroad. Key to this is the ability to establish stronger connections between tertiary education institutions and firms. Without those connections, it is not feasible to define and adjust the required competencies over time. Building those connections is a long-term process that may need to start gradually in a few strategic sectors, as in the case of the Chilean experience in the mining sector. At the same time, a credible and transparent system to measure and certify those competencies is needed and will demand significant investments in institutional capacity. It is hard to see these changes happening unless tertiary education institutions face stronger incentives (financial and otherwise) to move in this direction, and public-private sector coalitions are built to coordinate these efforts, facilitate the investments necessary to adapt programs and institutions, and develop and implement new assessment systems.

V. ACCELERATING SKILLS DEVELOPMENT IN LATIN AMERICA

The remarkable surge in school enrollment throughout Latin America has failed to yield a well-trained workforce. The evidence presented in this report consistently points to inadequate academic, technical, and socio-emotional skills among both youth and adults.

In Chapter II, we revealed that the bottleneck at the root of this problem is completion of upper secondary school. Admittedly, this represents an important improvement over 10 to 15 years ago, when more students dropped out in lower secondary school. It also means that a critical challenge has shifted from lower to upper secondary education.

Moreover, although enrollment in tertiary education has grown as well, indicators of its effectiveness, such as retention and graduation rates, compare unfavorably to the rates in developed countries. Because higher educational attainment is strongly correlated with better labor market outcomes (Chapters II and III) these indicators do not bode well for Latin American firms searching for talent.

To make matters worse, many of the students who do attend school, and even those who graduate, do not acquire the skills sought by employers, as revealed by employer surveys that we discussed in Chapter II.

An inadequately trained workforce can obstruct productivity growth and prevent workers from obtaining gainful employment. Addressing this problem will demand concerted efforts at various levels of the formal and informal education systems.

As argued in Chapter II, the level of skills development in Latin America can be illustrated by describing three distinct population groups, each facing somewhat different challenges to skills development:

- For the group identified in this report as **poor Latin American workers** (currently the bulk of the labor force in most countries in the region, particularly in Central America, who have not completed secondary education), accelerating skills development demands success in two parallel outcomes: (1) a reduction in the very high dropout rates in upper secondary education, and (2) expanded training opportunities for adults who are already in the labor force (a topic not covered in this report).
- For the growing number of young people entering the labor force with a complete secondary education, referred to here as the **traditional Latin American workers**, the challenge is enhancing the quality and relevance of upper secondary education and diversifying the supply of tertiary education to include shorter-duration programs with strong labor market connections.
- For those we identified as **modern Latin American workers** who participate in tertiary studies and constitute a relatively small but increasingly critical group for the region's competitiveness, it should be a priority to address the high dropout rates in tertiary education and to sharpen the relevance and quality of tertiary education programs in order to close the skills gaps reported by employers throughout the region.

Addressing the problems affecting these three groups of workers will require tackling three key challenges to skills development in upper secondary and tertiary education in Latin America:

- Ensuring the **relevance** of education programs to the needs and demands of the labor market.
- Enhancing the **quality** of education programs to ensure the acquisition of targeted skills
- Improving the internal **efficiency** of the education system by increasing graduation rates, which should also hopefully improve equity in outcomes.

These challenges are interrelated and need to be addressed in a holistic and integrated manner. For instance, efforts to reduce drop-out rates in the absence of efforts to make education more relevant are unlikely to succeed. Similarly, efforts to make education programs more relevant to the labor market (presumably by aligning content) are unlikely to address current skills gaps without a stronger emphasis on the programs' quality, content (including alignment with the demands of the labor market), and achievement levels (to ensure students acquire valued skills).

Critical barriers to addressing the challenges related to efficiency, relevance, and quality of the education system are (1) a lack of information (actionable evidence on the quality of programs, employer demands, and labor market returns) and (2) weak or nonexistent performance incentives for providers of education services. These two issues weaken or obstruct stakeholder decision making because individuals are not well-positioned to make good decisions regarding whether and what to study, and institutions do not have the necessary evidence to revamp their programs of study (both for student and teacher training) in response to changing labor market demands.

Policymakers have some tools at their disposal to address these and other barriers to more efficient, relevant, and quality education. These include making better use of regulations, enhancing the use of financial incentives, providing more and better information, and promoting public/private partnerships.

Drawing on the evidence presented, the deficiencies in the education system highlighted in the previous chapters, and the promising practices being undertaken in some nations—we advance four recommendations for addressing the interrelated problems of efficiency, relevance, and quality by leveraging public policy opportunities.

1. Competency-based education (CBE) provides a good starting point for efforts to improve the relevance and efficiency of education. But in order for this approach to drive change at a systemic level, more decisive action must be taken to use the state's regulatory powers and financial resources to influence uptake and use throughout the education sector.

Improving the relevance of education at both the secondary and tertiary level demands a practical plan for aligning what is being taught with what is required to perform adequately in real-world jobs, including not only technical but also socio-emotional skills. CBE provides a practical way to make that alignment happen by defining graduation profiles that establish measurable learning objectives with demonstrable outcomes.

Some countries in Latin America have made progress toward designing and implementing such competency-based models at the secondary and tertiary education level. The initiatives in the USE system in Brazil, Chile, Colombia, and Mexico (analyzed in Chapter III) or the experience of Mexico's Instituto Tecnológico de Monterrey and Argentina's Universidad Nacional de Cuyo (described in Chapter IV) are examples of this approach in the region.

At the upper secondary level, competency-based models have typically been adopted in making reforms at the system level that are designed to improve various elements of the education system (management, teacher training, curriculum, etc.). However, CBE reforms are unlikely to succeed unless they are part of broader efforts to improve education quality in schools. This is perhaps most obvious when it comes to the role of teachers, most of them trained under traditional approaches and, thus, typically present a barrier to implementing CBE reforms. The implication is that the adoption of CBE approaches at the secondary level must be implemented in close coordination with efforts to revamp teacher training programs.

At the tertiary level, reforms have typically been the result of initiatives by individual institutions and have not been systemwide efforts. In fact, there have been limited incentives to implement systemwide reforms at the tertiary education level. For example, quality assurance systems are widespread, but they do not require the adoption of competencies as a criterion for accreditation. Moreover, certification of skills and competencies at the tertiary level is rare, and as such, it has a limited impact on university curricula.

Without more open and integrated relationships with employers, both secondary and tertiary education institutions will find it difficult to develop and implement CBE approaches or to make the necessary curricular adjustments to close the gap between what academia provides and what the labor market demands.

External certification of competencies is one way to guarantee that CBE actually delivers what it promises both at the secondary and tertiary levels: demonstrable skills. However, as is the case with CONOCER in Mexico and Chile's Valora (Chapter III), certification schemes are hard to implement and have difficulty gaining traction, and they are not commonly used at the tertiary level. The only example is SINEACE in Peru (Chapter IV). Governments could use their regulatory powers and financial resources more effectively to promote such external certification schemes as a way of promoting the adoption of CBE approaches that hold promise for enhancing the efficiency and relevance of education.

2. Improving the relevance and quality of education will require more program diversification and stronger alignment with labor market demands. Public policy can facilitate those changes through more results-oriented quality assurance mechanisms, targeted financial incentives, and closer engagement with employers.

In Latin American countries most secondary school enrollment is concentrated in general, academic programs. Technical and vocational education (TVE) specializations at the secondary level attract fewer students and are usually offering outdated curricula created to respond to the skills requirements of long-gone import-substitution models. To improve the relevance of secondary education, and make it more attractive to parents and students, TVE needs to be revitalized through stronger connections to the world of employment, whether in the form of internships and/or

apprenticeships or through other forms of public/private partnerships. Reforms, like the one in Costa Rica (Chapter III) that updated and renewed specializations based on strong participation by employers, illustrate how this can be done in the context of broader reforms to secondary education.

In spite of the fast growth of the sector, tertiary education continues to lack sufficient diversification. Enrollment remains too concentrated in universities; the supply of shorter-duration programs is, in most countries, limited and underappreciated; and the relative size of technical programs (for which employers express a consistent excess demand) is small. As discussed in Chapter IV, diversification should unfold alongside a robust quality assurance system.

Overall, the tertiary education sector appears to be permeated by systematic market and government failures that often mean its investments in skills development do not match the demands of employers nor consider the long-term needs of the region's economies. Existing quality assurance systems are too focused on measuring inputs and processes instead of outcomes in student achievement and labor market success, which makes tertiary education institutions less inclined to adapt their programs to the changing needs of the economy. Making these programs more results-oriented could go a long way toward creating stronger incentives for tertiary education institutions to diversify (including in terms of length) and enhance the relevance of their program offerings.

And through a more clever use of financial incentives (to both students and tertiary education institutions) governments can facilitate that alignment process. Examples of such incentives for institutions include qualifying for government funding to establish or expand specific programs or to subsidize student fees, whereas student incentives could include scholarships or subsidized loans for programs and fields of study that are identified as strategic or in need of expansion, for example scholarships for studying in particular engineering fields.

3. Information exchange between stakeholders is crucial for system effectiveness. Proactive efforts by educational institutions, industries and governments are necessary to achieve the kind of widespread dissemination of information that enhances outcomes for both individuals and institutions.

In Latin America, decisions at all level of the education system are severely handicapped by a lack of access to information on both the performance of tertiary education institutions and on labor market demands. Information (and transparency) serve a critical function in decision making by all the actors involved in the system: governments at different levels, the productive sector, higher education institutions, schools, students, and families. However, with a few exceptions, countries in Latin America lack institutionalized participation and communication channels among stakeholders, and requirements for information reporting are low.

Decisions by students (on what to study and where) are impaired by the lack of available information on labor market outcomes (employment and income) and the limited data that are available to assess the quality of specific programs and institutions. Labor market observatories such as Graduados in Colombia, Mi Futuro in Chile, and Ponte en Carrera in Peru set a good example of how the government can facilitate more informed decisions by students. But they are more the exception than the rule, and they do not cover information at the USE level. Moreover, proactive outreach efforts to communicate and share information in user-friendly form (rather than more passive initiatives to make information available online) may be required to change entrenched enrollment patterns.

Stronger communication channels between employers and education providers at both the secondary and tertiary level are also needed if programs are to adapt and respond to new and changing demands. Weak links with employers' associations, chambers of commerce, trade associations, and even labor unions make it difficult for schools and tertiary education institutions to assess the relevance of their programs. There is a significant opportunity to strengthen those links and enhance the flow of information between all these actors, as in the case of the Mining Competency Council in Chile (discussed in Chapter III).

Lack of information on system performance also presents a barrier for public authorities as they work to regulate the education sector. At the secondary education level, assessment systems may need to go beyond measuring students' cognitive skills and focus also on socioemotional and technical skills. And at the tertiary education level, a widespread effort to assess achievement levels in standardized and systematic ways (including through the certification of competencies) will be needed in a majority of countries in Latin America.

4. Improving the system's efficiency remains a critical challenge, and will require careful outcomes monitoring and use of data to drive new solutions at the system and individual levels.

At both the upper secondary and tertiary education levels, dropout rates are simply too high. This is a symptom of an inefficient system. Attempting to address the skills development challenges in Latin America without making a real dent on these inefficiencies will be self-defeating.

As is often the case, the first step in addressing a problem is acknowledging that it exists. Making the problem of low graduation rates (at the secondary and tertiary level) more visible, particularly to policymakers who can give it the attention it deserves, will be critical. This will require, as a first step, a more systematic collection and sharing of information on such critical variables as graduation rates, actual duration of studies, and costs—overall, and disaggregated by important institutional and individual characteristics such as type of institution or program; gender; socioeconomic status, etc.

But more generally, addressing the high dropout rates will require administrators to make it a priority for students to graduate on time (whether at the secondary or the tertiary level) and to devise strategies to prevent dropouts. A system like the Colombian SPADIES, which tracks students in higher education and serves as a diagnostic tool to develop appropriate interventions or solutions, is a good example of how information can be used to develop intelligent, evidence-based solutions.

Solutions will need to include both systemic and individual-level approaches, particularly to help students from disadvantaged households graduate on time. Systemic approaches—that is, those that could be employed throughout the education sector—include (1) further diversifying the supply of tertiary education programs, particularly by increasing the availability of short-duration programs, which should help reduce dropout rates, and (2) encouraging education providers to promote on-time graduation by applying regulatory pressures and carefully employing financial incentives.

Individual-level approaches may leverage evidence from monitoring indicators to design appropriate strategies, and may involve a combination of financial support for tuition and for complementary activities (transportation, meals, study materials), academic support (including mentorship and tutoring), and career guidance and support (including guidance on programs of study and labor market opportunities).

The key to devising such solutions—at the system or individual level—will be to develop systematic monitoring efforts that can support evidence-based decision making.

Accelerating skills development in Latin America will demand action on several fronts. There are different tools of public policy and administration available to authorities. Convening a dialogue with actors within and outside the education system to consider the use of those tools is a necessary first step to achieve a social consensus that unleashes change.

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ENDNOTES

[1] Training programs (including on-the-job training) constitute the third channel through which skills are acquired. However, in this report we focus only on skills acquisition through the traditional education system.

[2] For more information about each country's survey, see http://sedlac.econo.unlp.edu.ar/eng/methodology.php.

[3] See time trends for individual countries in Appendix A.

[4] Unless otherwise indicated, all OECD averages presented exclude Latin American member nations.

[5] Unfortunately data disaggregated by physical versus biological sciences are not available. Such data would likely show that women are overrepresented in biological sciences and underrepresented in the physical sciences, as is true in nations such as the United States.

[6] According to the 2011 International Standard Classification of Education (ISCED), issued by UNESCO, upper secondary education programs, or ISCED level 3, are those designed to complete secondary education and can provide skills relevant to employment, prepare students for tertiary education, or both (UNESCO-UIS 2012).

[7] During adolescence, important advances in the neurological development of the human brain take place. The frontal cortex that determines memory, planning capacity, organizational skills, and temper is evolving, and the cerebellum area that regulates decision-making capabilities continues to form (see, for example, Spinks 2002 and Knudsen 2006).

[8] The data represent unweighted regional averages for 18 countries. The data correct for differences in the structure of schooling levels across countries. In Argentina, Costa Rica, Ecuador, Honduras, Mexico, Panama, Paraguay, Uruguay, and Venezuela, the official starting age for USE is 15, with a three-year duration. In Colombia and Peru the starting age is 15, with a two-year duration. In Bolivia, Chile, and the Dominican Republic, the starting age is 14, with a three-year duration. In Guatemala, Nicaragua, and El Salvador, the starting age is 16, with a two- to three-year duration. In Brazil, the starting age is 15, with a four-year duration.

[9] Analyzing cohort trajectories, Bentaouet-Kattan and Székely (2015) found that enrollment rates for females were below those observed for males at ages 12 to 17 for the earlier cohort (exiting USE in 1998-2000) but higher for the later one (exiting USE in 2012-2014).

[10] TVE is generally integrated into the curriculum of formal education systems, unlike training programs. Compared to the general academic model, TVE seeks to provide students with knowledge and skills for performing specific types of jobs. Although TVE is focused on school-age youth, training programs normally target the working-age population.

[11] Data from the 2011 ESRU Social Mobility Survey (EMOVI-2011) by Centro de Estudios Espinoza Yglesias.

[12] COMIPEMS stands for the *Comisión Metropolitana de Instituciones Públicas de Educación Media Superior*. Each candidate takes a general examination and ranks its first six choices of preferred schooling institutions. The process ranks students by their grade in the exam and allocates them to their preferred choices by order, depending on the number of vacancies per school. The further away from the top slots, the lower the probability of accessing their preferred options.

[13] Interestingly, there appeared to be an increasing trend in the proportion of graduates preferring TVE options up to the year 2000 and a significant decline thereafter.

[14] There are some exceptions—graduates from the "industrial" TVE option typically earn higher wages than those from the general tracks—but these exceptions do not apply to TVE at large.

[15] Based on 2008 and 2010 data from the National Survey of Education and Labor Market Trajectories (*Encuesta Nacional de Trayectorias Educativas y Laborales*) and the National Survey for Labor Market Transitions for Upper Secondary Graduates (*Encuesta Nacional de Inserción Laboral de los Egresados de la Educación Media Superior*).

[16] The set of 11 official generic skills as defined in Mexico include the ability of youth to (1) know and value oneself and be able to face problems and challenges with clear objectives; (2) be sensible to art and participate in the appreciation and interpretation of each one's own expression in various genres; (3) choose and practice a healthy lifestyle; (4) listen, interpret, and transmit ideas clearly in different contexts, using adequate instruments; (5) develop innovations and propose solutions to problems in a structured way; (6) sustain a personal point of view regarding topics of interest and general relevance, considering the points of view of others in a critical and reflexive way; (7) learn by one's own initiative throughout life; (8) participate and collaborate effectively in a group of diverse individuals; (9) participate with a civic and ethical conscience in the life of the community, region, country, and the world; (10) maintain a respectful attitude toward intercultural environments and a multiplicity of values, ideas, social practices, and beliefs; and (11) contribute to sustainable development in a critical and responsible way.

[17] In the case of TVE in Argentina, the law has established the existence of a registry of technical and professional educational institutions. Only enrolled institutions can award degrees and certifications. The establishment of quality criteria for being enrolled in the registry is supposed to act as a quality control mechanism. In practice, however, no parameters exist for quality evaluation, and the admissions forms for registry are filled out by the same institutions, casting doubt on this mechanism's capacity to assess or guarantee institutional quality (Fiszbein 2016).

[18] The CONOCER manages three national registries that promote the transfer of knowledge and information for improved labor market performance. The first is the National Registry of Competencies-Based Standards (*Registro Nacional de Estándares de Competencia*, or RENEC). The second is the National Registry of Individuals with Certified Competencies (*Registro Nacional de Personas con Competencias Certificadas*, or RENAP). The third is the National Registry of Competencies-Based Training Courses (*Registro Nacional de Cursos de Capacitación Basados en Estándares de Competencia*, or RENAC).

[19] Tertiary education refers to all formal learning at the post-secondary level. It excludes non-formal or informal learning that is usually designated as "non-tertiary post-secondary education" by agencies like the OECD and UNESCO, and usually corresponds to different forms of workplace training and short courses.

[20] UNESCO defines the gross enrollment ratio as the number of students enrolled in a given level of education, regardless of age, expressed as a percentage of the official school-age population eligible for that same level of education. In the case of tertiary education, the eligible population is the group of persons who are at or up to five years older than the official secondary school graduation age.

[21] In Chile, university graduates with an engineering and technology degree have a return on their investment in education of 163.5 percent, compared to 2.3 percent average returns for graduates in the humanities (Espinoza and Urzúa 2015). Other disciplines with high returns in Chile are law (128.5 percent), business administration (126.8 percent), and science (115.3 percent). In Peru, university graduates from sciences/engineering/manufacturing programs have the largest returns, with an average of 49.4 percent, while graduates in education have negative returns to their investments (-18.5 percent).

[22] Examples are the Examen Único Nacional de Conocimientos de Medicina (EUNACOM) for doctors in Chile and the Evaluación de las Competencias Académicas y Pedagógicas (ECAP) for teachers in El Salvador. Both are mandatory for public sector professionals. There are also the Prueba INICIA in Chile and Prova Nacional de Concurso para o Ingreso na Carreira Docente in Brazil, both voluntary for teachers.

[23] Certification institutions or professional associations, according to SINEACE requirements, conduct the certification process for university graduates. As of June 2015, SINEACE had certified more than 3,500 professionals in areas such as biology, chemistry, nursing, obstetrics, and dentistry.

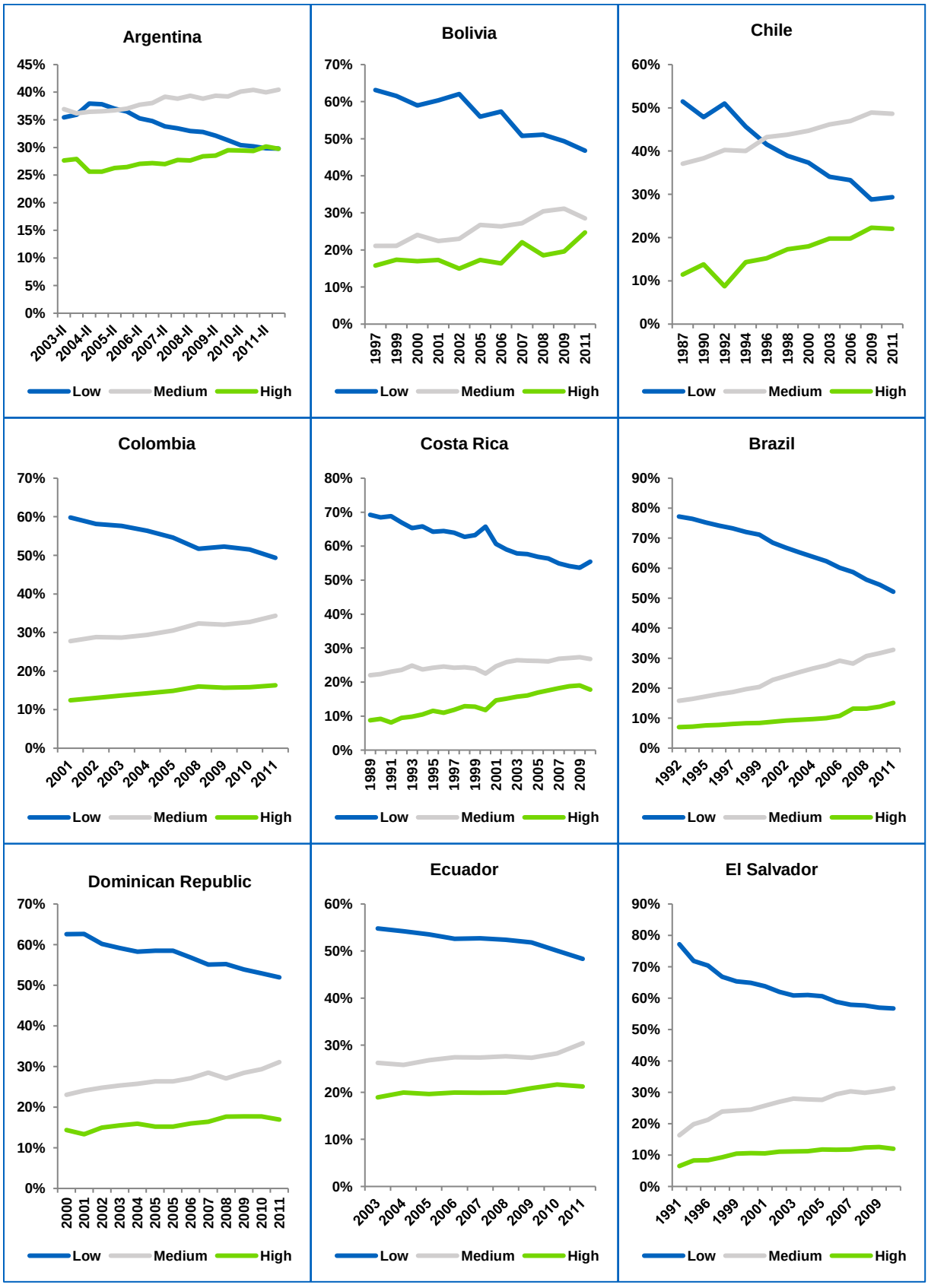
[24] Peru (SENATI, Servicio Nacional de Adiestramiento en el Trabajo Industrial), Chile (Chile Valora and SENCE, Servicio Nacional de Capacitación y Empleo), Colombia (SENA, Servicio Nacional de Aprendizaje), Costa Rica (INA, Instituto Nacional de Aprendizaje), and Guatemala (INTECAP, Instituto Técnico de Capacitación y Productividad).

APPENDIX A:

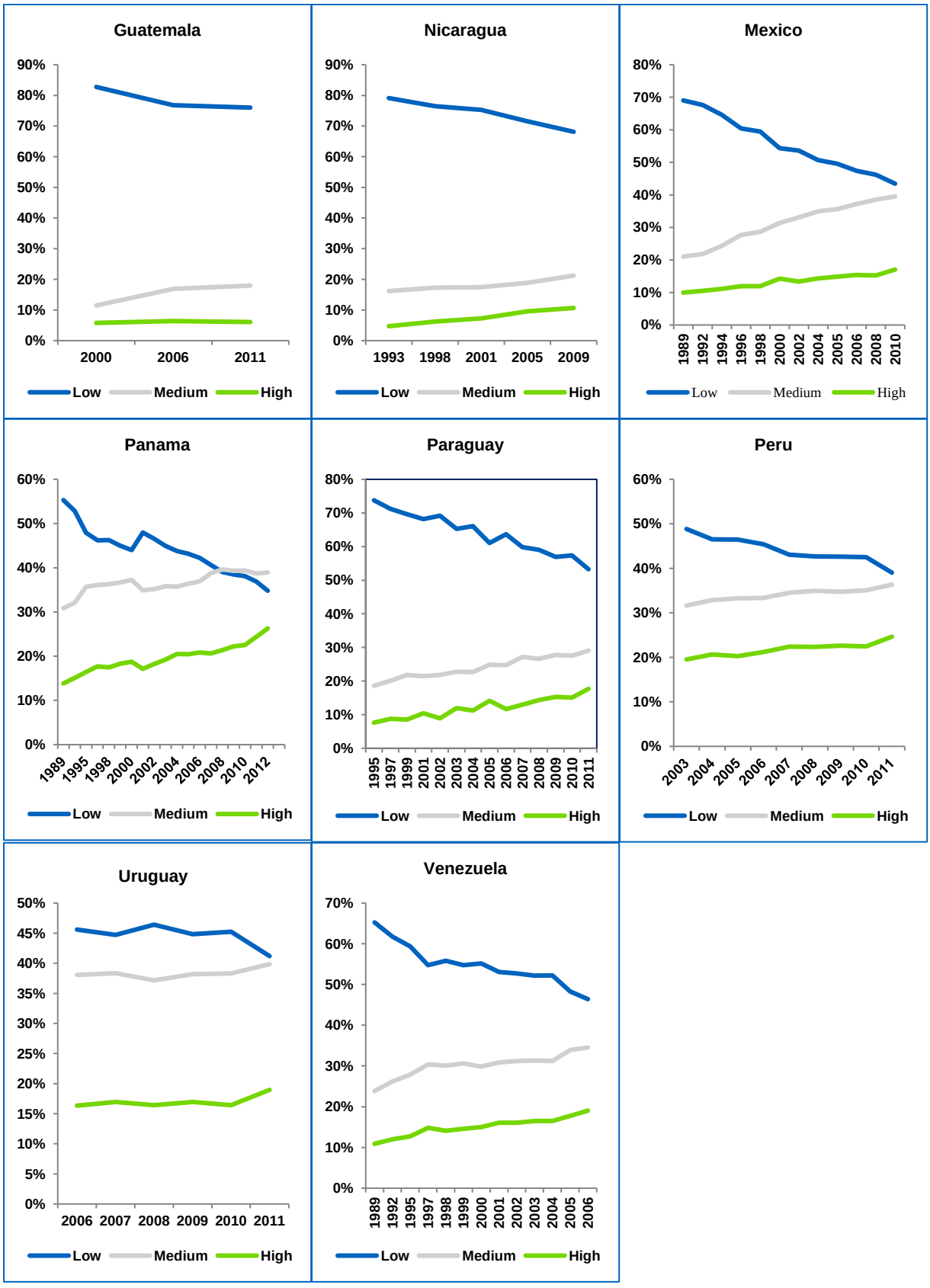
THE SKILLS COMPOSITION OF THE ADULT POPULATION

The graphs use data from household surveys in each country in the region gathered by SEDLAC. For further information about each country's survey, please refer to http://sedlac.econo.unlp.edu.ar/eng/methodology.php.

Percentage of the adult population



Percentage of the adult population



APPENDIX B:

PARTICIPATION IN TRAINING WHILE IN THE LABOR FORCE

Table B.1. Share of employees receiving training in public institutions

	Percent
Colombia	24.0
Chile	14.8
Honduras	12.1
Dominican Republic	10.1
Ecuador	5.7
Panama	4.3
Mexico	1.2
Paraguay	0.9
Uruguay	0.3

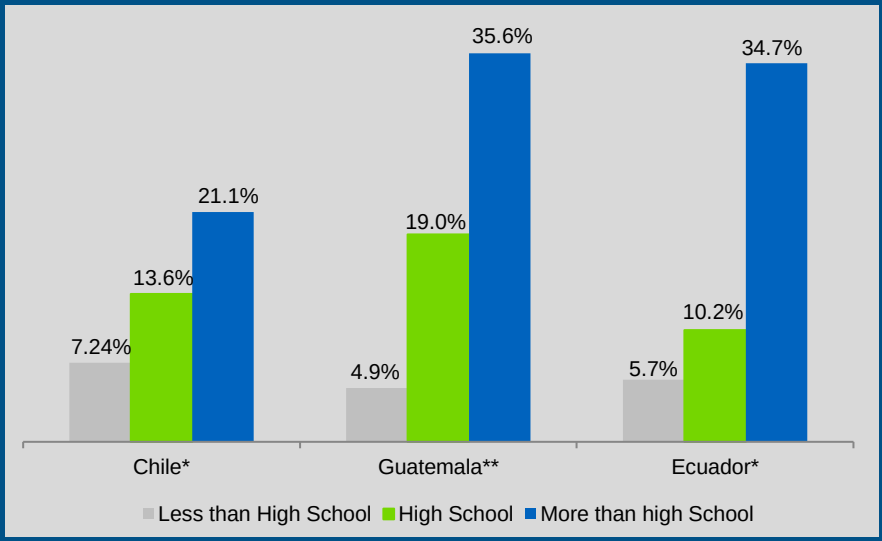
Source: Huneeus et al. (2013).
Note: The estimate for Mexico includes training by both the Dirección General de Centros de Formación de Trabajo and the Colegio acional de Educación Profesional Técnica (CONALEP).

In Table B.1, we present the most recent available data on employed people's participation in training programs provided by public training institutes. It reveals large differences across countries, with less than one percent of those employed receiving training in public institutions in countries like Mexico, Paraguay, or Uruguay and as many as 24 percent of the employed receiving training in Colombia.

In three countries—Chile, Ecuador, and Guatemala—more detailed information on participation in training activities by adults in the labor force is available through recent labor force surveys (Figure B.1). In spite of representing the spectrum of skills development levels observed in Latin America (with Guatemala at one extreme, Chile at the other, and Ecuador in the middle), the extent of training appears similar in the three countries—even if the data are not perfectly comparable across countries. In both Chile and Ecuador, 11 percent of the labor force has participated in training programs in the previous 12 months. A similar percentage of Guatemalan young adults (13 to 29 years of age) in the labor force participated in labor training in the 6 months before the survey.

A striking aspect of Figure B.1 is the sharp difference in the amount of training given the individual's level of education. The percentage of individuals that have more than a secondary education and received training is three to seven times higher than it is for individuals without a complete secondary education. This suggests that training opportunities reinforce educational inequalities within the labor force. This is also consistent with the evidence from other surveys of firms, which suggests that more qualified workers tend to participate more in firm-provided training (Flores Lima et al. 2014).

Figure B.1. Participation in training programs (percent of the labor force)

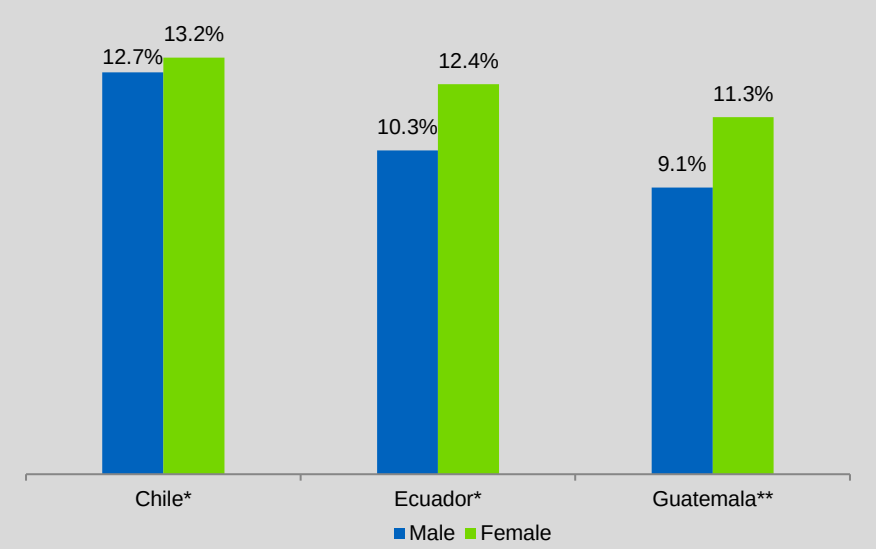


Source: CASEN (2013), ENEI (2013- II), ENEMDU (December 2013)
Notes: * Trained in the past 12 months among the labor force.
** 13–29 year-olds in the labor force who were trained in the past 6 months.
Average participation in training programs is 10-11 percent (10.9 in Chile, 9.9 in Guatemala, and 11.1 percent in Ecuador).

Although comparable international data are not available to benchmark against countries in Latin America, analysis of data from OECD countries that participated in the OECD Survey of Adult Skills (PIAAC) indicates that, on average, 48 percent of adults 25–64 years of age participate in non-formal training (in the prior 12 months), with Italy having the lowest rate at 22 percent. This suggests the average proportion of individuals in the labor force that are trained in one year is notably higher in the OECD than in Latin America, as shown in Figure B.2 (OECD 2014a).

Women participate in training slightly more often than men do in the three countries (Figure B.2): there is a 0.5-point higher participation level for women in Chile, 2.3 points higher in Ecuador, and 2.2 percentage points higher in Guatemala. Not surprisingly, participation is highest among middle-aged adults (31–50 years old) both in Chile and Ecuador, and particularly among those between the ages of 31 and 40 (data not shown).

Figure B.2. Participation in labor force training by gender and age group



Source: CASEN (2013), ENEI 2013-II , ENEMDU (December 2013).
Notes: *Trained in the past 12 months among the labor force
** 13-29 year-olds in the labor force trained in the past 6 months
Data for Guatemala correspond to the workforce of persons 29 years old or younger.

APPENDIX C:

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