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Strengthening Technical Tertiary Education in the Province of Buenos Aires

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CEDLAS	<i>Centro de Estudios Distributivos, Laborales y Sociales</i>
CIC	Council of Cientific Research- (<i>Comisión de Investigaciones Científicas</i>)
DGCyE	General Directorate for Culture and Education (<i>Dirección General de Cultura y Educación</i>)
FNETP	National Fund for Technical Professional Education
GDP	Gross Domestic Product
IDB	<i>Inter-American Development Bank</i>
ISETA	Experimental Higher Education Institute of Food Technology- (<i>Instituto Superior Experimental de Tecnología Alimentarias</i>)
OECD	Organization for Economic Co-operation and Development
PBA	Province of Buenos Aires
PISA	Program for International Student Assessment
TTE	Technical Tertiary Education
TTEI	Technical Tertiary Education Institution

Strengthening Technical Tertiary Education in the Province of Buenos Aires

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1. Introduction

The World Bank prepared this report on technical higher education in the Province of Buenos Aires (PBA) as part of its on-going dialogue with PBA authorities. The World Bank has a long history of engagement with Argentina in different areas of the education sector and is increasing its relationship with provincial governments. This report was prepared by World Bank staff. It is a companion volume to a Spanish-language report developed by the Province of Buenos Aires Commission of Science and Research (Comisión de Investigaciones Científicas, CIC). This report contains a more synoptic account of issues treated at greater length in the CIC-authored report, as well as original analysis and recommendations. The two reports should be read together and considered complements. Both reports help build on the findings of the recently published World Bank report “Argentina Economic Memorandum for the Province of Buenos Aires: Key Public Policy Issues.” A key goal of this analytical work was to improve the empirical base of policymaking for technical tertiary education, especially by linking it to consideration of labor market demand. These reports take the diagnosis of the Economic Memorandum as the starting point for more in-depth analysis of issues in technical tertiary education.

The findings of this report and the CIC-authored companion volume drew on qualitative and quantitative analyses as well as literature review. A qualitative assessment was carried out on the structure of technical tertiary education (TTE), the main issues related to institutional effectiveness, and the efforts of TTE institutions to improve and innovate. Original data were collected through interviews with focus groups of employers in the main sectors employing TTE graduates, directors of programs and TTE institutions, students, and graduates. In addition, labor market outcomes in PBA by level of educational attainment were assessed through a quantitative micro-economic analysis. These two original analyses were supplemented with reviews of relevant literature.

This report aims to provide the Government of PBA and other stakeholders with an analytical framework for reforming the Province’s technical tertiary education system in order to improve its quality and relevance. The Spanish-language version of the report was informally disseminated across different Government entities and various stakeholders as part of a broader dialogue to formulate a project that would design the needed technical tertiary education (TTE) reforms and address the issues raised in the report.

This report has six chapters. This first chapter serves as introduction. Chapter Two focuses on technical tertiary education in the international context and on characterizing the quality and coverage of the general education systems in Argentina and the Province of Buenos Aires. Chapter Three provides contextual background for the Province of Buenos Aires: it describes the Province’s economic role in Argentina and touches upon some of its major challenges. Chapter Four explores TTE in PBA in-depth, summarizing its financing mechanisms and legal frame-

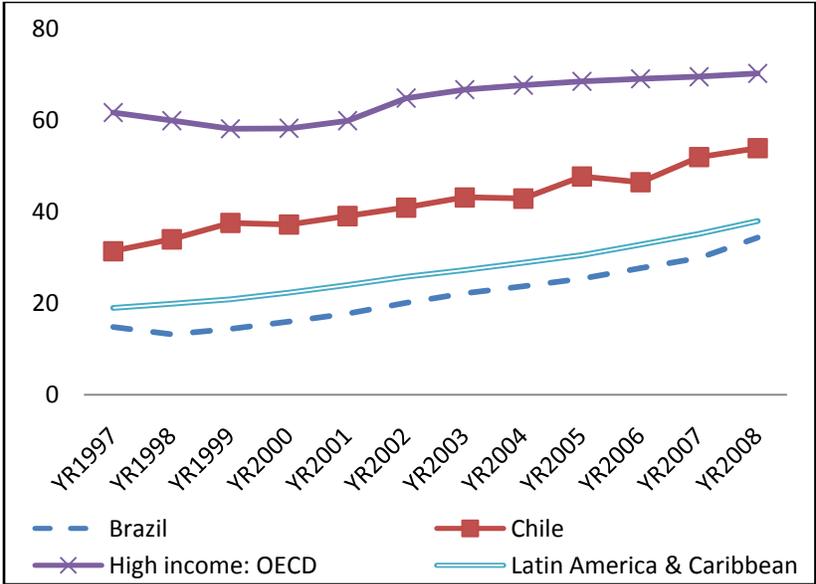
work, and assessing its strengths, weaknesses, reform efforts and degree of efficiency. Chapter Five analyzes the demand for workers in the Provincial economy, including trends in unemployment and underemployment, the impact of these trends on wages, and the perceptions of firms regarding the availability of human capital. Finally, Chapter Six proposes recommendations for the provincial government and other stakeholders for the improvement of the quality and relevance of technical tertiary education.

2. TTE: The International and Argentine Educational Context

A. Technical Tertiary Education in the International Context

Education plays a critical role in fostering productivity. A well diversified and healthy economy needs a world-class education system that covers the multiple needs of students and the work force. Early childhood education helps children get started on the right track. The basic education system (at the primary and lower secondary level) provides the population with basic skills and competencies that all citizens need. The upper secondary education system provides a more focused and specialized education that is sufficient for many workers to operate successfully in their job. However there is an increasing demand for post-secondary or tertiary education around the world. Figure 1 illustrates this trend for Brazil, Chile, Latin America & the Caribbean, and as well as for selected high income OECD countries. In recent years, there has been much attention paid to building up capable university systems that can serve as important sources of research and innovation. Universities typically educate many of the most academically talented students to prepare them for a variety of careers.

Figure 1: Gross tertiary enrollment rate (%)



Source: World Bank Edstats Database

For many potential tertiary students universities may not be the best option. In many countries today, the labor market provides relatively meager rewards to young adults with only secondary degrees (Gil, Fluitman, & Dar, 2000). Even when secondary schools have a technical focus, there has been a growing demand for students to seek a further credential because the labor market is increasingly demanding workers that have better technical skills. Technical tertiary education tends to focus on specific, job-related skills and be “practical” as opposed to “theoretical”. While universities focus on knowledge creation and dissemination, TTE seeks to focus more on imparting skills with immediate labor market demand. With the increase of students graduating from secondary school there is an increasing demand for tertiary education and TTE has the potential to meet these needs. Canada, for example, has the world’s highest proportion of workers with complete tertiary education (56%) thanks mainly to its comprehensive and relevant technical tertiary education system. TTE institutions often have shorter periods of study and more flexible admission policies than traditional universities, which may make them a better fit among certain populations. In addition to opening access and improving equity in tertiary education, TTE institutions have the potential to provide more cost-efficient tertiary education, ensure that graduates have up-to-date knowledge, and to promote economic development in remote or disadvantaged regions (Mikhail, 2008). In the Province of Buenos Aires, where quality at the secondary level is variable, TTE is a particularly important part of the overall tertiary education system.

Despite the clear need for technical skills, TTE often does not reach its potential to support employment and increase productivity. Different countries of Latin America (including Argentina) have adopted a TTE model where the government takes the leading role in designing and implementing technical curriculum. While this model can be carried out in collaboration with trade groups and private employers, there is a tendency for this type of system to become static and not to respond to the changing needs of the economy and employers (Mazeran, 2007). There are many options to ensure TTE is not driven by supply and is responsive to the job market, including working more closely with employers to design and implement curriculum and creating more space for private TTEs. Nonetheless, ensuring the relevance of TTE to labor market needs is a perpetual challenge and concern of well-managed TTE systems.

While there is a great deal of variety in organization, high-performing technical education systems have a number of characteristics in common. Within the OECD, there is a great deal of diversity in how technical education systems are organized. This ranges from a centralized and government-led system (such as France’s) to a system run by local government (as in the United States or Canada) to a system of independent colleges (such as in England). In most countries, the public sector covers the majority of students while in some countries (such as Korea), the private sector is the lead provider. One common feature of effective systems is a relatively high level of autonomy in all of the institutions combined with a strong role of the private sector in the governance structure of the institution or system. This is typically achieved within a

framework of transparent standards and comprehensive accreditation systems. Generally, institutions are required to show that creating new programs or modifying existing programs is done with the participation of employers. While financial arrangements differ, most systems have a capitation payment, often with modifications based on the characteristic of the target student population and/or program. Several countries have introduced performance-based budgeting as well (Mikhail, 2008).

In many countries, an important de facto function of technical education is to provide catch-up or remedial education. Because basic cognitive skills are important for employees in many fields, some technical education programs provide remedial education for students who did not receive an adequate secondary education. Some of the most successful training programs for poor youth include this feature. In Argentina, it is common for university courses to start with a “leveling” program to ensure that all students have the necessary background. So far, few TTE institutes in the Province of Buenos Aires include this element in their curriculum.

Community Colleges in California

Community colleges are the backbone of the public technical education system in the United States. The first community college emerged more than a century ago. Each state organizes its own community college system, leading to important differences among systems. The California Community College System (CCCS) was created in 1967, consolidating an erstwhile dispersed system. California’s system is open to all adults and fees have traditionally been low, with a full time student often paying less than \$400 per semester. Many students receive a two-year degree (associate degree) which allows them to continue on to a university degree. Others take professional, technical, or enrichment courses. In 2009, there were 2.8 million students, of which 32% were full time in 112 institutions. Almost half of the students are 25 years and older. Many students receive financial aid from their college, the CCCS, or the state, while others receive federal scholarships for low income students. Many students also avail themselves of subsidized student loan programs.

The CCCS provides overall financing, academic guidelines, and reviews and approves programs. The community colleges are run by locally-elected boards (there are 72 in total) and have autonomy in selecting staff and in their internal organization. All community colleges offer traditional academic subjects and also a range of technical areas (for example, dental hygiene, business, and physical therapy). One important feature of the community college is its use of working professionals as part-time faculty, which accounts for more than 2/3 of instructors. This faculty has the advantage of bringing up-to-date knowledge to the classroom.

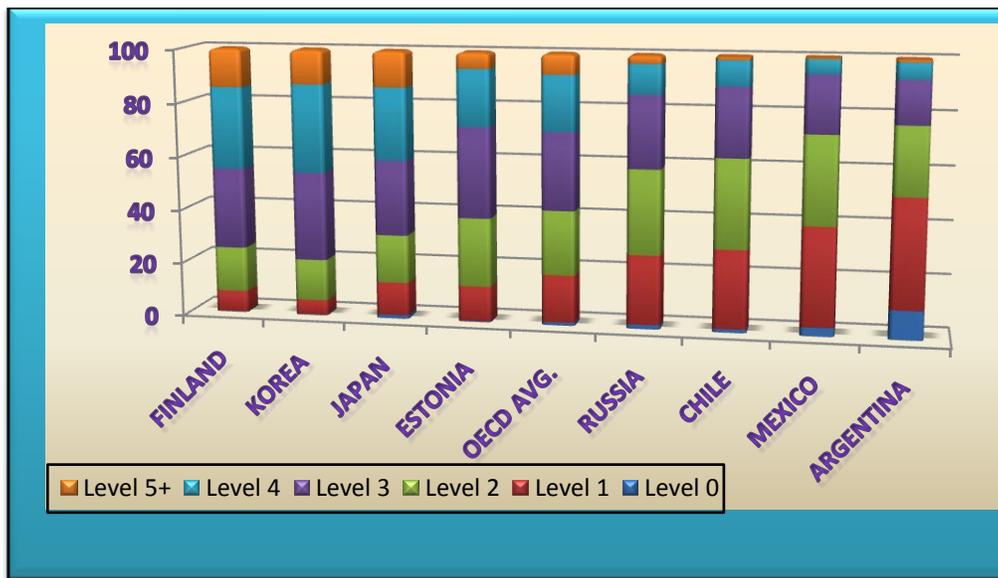
The private sector plays a major role in providing technical education in California and the rest of the United States. California does not have an official, state-wide accreditation system. The Federal Government provides some quality control by restricting public scholarships and loans for students to institutions that meet minimum standards.

B. Coverage and quality of the Argentine education system

High-quality learning plays a critical role in ensuring productivity. There are major differences among education systems in terms of the knowledge and skill level of its graduates. Recent studies have shown that countries with better quality education systems, which train more qualified graduates, tend to grow faster (Hanushek & Woessmann, 2010). International assessments are useful in benchmarking the performance of an education system compared to other economies. The Program for International Student Assessment (PISA) is perhaps the best-known. It focuses on 15 year old students regardless of their grade or level of study. Mathematics, language, and science are the areas covered by PISA. Argentina has participated since PISA began in the year 2000. Internationally-comparable tests are especially good at revealing the degree of variance in academic skills in cohorts of young people. The variance is important because the “mean” score has limited value in a diverse economy where employers select from sub-segments of the labor market with specific wage-skill ratios. Argentina’s PISA score indicates worrying levels of variance; tertiary education policy needs to reflect the challenges posed by such large ranges of knowledge and skills in a given cohort.

In the latest PISA results, Argentina’s scores reflect poorly on the country’s education quality. Figure 2 shows the performance of students from selected countries, broken into levels of performance (ranging from 0 to 5 or 6). Argentina’s low performance and the distribution of Argentina’s results are cause for concern. The majority of the students tested are grouped in level 0 and level 1, while in Chile only around 20 percent of students are in this group. In highest performing countries, such as Finland or Korea, fewer than 10 percent of students are in levels 0 and 1. On the other hand few of Argentina’s students score in level 4, 5, and 6, thus reducing the pool of high performing students. While large countries like Russia and the United States do not score particularly high on PISA on average, both of them have a good pool of high performing students. Of course PISA only measures a certain type of knowledge and excludes important life skills. The results on PISA should be a matter of some concern for policy makers and employers in Argentina.

Figure 2: Student results from PISA tests, by levels of performance (ranging from 0 to 5 or 6)



Argentina’s PISA scores have seen little improvement in education performance. In 2000, Argentina was the top performer in PISA in Latin America. However, by 2009, results for Argentina were stagnant while Chile has passed Argentina as Latin America’s top performer. Mexico has also passed Argentina while Brazil has largely caught up.

Historically, however, Argentina has had a relatively well educated population. Making international comparisons can be difficult due to differences in school systems and quality of data. Although Argentina has a well educated population, it has not been able to maintain its educational leadership position with respect to other countries and may soon find itself trailing some regional comparators. Table 1 shows the average level of education for the population ages 15 years and older in the years 2000 and 2010, the change in those levels, and the average level of education for the population ages 20-24 in the year 2010. The data confirm that Argentina is a generally a well-educated country. In the year 2000, the country’s education level placed it well above the regional average and above the levels of many OECD member countries such as Spain and France. In the year 2010, however, that educational advantage was largely lost in the population age 15 and older. While the sample of countries increased education levels by an average of 1.3 years, Argentine increased by a mere 0.5 years.

Table 1: Average Years of Education for age 15 years and older, 2000 and 2010

Country	Age 15 and older (year 2000)	Age 15 and older (year 2010)	Change between 2000 and 2010	Ages 20-24 (year 2010)
Argentina	8.8	9.3	0.5	11.3
Brazil	4.9	7.5	2.6	10.1
Canada	11.6	11.4	-0.2	11.6
China	6.4	8.2	1.8	10.8
France	7.9	10.5	2.6	12.2
India	5.1	5.1	0	7.1
Korea, Rep.	10.8	11.8	1	13.6
Mexico	7.2	9.1	1.9	11.3
Spain	7.3	10.4	3.1	11.0
United States	12.0	12.2	0.2	12.4
Uruguay	7.6	8.5	0.9	9.9
Average			1.3	

Source: For 2000 data, World Bank EdStats. For 2010 data, Barro & Lee, "Educational Attainment for Total Population," <http://www.barrolee.com/data/full1.htm>

Despite its strong base, Argentina has not kept up with other countries in continuing to increase its tertiary education enrollment. The past four decades have seen a major increase in education throughout the world as countries have expanded their education systems. For early achievers like Argentina, it is important to continue investing in education coverage to ensure that it maintains its advantage. In 1970, an estimated 14 percent of the university-aged population was enrolled at the tertiary level.¹ At the time, this was one of highest coverage rates in the world. Argentina had the highest coverage rate in Latin America and was comparable to tertiary coverage in Australia (16 percent). Since 1970, enrollment in tertiary education has increased in most countries. While Argentina has maintained parity with Spain and several other European countries, it has fallen significantly behind emerging economies such as Korea. In recent years, China has seen the coverage of tertiary education increase rapidly as well. Maintaining and increasing a leadership position with regards to education levels is important because it makes a country and a region more competitive vis-à-vis its neighbors and vis-à-vis the world.

¹ These estimates are based on the gross enrollment rates at the tertiary level, which includes both university and non-university study.

C. Coverage and quality of the education system of the Province of Buenos Aires

The Province’s education system offers broad access to schooling: in terms of primary school-aged children, 98.6 percent are in school.² Approximately sixty-nine percent of the 4.6 million students in the Province are in public institutions.³ “The Province also has a relatively high level of students in higher education: 24 percent of young people aged 19 to 24 attend higher education, of which 70 percent are in national universities and the remaining 30 percent in provincial institutions. This level is similar to the national average and above the Southern Cone average of 16.6 percent.”⁴

Despite the high coverage, the Province of Buenos Aires has a number of low education outcomes that mirror social disparity. These are evident in the important differences between the conurbano and the rest of the Province. In districts on the outskirts of the City of Buenos Aires fewer than 30 percent of youth go on to higher education, compared to around 45 percent in better off parts of the Province. Likewise, students from the Province on average have lower standardized test scores in all grades than the nation as a whole, with the lowest results reported in the conurbano. These differences between the conurbano and the Province persist both across the higher and lower income quintiles, as evidenced by their years of education in Table 2. This table also shows that across all income quintiles, both the conurbano and the Province as a whole lag the rest of Argentine urban areas in terms of years of education.

Table 2: Years of Education by Income Quintile (2006)

	Q1	Q2	Q3	Q4	Q5	Total
Conurbano	7.3	8.2	9.2	10.4	13	9.7
Total urban areas in PBA	7.4	8.3	9.2	10.6	13.2	9.9
Total urban areas in the rest of the country (excluding PBA)	8.2	9.5	10.6	12.0	14.0	11.3
Total urban areas in all the Country	7.8	8.9	9.8	11.3	13.7	10.7

Source: Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.39, originally from CEDLAS (2009) based on 2006 household survey data.

Equally worrying are the high levels of overage students. “While essentially the entire population between 6 and 14 years is schooled, overage students begin building up starting in the first grade, such that 37 percent of 14 year-old students are one or more years behind their age-

² Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.33. From author calculations based on 2001 population census data.

³ Direccion de Informacion y Estadistica, 2008

⁴ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.33. From Education System Statistical Indicators of MERCOSUR 2004. OEI 2004. Percentage of university matriculations for 2004 calculated based on total matriculation (including matriculations not classified by the International Standard Classification of Education).

appropriate grade.”⁵ Although only students who can certify they have finished secondary education can start TTE, upon entering a variety of remedial courses are offered.

Relative education levels within the Province vary significantly. Table 3 outlines the education levels in 2009 in the city of Buenos Aires and four major urban areas within the Province. As expected, the city of Buenos Aires has the highest level of education with more than 55 percent of the population with at least some tertiary education. By contrast the adult population of the *conurbano* has a lower level of education, with less than 25 percent having at least some tertiary education and 38 percent have primary education or less. The other three urban areas are in between.

Table 3: Education level of adult population, by urban area

	Buenos Aires City	Conurbano	La Plata	Bahia Blanca	Mar del Plata
Primary or less	13%	38%	24%	36%	31%
Secondary	31%	41%	30%	41%	38%
TTE	15%	10%	10%	10%	11%
University	41%	12%	36%	14%	19%

Source: (Comisión de Investigaciones Científicas, 2008)

The education level of the Provincial workforce is increasing, but slowly. Table 4 shows the education composition of the labor force in 2009 in the Province of Buenos Aires. The data is similar to what is reported in Table 3 and shows a relatively high share of secondary and tertiary educated workers. Education levels in general have increased constantly. In 2004, 34 percent of the urban workforce had only primary education or less and by 2009, this share dropped to 28 percent, with similar gains at the higher levels. This decrease is part of a long term trend and is matched by increases in the workforce with secondary and especially tertiary education. Table 4 documents the changes in education by level, from 2004 to 2009.

Table 4: Change in labor force education

Education Level	2004	2009	Change	Percentage Change
Less than primary	7.1%	4.8%	-2.3	-32%
Primary	27.0%	23.0%	-4.0	-15%
Secondary	35.5%	37.1%	1.6	5%
TTE	10.7%	12.3%	1.6	15%
University	19.9%	23.0%	3.1	16%

Source: (Comisión de Investigaciones Científicas, 2008)

⁵ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.35.

3. Contextual Background for the Province of Buenos Aires

The Province of Buenos Aires must face the challenge of increasing its competitiveness. Argentina as a whole and the Province of Buenos Aires in particular have benefitted from rising global demand for commodities and favorable terms of trade for their exports. For this period of good fortune to leverage a transformation of the economy to greater levels of productivity, smart investments must be made in productive infrastructure. As part of this desired transformation, the Province must continue to invest in its most valuable resource—its people. Standards of living can achieve an upward trend with less volatility if Argentina and the PBA successfully find ways to make greater use of knowledge and information for productivity. Assuring a proper match of quantity, quality and relevance of human capital is a key element of such a transformation. The interplay of improved technology, increasingly qualified human capital, and other key macroeconomic variables has proven capability of driving growth in low income countries like India and Viet Nam, middle income countries like China and South Africa, and high income countries like the Finland and Korea. Argentina and the Province of Buenos Aires would be well served to maximize current opportunities for productivity-based economic transformation.

Increasing the human capital of its workforce is a key part of the challenge to stay competitive in the global knowledge economy. PBA’s education policy must evolve within the specific circumstances the Province faces. The effects of the 2001 economic crisis and the process of recovery exert perhaps the most important influence on the Province’s ability to reach optimal policies and outcomes for investments in human capital and development. The Province has a long tradition of high rates of educational attainment measured in years of schooling. Recently, the challenge has been to hold onto this leadership position as other countries surge in educational progress. At the same time, the country and the Province must find ways to improve quality and relevance—especially for skills and labor market success—as they seek to protect the tradition of high rates of attendance and completion in secondary education and beyond.

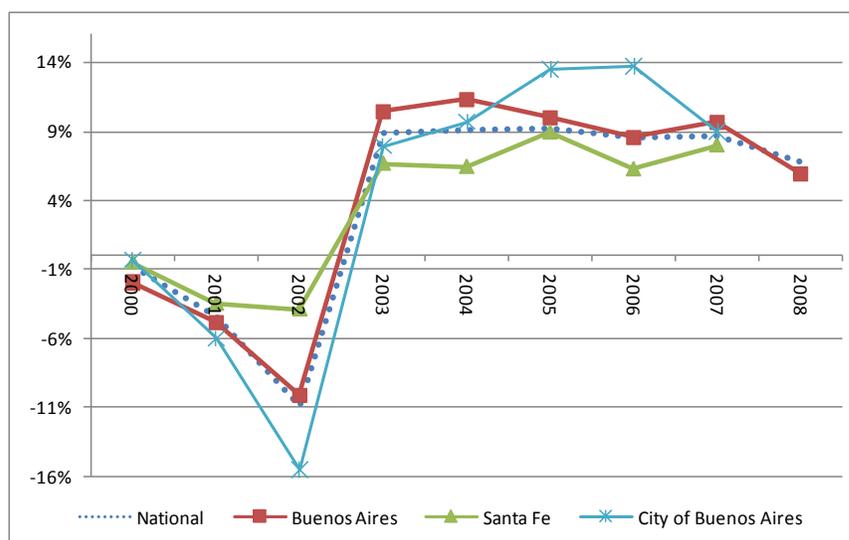
A. Economy

The Province of Buenos Aires has long been the driving force of Argentina’s economy. The Province of Buenos Aires is the largest and most populous of Argentina’s twenty three provinces and the Autonomous City of Buenos Aires.⁶ The Province has a population of around 15 million, 38 percent of the national population. With a gross domestic product (GDP) of US\$ 7,800 per capita in 2009 and a total GDP of \$108 billion, the Province accounts for a third of the country’s GDP.

⁶ The Autonomous City of Buenos Aires, the national capital, has been independent from the Province since 1880. The city has a population of 3 million, about one fifth of the Province’s population. Throughout this report, the Autonomous City of Buenos Aires is treated as a separate province.

The provincial economy has recently outperformed the national economy. After a sharp contraction during the economic crisis of 2001-2002, when the provincial economy shrunk by more than 10%, it grew an average of 9.3 percent between 2002 and 2008 (see Figure 3). Argentina’s output, by contrast, grew by an average 8.5 percent.⁷ Mirroring global economic trends, such growth was followed by a slowdown that started in 2009. In effect, the impact of Argentina’s economic crisis of 2001-02 was felt most in the Province and City of Buenos Aires; this volatility creates fluctuations which will be shown to distort demand and price of labor in some instance, and in other instances reveal the relative value of different sub segments of the labor force.

Figure 3: Economic growth in selected provinces



Source: Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.5 from Staff calculations based on data from National Ministry of Economy and Provincial Statistics Institutes.

“The Province of Buenos Aires has been transformed over the past decades from a predominantly agriculture and industry-based economy to one that has a strong services sector.”⁸ Now its economy is split between the service and industry-heavy *conurbano*—the metropolitan area surrounding the City of Buenos Aires—and the agriculturally-dominated rural areas. This presents a challenge for tertiary technical education policy as it must seek to respond to the entirety of needs of the Provincial economy. Experiments with reform of technical tertiary education have been most successful to the extent they have focused on a single economic subsector or “niche.”

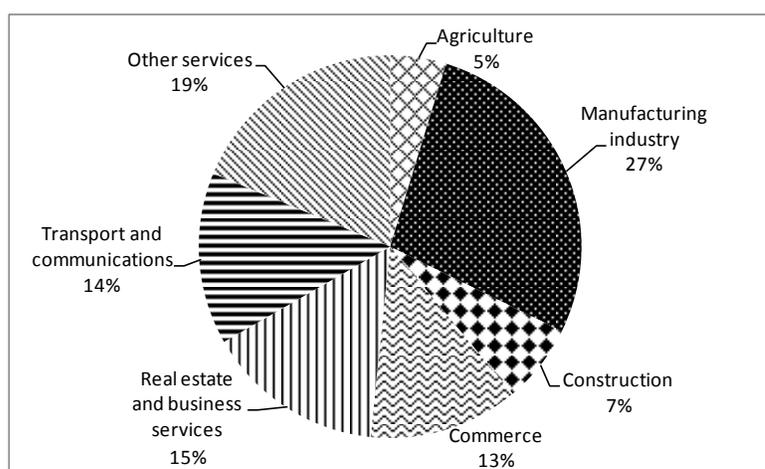
The provincial economy is diverse and dynamic. As per Figure 4, the most important service sectors are real estate and business services, followed by transport and commerce. Key industries

⁷ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.i

⁸ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.ii

include food and beverages, common metals, automotive and automotive parts, oil refineries, and chemical products and plastics.⁹ In total, manufacturing accounts for around 27 percent of the Province’s total GDP, nearly half of Argentina’s manufacturing production. The Province’s \$10 billion worth of manufacturing exports account for a third of the country’s exports. Technical tertiary education institutions have a number degree programs that focus on manufacturing and agro-industrial production. These programs include some of the most dynamic and successful TTEI but also a large number of programs that struggle to maintain the quality and relevance of the curriculum.

Figure 4: Structure of the provincial economy (2008)



Source: Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.2, from the Ministry of Production, Province of Buenos Aires.

“The Province remains one of the largest agricultural producers in the country despite the importance of the services and industrial sectors. With an annual soy production of over 12 million tons (2007/08), the Province of Buenos Aires ranks second after Cordoba and has one of the highest yields in the country. The Province is also the country’s biggest producer of wheat, sunflower, and beef. However, since agriculture now only represents 5 percent of the provincial economy, the Province has benefited relatively less than other Argentine regions from the boom in commodities prices in recent years.”¹⁰

B. Poverty

Poverty and inequality are major challenges for the Province. With the relatively high income of the City of Buenos Aires, the *conurbano* around it tends to be poorer and with greater social disparity. Table 5 shows that the 2010 poverty rate for the *conurbano* was 12.8 percent compared to 12.4 percent in all urban areas nationwide. In terms of unsatisfied basic needs (an

⁹ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.2, with information from the Ministerio de Asuntos Agrarios y Producción, PBA.

¹⁰ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.4

alternative, non-monetary measure of poverty), the *conurbano* is substantially behind the rest of the country, with a rating of 41.1 percent vs. 33.3 percent for the country as a whole. In addition there is a sharp difference between the *conurbano* and the rest of the Province, which is relatively well off. Underlying the high level of poverty in the *conurbano* is a relatively high level of unemployment (the highest in country) and informality (World Bank, 2010). It is important to mention that despite the latter, the Province of Buenos Aires and Argentina as a whole has seen a significant decline in poverty since the economic crisis of 2001-2002. Poverty and unemployment is concentrated among those with fewest years of formal schooling.

Table 5: Poverty incidence in the Province of Buenos Aires and the rest of the country (% of individuals), 2010*

	Extreme poverty	Moderate poverty	Total poverty
<i>Conurbano</i>	2.4	10.6	12.8
All Urban Areas in the Province of Buenos Aires	2.2	9.1	11.3
City of Buenos Aires	1.7	4.2	5.9
All Urban Areas in Argentina	2.5	9.9	12.4

Source: INDEC (2011) Permanent Household Survey, Incidence of Poverty and Indigence, data for second semester of 2010.

* The reliability of these figures is questioned by think tanks and other private institutions.

C. Education

“The education system of the Province of Buenos Aires accounts for one-third of the national system. 4.5 million students—equivalent to 36 percent of Argentine students—are educated in its schools, and 21,000 schools—38 percent of the country’s schools—are located there, including more than half of all private schools. Approximately 246,500 teachers—32 percent of all Argentine teaching jobs—and 38 percent of all teaching hours are in the Province. The provincial system thus educates more students than the entire education system of Chile and a similar number to the state of Rio de Janeiro, Brazil.”¹¹

The Province of Buenos Aires’ education system has experienced a significant transformation since the early 1990’s. Prior to 1992, responsibility for the provision of secondary and technical tertiary education lay with the National Government. These schools were “owned and managed” by the National Government. In January 1992, a new law transferred the responsibility for the provision of secondary and technical tertiary education from the National Government to the provincial governments. The law contains a complicated formula that in theory transfers resources from National Government to the provinces to carry out these responsibilities. In

¹¹ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.32

practice many observers contend the transfers have either not been forthcoming or have fallen short of expected levels. Hence the Province of Buenos Aires has routinely found itself with gaps between its educational expenditures and available resources.¹²

Despite the expansion of coverage and the efforts to improve educational opportunities in the Province, outcome indicators are still relatively low compared to the rest of the country.

“The Province has a significant gap in the overall education level of its population: half of the population has not finished secondary school, which is indispensable for a minimum level of citizenship and integration into the labor market. The Province is also below the national average in education performance. While both indicators are linked to economic and social factors, evidence suggests that education quality can have a significant impact as well.”¹³

In this context, the Province of Buenos Aires faces policy challenges to ensure that it provides relevant education that furthers its economic development.

In the aggregate and over the long term, it is accepted that human capital is an essential element in competitiveness and productivity. Education plays a critical role in most theories of economic growth and development—with more educated workers contributing more to the economy and with education leading to innovation and increases in productivity. It is not surprising that most countries with successful records of growth have made long term investments in education and that these investments have focused both on creating a highly educated group of researchers and innovators and on equipping workers of all levels with the necessary skills to operate and prosper in the knowledge economy. Middle income countries such as Argentina, and sub-regions such as the Province of Buenos Aires, however, must tailor education policy to the specific needs and challenges of the current production structure and labor market. Policy should seek to raise quality across the board and encourage the highest levels of attainment while supplying the labor market with graduates who employers believe have the knowledge and skills needed for specific jobs in specific industries. Like many countries, Argentina has a division of labor at the tertiary level wherein the technical tertiary system trains for more immediate employment while universities seek to develop higher order skills that may ultimately contribute to innovation and structural economic change. As the report shows, employers have mixed feelings about the Provinces ability to meet this challenge.

Policies for building a flexible and skilled workforce should support overall economic policy goals.

Availability of physical capital, quality of infrastructure, macro-economic stabilization, exchange-rate regimes and trends in the terms of trade, along with human capital, all affect Argentina’s economic performance. In the recovery following the crisis of 2001, the Province of Buenos Aires saw favorable overall conditions for economic recovery. Key industries, such as agro-industry and manufacturing, surged in competitiveness and profitability by the mid-2000’s. At the same time, unemployment was high and significant unutilized capacity existed

¹² Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.32.

¹³ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.33.

for most industries. An examination of the dynamics of labor use during this period stands to reveal the actual preference of employers for optimal combinations of formal education and experience in specific industries. The remainder of this report seeks to: (i) describe the technical tertiary education system generally; and (ii) the ways in which PBA's industrial sectors used labor during the period of recovery after the 2001-02 economic crisis, as an indicator of optimal combinations of skills and experience sought.

This report concludes with recommendations for reforming the system of technical tertiary education in order to improve its near-term quality and relevance to labor market needs.

4. Overview of Technical Tertiary Education in the Province of Buenos Aires

A. National context for Technical Tertiary Education

Argentina has a large and diverse tertiary education system. As in many countries, Argentina divides tertiary education into university and non-university sectors. The university sector consists of 89 universities (42 federal, 43 private, 2 provincial, and 2 international) and 19 university institutions¹⁴. Both public and private universities are autonomous, with authority over their budget, their academic focus, and human resources. Public universities are largely financed by the national or provincial budget and offer their education free of charge. The federal and provincial governments make block grants to universities to underlie their autonomy. Argentina has a long tradition of “open admissions” wherein all secondary school graduates may enroll in free, public universities. As a result, enrollment rates have far outstripped completion rates, and many students start at universities before discovering that a different combination of work and education is best for their needs. At the same time, university degrees carry high prestige, and now universities are competing with TTEI to offer non-university-level programs. To add to the complications, national statistics often do not provide reliable information on the number of students who begin in one type of tertiary education program and finish in another, or do not finish at all. Much of this information has to be imputed from other sources.

The technical tertiary system provides an important alternative for secondary school graduates. There is a long tradition of technical tertiary education (TTE), dating back to the creation of vocational education schools and teaching colleges as early as 1870. As shown in table 6, there are a total of 2,204 TTE institutions in Argentina of which around 47 percent are public. Most public institutions are organized at the provincial level. Clear trends are evident in PBA toward more private and fewer public TTEI's, with increasing enrollment per institution. This consolidation may provide the occasion for the elimination of inefficiencies or low-demand programs.

¹⁴ The difference between universities and university institutions is that the former must carry out scientific research and offer degree programs in a broad array of subject matters. The latter can specialize in only a few subject matters.

Table 6: Technical Tertiary Education Institutions and Enrollment
(2008 unless otherwise noted)

	TTEI				Students enrolled in TTE				Students per TTEI		
	total	public	private	% of public	total	public	private	% of public	total	public	private
Argentina	2,204	1,030	1,174	47%	638,884	351,000	288,000	55%	290	341	245
City of BA	301	66	235	22%	107,770	32,870	74,900	31%	358	498	319
PBA	628	338	290	54%	161,000	104,000	57,000	65%	256	308	197
<i>Conurbano</i>	245	90	155	37%							
Rest of province	383	248	135	65%							
PBA 2009	580	264	316	46%	185,600	114,500	71,166	62%	320	434	225
PBA 2010	526	216	310								

Source: Dirección Nacional de Información y Evaluación de la Calidad Educativa, Ministry of Education and Dirección de Información y Estadística

Technical tertiary education institutions are diverse in the programs they offer and the areas in which they specialize. Unlike universities, public TTE institutions are officially decentralized rather than autonomous. This means that each TTE institution has broad control over how to allocate its budget, manage human resources, and select its institutional focus. However, there are more controls over the actions of TTE institutions. The federal government manages a national registry of institutions and a catalog of degree programs. It has set up guidelines to control how institutions introduce new areas of study. This requires the institution to carry out a feasibility study and an analysis of the cost and benefit of establishing a program to ensure that there is adequate demand. Such studies are intended to promote relevance, but they seem to be considered more of a bureaucratic requirement than a consequential exercise for determining program quality and demand; few references were made to these studies during conversations regarding the alignment of educational provisions with labor market needs. Finally, the federal government is carrying out an effort to standardize many of the degrees and certificates along with the contents of the programs.

The importance of TTE at the national level has varied significantly over time. While the first TTE institution was created in 1870 (as a teacher's college), the sector grew slowly with only 37 institutions operating in 1945. Since then, the sector has grown quickly, at times twice as fast as the university sector. While the government committed significant resources to support TTE initially, the sector systematically deteriorated after its exclusion from the 1991 law regarding the transfer of educational services to the provinces. TTE received limited attention and suffered significant budget cuts: its hours were cut back, its ties with the private sector weakened and practically disappeared; and its vocational and technical education quality declined. This trend was only reversed later through the 2005 Professional Technical Education Law, when the federal government renewed its focus on TTE as an important investment in the country's human capital and competitiveness.

B. Technical Tertiary Education Stakeholders

TTE institutions tend to be small compared to universities. Nationally, there was an average of 341 students per public TTE institution in 2008. The city of Buenos Aires had the largest public institutions, with an average size of 498 students, while the Province had 308 students each. Private institutions had even less students, with an average of 245 each. Institutions are quite small by international standards, which raise the possibility that the fixed costs of running the institution are high.

The private provision of TTE plays a growing role in PBA. In 2008 in TTE, 55 percent of students studied in public providers at the national level, 31 percent at the City of Buenos Aires level, and 65 percent at the Provincial level. In 2009, this share in the Province had dropped by 4 percentage points. While the national and provincial governments play a major role in monitoring and supervising private providers, there is little direct cooperation between public and private providers.

Characteristics and Challenges of Technical Education in the Province Buenos of Aires

- The Province has many, mostly public TTE providers
- These providers tend to be small
- Public TTE institutes chose their areas of focus carefully
- Employers are worried about the quality and relevance of TTE

Public TTE institutions are decreasing in number. The number of public TTE institutions in the Province has declined by 20% each year since 2008, implying some consolidation. Although exact causes for this are unclear, students' increasing preference for private TTE may be a strong contributing factor. As Table 6 shows, there were 338 public institutions in 2008, 264 in 2009 and 216 in 2010. Concurrently, the number of private institutions increased, from 290 to 316 between 2008 and 2009. Student TTE enrollment grew by 16% over the same one-year period, split between a 10% growth in public institutions and a 25% growth in private ones. This indeed suggests those new to TTE in the Province prefer private providers, which is particularly meaningful given public ones are free.

The student body of TTE is mixed with varied work experience. While many students go straight from secondary school to the university system, that does not seem to be the case for TTE. Although there are not detailed data on the age of TTE students, an estimated 30 percent of students studied another field previous to the current one (typically in a university). Many others have worked for a few years before entering TTE; in some fields such as logistics the majority of students have work experience in the field. While students from TTE are generally not poor, they tend to have a lower level of income than university students. Most students work while they study: the 2006 Household Survey suggested 57% of students worked. The interviews and workshops conducted in 2010 by CIC for this study suggested up to 70% of students worked.

There are formal channels that encourage linkages with the private sector. Because TTE institutions are small and primarily local in nature, they are well-positioned to identify specific TTE needs in their communities. The private sector may participate directly or indirectly in curriculum design; sponsoring employees for specific courses and degrees; offering internships; and engaging in joint research projects, among others. Professional chambers of commerce are consulted when new degrees are being created (particularly as of the 2005 law), and there are a few specific examples of degrees that have benefitted from substantial participation of the private sector (shipbuilding, food processing, and entrepreneurship, *inter alia*). Despite these linkages, the private sector feels there is a disconnect between the skills they need and the skills offered by the labor market. This is discussed in the following chapter.

Universities also play a role in providing technical education. Although federal and provincial laws give TTE institutions the central role of providing technical education, many universities are also involved. Unlike TTE, this type of technical education is not regulated and practices vary from university to university. Universities have broad autonomy that gives them flexibility in introducing and designing technical fields. Some of these degrees are denominated “3+2” with the first three years leading to an intermediate degree and the final two years leading to an undergraduate university degree¹⁵ however many programs are shorter (typically two to three years) and do not culminate with a full university undergraduate degree.

Characteristics of TTE institutions in the Province of Buenos Aires

There is great diversity among public TTE institutions operating in the Province. Currently there are certificate and degrees offered in 31 professional families. There are both public and private providers in each of the Province's 25 regions. Most TTE institutes focus exclusively on teaching although a few carry out research or technical assistance.

In general, TTE programs have several common characteristics:

**Programs in public institutions are offered at no cost to students*

**Secondary (high school) degree is required for entry, however each institution may have its own requirements*

**Typically the duration of programs is three years and 1,600 hours of study*

** Public institution usually offers four to six different fields of study.*

** Some of the major TTE degree areas taught in the Province include knowledge management; computer systems; shipbuilding; iron and steel; transport, storage and shipment; design; industrial design; industrial services; logistics; customs and foreign trade; business administration; agriculture; food management; agricultural production; environmental management; automation; control and robotics; registration and real estate advertising; media production; communication; cultural management; ceremonies and protocol; health areas; prison services; social work; and tourism and gastronomy.*

¹⁵ The typical length of university program in Argentina is five years.

C. Technical Tertiary Education Financing

Financing for TTE increased significantly with the 2005 Professional Technical Education Law. Under federal law 26,058/05, the federal government established the National Fund for Technical and Professional Education (FNETP), which is financed through a transfer from the federal budget of not less than 0.2 percent of current income of the nation. While this type of fiscal assignment is common for basic education in many countries, TTE is often financed through a variety of payroll taxes or simply included in the education budget and determined through the political process. The Argentine model probably affords the sector more fiscal stability than exists in most countries. Ultimately, however, it is the responsibility of the Province to finance TTE in its jurisdiction through resources it receives from FNETP. In addition, the Province makes contributions to the budget of TTE sectors, and individual institutions have sufficient financial autonomy to enter into agreements with the private sector. The public sector education institutions do not charge tuition. Table 7 shows the PBA 2010 and 2011 budgets for Coordination of Professional Technical Education. It is unclear if this line item accounts for the entire TTE budget.

Table 7: PBA Budget for the Coordination of Professional Technical Education
(in U.S. dollars, at 3.9 average exchange rate)

	Total	Personnel	Goods (consumption)	Services (excluding personnel)	Goods (use)	Transfers
2011 budget	722,845,339	713,652,949	10,256	7,371,698	15,564	1,794,872
2010 budget	495,269,114	487,320,866	5,641	6,129,171	18,564	1,794,872

Source: Ministerio de Economía, Subsecretaría de Hacienda, Presupuesto, “Composition of Expenditures by Institutional Level, Program and Line Item,” accessed on June 27, 2011.

<http://www.ec.gba.gov.ar/areas/Hacienda/Presupuesto/Presupuestos/2010/php/ejercicio2010.php>

Financing prior to the 2005 Law was quite unstable for public TTE. In the education budget, TTE institutions had the least stable budgets and were often the first to be cut in economic downturns.¹⁶ In many ways, the sector was known as the “forgotten” sector of education. During economic slowdowns, this led to a significant decline in investment, which made it difficult for the sector to keep up with developments in the productive sector. The decline in investment was not exclusive to TTEs. During the 2001-2002 crisis capital expenditures for the Province—which were already on a downward trend in the late 1990s—shrank by 73 percent between 2000 and 2002 (to a mere 6 percent of total expenditures).

The 2006 Education Financing Law (No. 26,075/06) included as a target that total spending on education should reach 6 percent of GDP by 2010. The 6 percent target applied to the national level, but the main burden of this increase fell on provincial budgets because the provinces

¹⁶ “Estudio para el Fortalecimiento de la Educación Superior Técnica en la Provincia de Buenos Aires,” Comisión de Investigaciones Científicas, 2010

are responsible for most education services. Accordingly, the share of education spending in total Province spending rose from 28 percent to 38 percent between 1991 and 2008. Although this helped the Province meet the 6 percent target, it is likely to have distracted policy makers from making necessary and overdue structural TTE reforms.

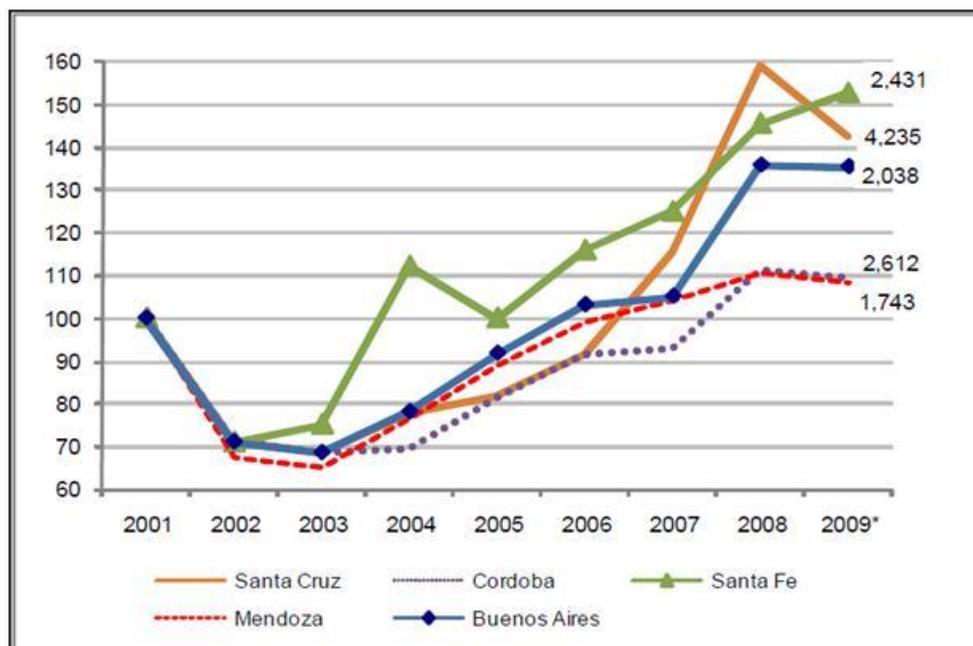
Although 6% of GDP invested in education should lead to high learning outcomes, additional education sector resources have mostly financed teacher salary increases. “Large increases public sector wages, led by teacher salaries, have limited the Province’s fiscal space in recent years, leading to a reduction in capital expenditure and other non-personnel spending. Real direct investment has fallen from an average of 1.3 percent of GDP in the 1990s to 0.6 percent in 2008. Earmarked transfers from the federal government and multilateral investment loans (including counterpart funding) account for more than half of all real direct investment and thus ensure a minimum of public investment in the Province.”¹⁷

Today, teachers account for roughly half of all personnel spending. “The post-crisis recovery in real teacher salaries, largely as a result of increases in the minimum teacher salaries negotiated between the teacher unions and the federal government, has therefore had a particularly strong impact on the Province of Buenos Aires compared to other provinces. As Figure 5 shows, teachers’ salaries stayed constant in nominal terms between 2001 and 2003, implying a fall in real wages of 32 percent. The adjustment of real wages began in 2004, and by 2006 they had recovered to pre-crisis levels; strong increases between 2007 and 2009 means that they are now 35 percent higher than in 2001. These increases tend to have an escalating effect throughout the public sector, as other unions demand the same wage increases, leading to an across-the-board expansion of personnel spending.”¹⁸

¹⁷ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.iv

¹⁸ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.21

Figure 5: Teacher salaries in selected provinces (Ar\$ constant; index 2001=100)



Note: Salaries deflated by private estimates of CPI inflation. Source: Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.21, from staff calculations based on data from Ministry of Education, Science and Technology.

D. Legal framework

Responsibility for TTE in the Province is shared among three agencies. (i) the Council for Scientific Research (Comisión de Investigaciones Científicas or “CIC” in its Spanish language acronym); (ii) the Ministry of Production; and (iii) the General Directorate for Culture and Education (*Dirección General de Cultura y Educación* - DGCyE). The rationale for this partnerships stems from the nature of technical tertiary education –unlike primary and secondary general education, it often involves areas of specialized expertise such as agriculture research, industrial engineering, and information science. The CIC promotes active research agendas in these areas and therefore has access to the subject area expertise that underpins reform. The Ministry of Production maintains close contact with the dynamics of firm demand and shifting labor market conditions. The DGCyE encompasses the overall institutional framework for management of the systems and formulation of policy. The DGCyE and the CIC have devised formal work agreements to define the areas of responsibility and action of both actors within the tertiary technical education field. In practice, the division of responsibility for the TTE system’s quality, relevance and effectiveness may lead to some measure of lack of overall accountability.

The national legal framework for TTE was specified by the 2005 Professional Technical Education Law. The law outlined the objectives of technical tertiary education and typified the institutions that would be allowed to impart it. Importantly, it created three instruments for

TTE’s continuous improvement: (i) the Homologation of Degrees and Certifications, which analyzes and evaluates the study plans of technical degree and certificates; (ii) the National Catalogue of Degrees, which categorizes TTE degrees into professional families; and (iii) the Federal Registry of TTE institutions, which keeps a central database of all institutions legally allowed to operate according to national quality criteria.

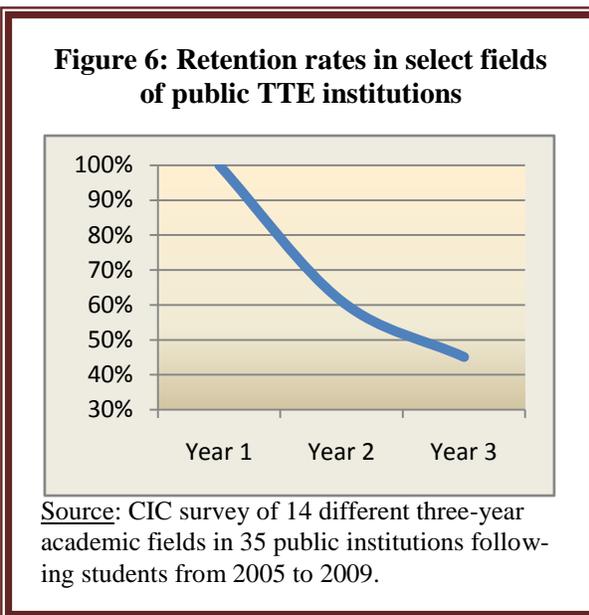
The Province of Buenos Aires established its own regulatory framework for TTE in 2007.

The Provincial Education Law (13,688/07) explicitly includes TTEs as one of the responsibilities of the provinces and reinforces the roles of the provincial accreditation agency of technical education (created in 2003) and the Provincial Council of Education and Work (known as COPRET). The provincial accreditation agency focuses on developing necessary labor competencies (for example, for an analyst in food quality) to ensure that institutions offering TTE programs meet a certain minimum standard. The Provincial Council serves as a forum to discuss and coordinate policies between the education system and the private sector. At the local level, regional education authorities and, in some cases, the private sector play a major role in planning TTE, in particular regarding the introduction of new fields.

E. The efficiency of Technical Tertiary Education System

High drop-out rates significantly curtail the impact and efficiency of TTE. Efficiency is an important concern in education and refers to the capacity of institutions to graduate students that enter the system to study. A system that is not able to graduate many of its students may be admitting too many unqualified students or it may be implementing a poorly designed curriculum or teaching program. With a more efficient program, a system may be able to graduate more students at only a slightly higher cost or it may be able to graduate the same number of students at a lower cost. How efficient is the TTE system in the Province of Buenos Aires?

The evidence suggests that TTE in the Province of Buenos Aires is not efficient. CIC surveyed 14 different three-year academic fields in 35 public institutions following students from 2005 to 2009.¹⁹ This is not a census of all institutions or a representative sample of the programs; it is an indicative sample. Figure 6 summarizes the average retention rates of these programs.



¹⁹ “Estudio para el Fortalecimiento de la Educación Superior Técnica en la Provincia de Buenos Aires,” Comisión de Investigaciones Científicas, 2010.

The retention rate is quite low, averaging only 45 percent at the time of graduation. There is not great difference among the programs—the two best programs (marketing and agriculture) have final retention rates of 56 percent and 52 percent respectively. The programs with the highest drop-outs are IT-related (39%), logistics (37%), industrial energy (37%), and grain transport, storage, and shipment (38%). Between 46 and 38 percent of this dropout happens in the first year of study. Clearly, the TTE system in the Province of Buenos Aires will have to work to improve its efficiency given the limited public budget and the need to increase capital investment.

The causes behind the high drop-out rate are varied. It can be challenging to identify the causes of school drop-out at any level. In the case of TTE, it was not possible to survey students that entered the system in 2006 and understand the reason for leaving school from the student's perspective. The directors of the public institutions were interviewed to get their perception of the high levels of drop-out in TTE. While analyzing an unrepresentative sample is less than ideal, it does allow some understanding of the challenges faced by students. Given the nature of the data, it probably puts too much emphasis on problems with students and not enough emphasis on limitations in the TTE system or in the institutions. In order of importance and number of times mentioned, the cited reasons from dropout were:

- a) ***Economics.*** In many cases, students leave school to find work (high opportunity cost of time) and to help their family's well being. In addition, the cost of transportation and materials limits some students. There are few options for scholarships or financial aid.
- b) ***Family reasons.*** In addition to economic reasons, many students have family issues that impede them from staying in school. Many in fact work full-time and have families to take care of.
- c) ***Education problems.*** Some students do not have sufficient academic background or don't have the capacity to complete the course.
- d) ***Institutional problems.*** Many programs lack the flexibility to maintain students that have to work or have other responsibilities and in many cases, the institution lacks the infrastructure and equipment to make it attractive for students.

The dropout rate for TTE is lower than it is for universities. One possible explanation is that students who enroll in TTE may have previously dropped out of university education. Recall Argentina's free and open university admission policy encourages all students with complete secondary school to enroll in university, whether or not it is the best educational option. This means that upon TTE enrollment, students who have followed this "university first" path are older and have more information and experience with which to make a choice regarding their area of study.

F. Technical Tertiary Education Strengths, Weaknesses and Reform Efforts

Public TTE in the Province has several strengths. It has significant regional and subject-matter coverage; a strong vocational nature; staff that is selected via merit-based, public competition; and curricular flexibility for institutions to develop competencies and knowledge areas that target local needs. In addition, its low teacher-student ratio allows—in the best cases—for smaller classes, more interaction with professors, more tracking of student performance, and greater personalized student attention.

Publicly provided TTE in the Province has three main weaknesses. First, it has outdated technology and insufficient infrastructure and equipment. Hands-on learning often takes place with tools that are no longer in use, hampering students' relevance in the labor market. Second, it has weak linkages with the private sector. Students are hard pressed to find internships with companies while they are in school and have difficulties finding jobs once they graduate. Various factors may account for the labor market difficulties, but they suggest the education provided lacks quality and labor market relevance. Third, it has high drop-out rates, which suggests institutions are not using resources efficiently and are not meeting students' expectations. Students are choosing to attend private institutions over public ones, further confirming this.

Efforts for systems-wide reform of public TTE have not been successful. The last structural reform proposed was hampered by the 2001-2002 economic crisis. The Inter-American Development Bank (IDB) started a project in 1998 in Argentina called, "Reform Program for Non-University Technical Tertiary Education". Between 2000 and 2003, the project suffered strong setbacks due to the political crisis in Argentina. In addition, initial disagreements among stakeholders; complexity regarding financial management and process set-up; difficulties recruiting and maintaining teams of TTE professors; and insufficient student demand for new degrees and institutions further complicated the situation. As a result, implementation was delayed, goals were reevaluated, and \$60M of the \$82.5M originally approved for the project was redirected. In the end, the project cost \$36.3M, \$16.3M of which was loaned by the IDB. Despite the stumbling blocks along the way, the project accomplished two important things: first, it piloted an evaluation and accreditation system for technical tertiary education programs and projects, accrediting 17 technical institutions. Second, it sponsored projects in 17 technical institutions to improve their programs' quality, efficiency and relevance to the labor market, and thus created 43 new degree programs. Two of the institutions that benefitted were located in the Province.

Targeted reforms have shown some promise. The reforms in specific institutions that CIC has helped see through have met with reasonable success. One example of this is the Experimental Higher Education Institute of Food Technology (Instituto Superior Experimental de Tecnología Alimentaria – ISETA) where CIC encouraged and promoted an approach to TTE that simultaneously incorporated teaching, research and problem solving. In addition, it involved active involvement with the local private sector and decreased dependence on public resources. As the text box on this page attests, the ISETA experience demonstrates how centering education on the concrete needs of future employers produces benefits. First, it strengthens the linkages between TTE institutions and employers through continuous interaction and problem-solving. Second, it raises the levels of confidence that employers have in the capabilities of staff and students at a given TTE institution. Third, it promotes hands on experience for students with real industrial problems. Fourth, it creates early, consequential contacts between students and future employers in a format where students can demonstrate their skills and competencies.

G. Conclusion

The Province’s relative lack of attention to TTE from a financial, managerial and a policy perspective impedes the system’s ability to create sufficient numbers of gra-

Public - Private Partnerships

The case of the Experimental Higher Education Institute of Food Technology (Instituto Superior Experimental de Tecnología Alimentaria – ISETA)

ISETA began operations in 1978 in the City 9 de Julio, located in the geographical center of the Province. Its coverage today extends beyond the center, with students attending from all over the Province. ISETA depends on the Province’s General Directorate for Culture and Education (DGCyE), and has strong ties with the CIC and with the 9 de Julio Municipality.

ISETA successfully combines teaching and research with deep links to the private sector. This triggers a virtuous, cycle wherein the Institute imparts a high level of teaching, develops its own applied research agenda, and provides local SMEs (small and medium enterprises) services and technical expertise for their specific production issues. These three activities result in increased regional visibility, additional resources, enhanced student job prospects and easier graduate insertion into the labor market.

ISETA typically partners with companies, other institutions and official agencies to conduct scientific and technological research on areas such as nutrition, meat, dairy, grains, and food quality and sensory evaluation. ISETA’s food technology specialist group is particularly active, conducting research, providing technical expertise, and selling its laboratories services to the community and to the local food industry. Services involve physical, chemical and microbiological analysis of soil, water, seeds, feed, and food products in general.

With regards to teaching, ISETA offers five degree types: Food Quality Analyst; Senior Technician in Food Technology; Industrial Maintenance Technician; and Technician in Agricultural Livestock Production. It has 134 students, a third of which are enrolled in Livestock Production. Slightly more than half of students are female, only 20% work and study simultaneously, and 60% are less than 24 years old. ISETA partnerships enable 10% of students to partake in company internships. Half of ISETA’s 66 teaching staff work in the areas in which they teach, further strengthening ISETA’s ties with the private sector. Upon graduating from the Senior Technician in Food Technology program, students may transfer into several local universities to pursue a professional Food Technology degree.

duates with high quality, relevant education. Before 2005, the TTE system was mostly on outside the purview of policy attention and suffered the malaise typical of a forgotten system. Although the 2005 National Fund for Technical and Professional Education ameliorated this situation, concerns with the operation, efficiency and policy direction of the TTE system persist for several reasons. First, continued increases in teacher salaries constrained investment in new teaching material and equipment. Second, although the number of public TTE institutions has decreased recently, institutions still tend to be small, averaging around 430 students each. This may imply a relatively high administrative cost and may also lead to inefficiency, as infrastructure and equipment has to be purchased for each institution. The high cost of operation and the few economies of scale further constrain necessary investments. Finally, the fact that TTE oversight is split across three agencies (CIC, the Ministry of Production; and the DGCyE), has divergent effects: on the one hand it has allowed a broader vision of relevance and efforts to try to unite research and teaching. At the same time, the presence of three agencies in TTE management may have allowed responsibility for system quality, relevance and effectiveness to be overly diffuse. In some ways, TTE has many champions but no single one of them has achieved the political consensus necessary for large scale reforms. One factor that may contribute to the relative low priority of TTE is the 2010 deadline to meet the 6 percent of GDP national education spending target. Some observers feel this pressure in other areas of education policy has distracted policy makers from making necessary and overdue structural reforms in TTE.

Some students do not feel TTE is a good investment of their time, as suggested by the high drop-out rates. Like many education systems, Argentina tries to guarantee equity and access by offering public education at no cost to students. In practice, this approach rarely works to improve equity and ends up subsidizing middle and high income families. Students in TTE tend to be poorer than university students although by no means do they come exclusively from the poorest families in the Province. In the opinion of TTE institution directors, lack of money, family issues, and insufficient academic preparation are major concerns for students and lead to a high level of drop-out. Since public technical education is “free,” this means that a significant proportion of students may perceive that TTE has a high opportunity cost and a low rate of return. New students are choosing to attend private TTE institutions over public ones, further confirming this.

TTE may not be sufficiently able to compensate for students’ poor basic and secondary education. Human capital should not be a constraint to growth in the Province and in Argentina more generally. To avoid this situation and increase the competitiveness and productivity of the Province, the TTE system should strive to (i) facilitate future learning, both on-the-job and in further formal education; (ii) partially compensate for deficiencies at lower levels of education (be a “second chance” system); and (iii) impart relevant, high-quality skills.

The following chapter will describe the Province’s labor market and analyze its demand for skilled technical workers.

5. The Labor Market and the Demand for Workers

A. The Distribution of Workers in the Province of Buenos Aires

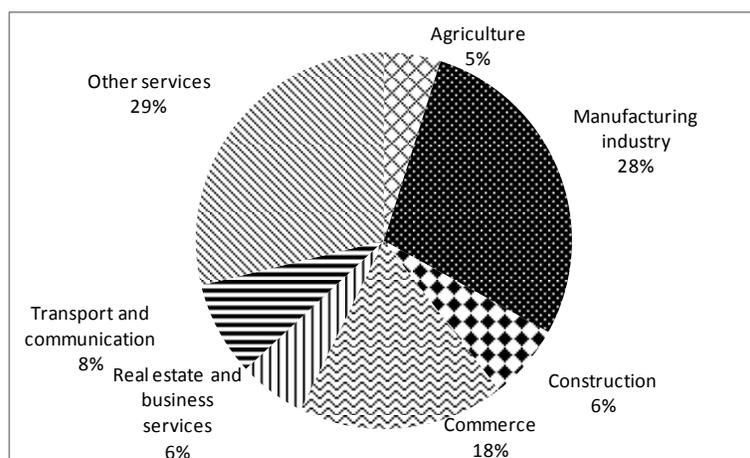
The Province of Buenos Aires has the largest workforce in Argentina. According to the 2001 Census, the potential workforce (the population between the ages of 25 and 65) was 6.3 million and it is estimated to be 7.5 million in 2010. The population has grown due to natural fertility and migration from other regions of the country. The Province has become an important destination for workers due to its varied economy and access to the Buenos Aires region. Like the world as a whole, the provincial population is ageing—the share of youth (ages 0 to 24) has declined from 43 percent to 40 percent of the entire provincial population between 2001 and 2010. This decline was matched by 3 percent increase in the share for the working population. Almost the entire decline in the share of the youth population has come with younger children and the absolute number of children under the age of 14 has declined. While these shifts appear small, they will continue for the foreseeable future and lead to a growing demand for higher education and work.

Major Challenges in the Buenos Aires Province Labor Market

- Increasing working age population
- Increasing demand for skilled workers
- Decreasing employment prospects for unskilled workers
- Low quality general education
- Low quality technical education and work skills

The distribution of employment by sector in the Province largely mirrors sector shares of GDP. Commerce and “other services” employs 5% and 10% more people than its share of GDP, while real estate and business services, and transport and communications, employs 9% and 6% less, respectively.

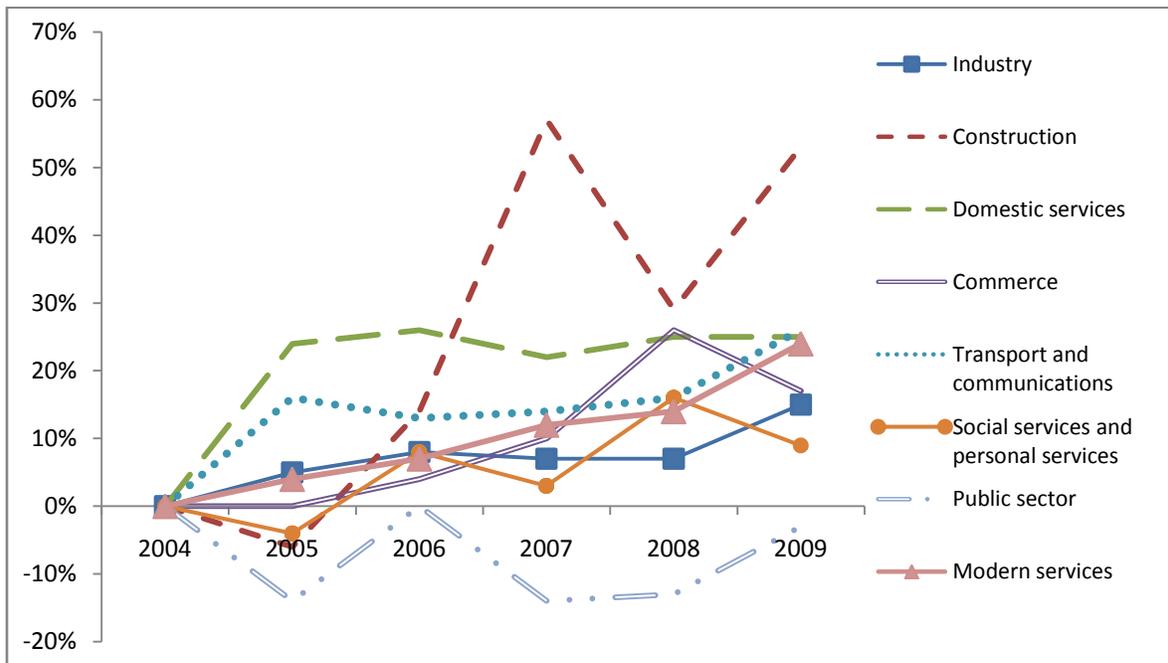
Figure 7: Employment by sector (2008)



Source: Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, p.3, from the National Ministry of Labor

Sectors that grew fastest in terms of employment were construction, transport and communications, and “modern” services. In terms of salaried employment in the city of Buenos Aires and the *conurbano*, construction grew 53% between 2004 and 2009. Although it had already reached this growth by 2007, the international financial crisis interrupted its trajectory in 2008. As per Figure 8, other sectors that grew significantly during the five year period were transport and communications (26%), domestic services (25%), and “modern” services (24%). It is important to note that only in construction did wage movements correlate strongly with employment growth. In transport, modern services and industry, wages recovered from their lows during the 2001-2002 crisis. The public sector and domestic services showed comparatively the least gains in terms of wages.

Figure 8: Percent changes in salaried employment, by economic activity in the agglomerates of Buenos Aires



Source: CIC p.55, team calculations based on data from Household Survey and INDEC

Note: Applies to individuals between 25 and 64 years of age. Measured in the 1st trimester of every year.

B. Employer perceptions

Employers have expressed frustration with the skill level and competence in the available supply of workers. While the past decade has seen an important increase in employment in the Province of Buenos Aires, employment mismatch has been a preoccupation for those doing the hiring. Employment mismatch occurs when work force (“the supply”) does not offer the job skills or qualifications that employers (“the demand”) would like to have. Between 2005 and 2008, employers reported that they were not able to fill 40 percent of their openings for skilled

workers.²⁰ These statistics suggest that firms in the Province of Buenos Aires have a serious problem in finding qualified workers. The economic sectors that seem to be most affected are located in food processing, pharmaceuticals, plastics, paper products, metallurgy, machinery, and various areas of manufacturing. There is a particular lack of workers in the areas of production and maintenance, where employers reported they were not able to fill an average of 50% of their skilled worker openings, and up to 85% of them in 2007.

Employers have identified lack of relevant experience as one of the several underlying causes for the poor skill level. As part of the CIC report there were extensive interviews with employers. Firms expressed mixed opinions about the impact and performance of TTE in the Province, noting that graduates cannot transition easily from school to work. Employers seem to value the small segment of the labor force with complete TTE and work experience, but their general doubts about the quality of TTE come across clearly in focus group interviews. The concerns about TTE institutions centered on:

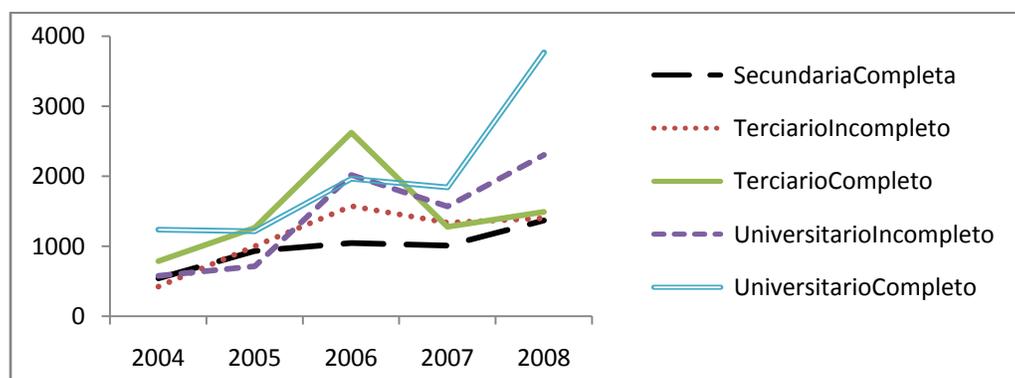
- a) **The curriculum is old and out of date**, often with little flexibility and heavily focused on theoretical learning. This is the single most mentioned concern about technical education by firms.
- b) **Students are not prepared when they graduate**, usually lacking theoretical and especially practical knowledge necessary to work successfully in their jobs. In the word of one manager "...there is not much difference between a recent graduate with no experience and an experienced unskilled worker."
- c) **Equipment and teaching material is old**, which means that students do not have practical experience using machinery and equipment that is currently used in the productive sector.
- d) **There is limited communication between TTE and firms.** Some employers expressed frustration that there was only limited dialogue between the TTE systems and themselves, making the system slow to respond to their needs.

The lack of work-ready TTE graduates may be partially driving employment dynamics. Faced with this situation, firms can either find an experience TTE worker to hire, hire more educated university graduates who lack specific qualifications but are seen as having better general cognitive skills, and/or dedicate significant effort and resources to train new employees in areas that should have been covered in the TTE institution. Although many firms prefer the former, experienced TTE workers are few and far between: over 55% of the skilled worker positions employers reported they were not able to fill required more than 3 years of work experience.

²⁰ Estudio para el Fortalecimiento de la Educación Superior Técnica en la Provincia de Buenos Aires," Comisión de Investigaciones Científicas, 2010.

Hiring either experienced TTE graduates or university graduates seems to be the preferred employment strategy, with favor to university graduates most recently. Figure 9 shows the average wages by education level in the construction sector between 2004 and 2008. It shows that while complete tertiary was very much demanded before 2006, once the available supply experienced TTE workers ran out, firms turned to workers with complete and incomplete university education.

Figure 9: Averages wages by education level in the construction sector



Source: World Bank calculations, from CIC pg. 196-197, based on data from household surveys and INDEC

An inadequately educated workforce was flagged by firms in the most recent Investment Climate Survey conducted in Argentina (2006). When asked to name all the constraints encountered in their business operations, a higher share of firms in the Province considered issues as major or severe constraints than in the City of Buenos Aires or at the national level. In fact, corruption, tax rates, political instability, macroeconomic instability, an inadequately educated workforce, and practices of competitors in the informal sector were mentioned as constraints by more than 50 percent of respondents in the Province, while their shares were significantly lower for the rest of the country and the City (with the exception of tax rates). The same obstacles affected exporting firms, although to a somewhat lesser degree.²¹

C. The Demand for Workers in the Province of Buenos Aires

The economy's cycles of booms and busts have lead to periods of high growth and sharp recession. Unemployment numbers have followed these trends. The Province of Buenos Aires has had a similar experience to the rest of the nation. In the first trimester of 2003, the *conurbano* de Buenos Aires had an unemployment rate of 23.1 percent compared to the national rate of 20.4 percent.²² In the second semester of 2010, the rates were 9.0 percent compared to 7.9 per-

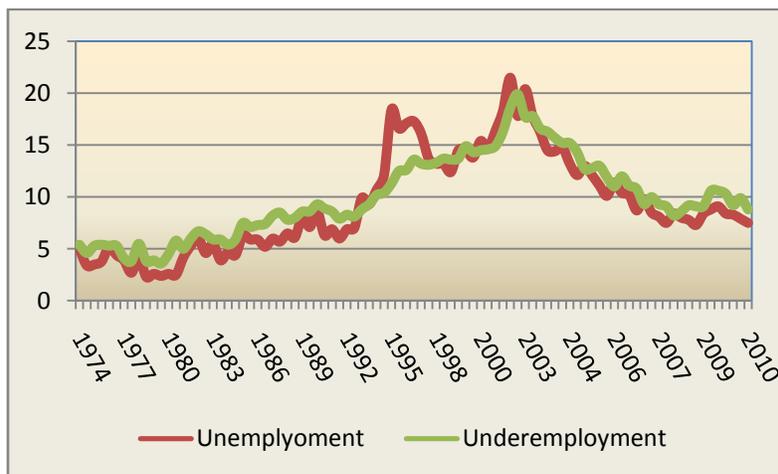
²¹ Argentina Economic Memorandum for the Province of Buenos Aires, The World Bank, draft.

²² There is no measurement of the provincial unemployment rate or labor participation rate, however INDEC has unemployment rates for the *conurbano* de Buenos Aires and the metropolitan areas of La Plata, Mar del Plata, Bahia Blanca-Cerri, San Nicolas-Villa Constitución, and Videma.

cent. The Province is slightly more vulnerable to economic changes than the country as a whole as it does not have a large agriculture sector (measured by GDP contribution) which might provide some stability, particularly in downturns.

Periods of high unemployment and underemployment have characterized the busts. Figure 10 shows the historic evolution of urban unemployment and underemployment in Argentina over the past three decades, using official time series. The unemployment rate has two major peaks—associated with the economic crises of the early 1990s and of the early 2000s. Although unemployment drops from its peak in the 1990s, it appears to continue its secular trend upward until around 2000. As per Figure 10, the economic crisis of 2001-02 left an as much as 40 percent of the workforce unemployed or underemployed, which is more than double the current level. Underemployment (workers working fewer hours than they would like) is a serious problem, generally matching the unemployment rate, except in the early 1990s. After the economic crisis of 2001-02s, it appears that unemployment has begun a long-term secular decline from its peak. While certainly the global economic crisis of 2008 has led to greater unemployment and underemployment in Argentina, it has not caused the same level of high unemployment as in past economic recessions.

Figure 10: National Urban Unemployment Rate



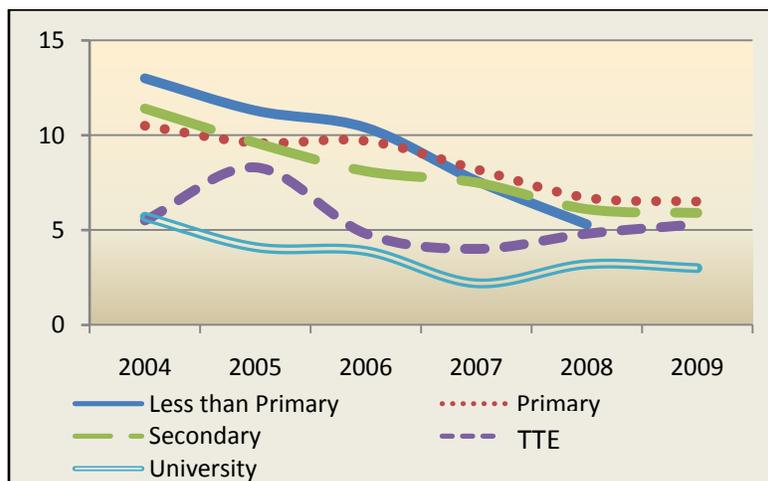
Source: CIC, 2010

The size of the country’s labor force has also fluctuated with the economy. Unemployment and underemployment only measures the employment situation of those who consider themselves in the workforce. The size of the workforce also changes due to economic factors. When unemployment is high, many “marginal” workers will drop out of the workforce. Likewise, when the economy is strong, many non-workers (those previously not part of the labor force) will enter the workforce looking for jobs. From 2004 to 2009, salaried workers increased by 28 percent while independent workers increased by 6 percent. Overall, the manufacturing sector grew the fastest in terms of demand for workers. In the *conurbano* of Buenos Aires, participation in the workforce remained relatively stable in the past decade, with an overall participation

rate of 46.5 percent in 2003 and 46.6 in 2010. However, in the same period, the employment rate (the percentage of the population with salaried employment as opposed to independent work) rose from 35.8 percent in 2003 to 42.4 percent in 2010. In other words, 23 percent of those who were employed in 2003 did not have formal jobs compared to only 9 percent in 2010. The trend is seen in other metropolitan areas in the Province.

In the Province of Buenos Aires, the impact of unemployment differs greatly depending on education level. While it is common to hear concern expressed about highly educated individuals who are unable to secure employment, the reality is that unemployment is usually a problem that affects the workers with less education. Of course, this does not mean that educated workers are getting the “right” jobs given their education. They may be doing a job below their education level. This poor skills matching may be the result of a failure in the education system—either because graduates do not get appropriate skills and thus cannot be placed in their field of training or because higher educated workers are needed to fill jobs that less educated workers could carry out. There may also be structural problems in the labor market that go beyond the education system. In this case, there may not be enough jobs for all educated workers and employers have the “luxury” of hiring workers over-educated for their position. Figure 11 shows the unemployment rate by education level in the Province of Buenos Aires and the following paragraphs show how these issues play out there. As per the previous section, employers had significant vacancies for skilled positions. As employment increased after 2003, it appears employers did favor more educated workers, even when these might not have had the specific skills or training needed for the advertised position.

Figure 11: Unemployment Rate by Education Level



Workers with tertiary education have had lower unemployment rates than other workers. Starting out, in the Province of Buenos Aires university graduates have the lowest unemployment rate and their unemployment rate continued to fall in the past five years. While graduates of TTE had the same level of unemployment as university graduates in 2004, their unemploy-

ment rate did not fall as fast as university graduates. Consequently, during this period the unemployment rate of TTE graduates has essentially converged to the level of secondary graduates. At the same time, the unemployment rates of workers with primary and secondary education declined during the period of study. In summary, it appears that in 2004, workers with tertiary education had major advantage over other workers. By 2009, this advantage only applied to those with university education.

After the 2001-2002 crisis, salaries increased and wage differences by education declined.

Table 8 outlines the monthly wages as a percentage of the average wage in the urban areas of the Province by education level. Wages are reported in relative terms to control for inflation and to allow monitoring of the gap between different levels of education. The most important trend here is the decline in wages for university graduates, which dropped from 220 percent of the average monthly wage in 2004 to 168 percent of the average monthly wage in 2009. As employers began rehiring in 2003-04, they sought workers with complete TTE or university education. Wage premium to these two levels of education peaked in 2004. Subsequently, perhaps because of scarcity of good candidates from these two sub-segments of the labor market, workers with less education have been increasingly hired and wage differentials by education level have moderated.

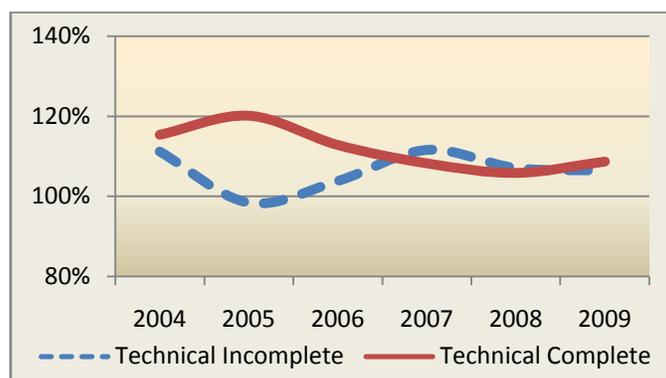
Table 8: Monthly wage as a percentage of average wage

Education Level	2004	2005	2006	2007	2008	2009
Less than primary	51%	48%	45%	48%	55%	53%
Primary	64%	67%	65%	68%	68%	67%
Secondary	95%	97%	100%	94%	99%	94%
TTE	115%	120%	113%	108%	106%	109%
University	220%	190%	192%	190%	173%	168%
Average (Pesos)	775	831	1,062	1,263	1,589	1,995

Source: CIC staff calculations, from data from household surveys and INDEC

The supply of highly qualified technical tertiary education graduates seems to be constrained. The trend in Table 8 shows that the wages of graduates of TTE have mostly kept their premium over those of secondary school graduates, with the peak difference in 2005. Since then gap between these two levels has declined slightly. Another important trend, which is reported in Figure 12, is the closing of the gap between TTE graduates and workers with incomplete TTE. Before 2007, there was a definite gap between TTE graduates and others who did not complete TTE. Such wage behavior is consistent with employers concerns about a limited supply of high quality TTE graduates—most of whom would have been rehired early in the resumption of growth in 2003-04. As the supply of high quality TTE graduates dried up, employers seem to have continued to seek “more educated” university graduates and to increasingly hire less educated labor at a higher relative cost. This again confirms employers’ opinion of TTE as producing too few of the type of graduates sought.

Figure 12: Wages for workers with TTE complete and incomplete



In theory, TTE should be a positive investment from the point of view of the worker. Completing tertiary education can be an expensive proposition for students. Even in a system without tuition, such as the case of public education in Argentina, students have to spend time away from the workforce (studying instead of working) just as they reach working age. While international evidence shows that education can be an excellent investment for youth and society, this is not true invariably in all circumstances. Table 8 outlines the evolution of pay by education level for workers over several years and shows a premium for workers with technical tertiary education compared to secondary graduates. This premium is smaller than the premium for university graduates. Since TTE graduates come principally from the ranks of the less academically accomplished secondary school graduates (recall the PISA scores with many 0 or 1 levels of proficiency), it makes sense that their wage premia would not be as high as those for university graduates.

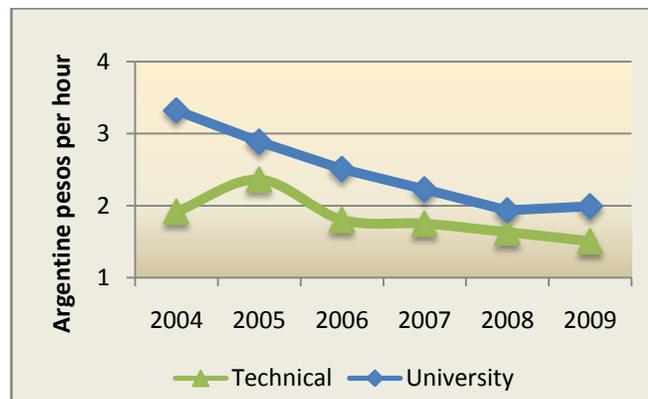
The wage premia of TTE graduates may be slowly eroding. While Table 4 outlines the broad trends in wages by education in the past decade, it does not control for the changing characteristics in the labor force besides education (for example, changes in experience) or new developments in the economy (such as increased external demand for the Province’s products or changes in tax policy). CIC (Comisión de Investigaciones Científicas, 2008) prepared detailed analysis of wages in the Province of Buenos Aires using techniques similar to the well-known Mincer model (Mincer, 1974). The model estimates the impact of various characteristics on the hourly wage in 2009 constant pesos for urban workers in the Province of Buenos Aires. It controls for working in five different areas of the economy: food and drinks production, textiles and related products, chemicals, metal and machinery production, and other sectors. Some of the principal conclusions of this analysis include:

- a) Being employed in certain sectors is advantageous because it can have a positive impact on wages. The most lucrative sectors are the “modern” service sector (largely in the financial sector), transportation, and public services. The modern service sector has long taken the cream of professional talent and the wage premium may reflect this. The transportation and public administration traditionally have had unions that may have contri-

buted to a higher wage for workers. In addition, the transportation sector traditionally has long hours and a difficult work schedule which may contribute to the higher wages. Other job sectors with modest premia include commerce, industry, and social services.

- b) Contrary to the results seen in most other countries, age and experience do not have a positive linear correlation with wages. In fact, it appears the relationship is quadratic—workers’ wage increases with age until they peak at a certain age (around 45 to 50 years, depending on the analysis) and then starts to decrease.
- c) Within urban zones in the Province of Buenos Aires, there appears to be little geographic differentiation. Controlling for other factors, workers in the Bahia Blanca region appear to earn a slight premium over workers in the rest of the Province, but the effect is minimal. There appear to be no other geographic difference.
- d) The largest wage premia (over workers with no education) go to graduates of TTE and universities, as shown in Table 8. Over the period of study, it is clear that this premium has been declining both for university graduates and for TTE graduates, with university graduates appearing to be biggest losers (see Figure 13). This is broadly consistent with previous results that show lower educated workers “catching up” and raises questions about the numbers of qualified graduates with relevant skills coming out of higher education. It seems that “choice” employees were TTE graduates with experience and some university graduates, but as production continued to expand (post 2006) employers were increasingly indifferent to formal education and degree qualifications.

Figure 13: Wage premium (in Argentine pesos per hour) by education level



- e) Controlling for a variety of factors, men earn more than women. On average, they earn between 1.20 and 1.48 pesos more per hour. This trend remains holding other factors into account such as choice of industry, choice of occupation, or education level. Although

there are no clear time trends, it appears that the gap between men and women has increased during the economic recovery.

The overall analysis paints a complicated picture on the economic value of technical education in the Province of Buenos Aires. One general conclusion from the analysis here is that the market does not reward TTE particularly well and that the premium given for higher education appears to be declining with time. This seems to support the hypothesis that university graduates are increasingly doing work that is more appropriate for TTE graduates and as such, earning less than their potential. The proposed explanation for this is a perception among employers of the steep decline in value of a TTE graduates once the “choicest” have been hired; employers seem to prefer to “bet” on the higher general skills of university graduates and attendees than hire from the heterogeneous pool of “mid-level” TTE graduates and attendees.

D. Conclusions

Before 2005, TTE in the Province had been neglected for decades from a financial, managerial and a policy perspective. This resulted in TTE with poor quality and labor market relevance, outdated technology, insufficient infrastructure, high drop-out rates, and a declining market share vis-à-vis private TTE providers. Labor market outcomes reflect this deterioration: TTE workers post-crisis have experienced a slower reduction in unemployment and generally declining wages. Employers, frustrated with the lack of well-trained skilled workers, seemed to have turned to university-trained professionals when the TTE graduates should be sufficient.

The National Fund for Technical and Professional Education helped stop the neglect, but there are still many concerns with the operation, efficiency and policy direction of the TTE system today. There a few students per institutions, suggesting large overheads and negligible economies of scale, and increasing teacher salaries that limit the amount of budget left over for investment. As TTE oversight is split across three agencies, responsibility for system quality, relevance and effectiveness is diffuse. Further complicating matters, a tight deadline on the national education spending target has distracted policy makers from making necessary and overdue structural reforms.

The TTE System in PBA appears to have pockets of excellence but appears to falls short of providing many of its graduates with salable skills. Evidence from the post-crisis recovery of the mid-2000’s suggests that the best TTE graduates—when they also have reasonable work experience—are highly sought after by employers. Once the limited supply of these graduates is exhausted employers tend to favor workers with complete or incomplete university studies rather than second-tier TTE graduates. This suggests a complex consideration on the part of employers regarding the relative value of the specific skills imparted by TTE versus the more general cognitive capacities that one associates with university education. This phenomenon also suggests a disconnect in either the relevance of the TTE curriculum, or the ability of TTE to “add value” for all but the top TTE students, or some combination of these two factors.

Demand for technical skills remains high and employers experience significant difficulties filling their openings for skilled workers. Firms report they cannot fill over 40 percent of their skilled positions, and more in specific sectors. In the opinion of many employers, the education received by graduates of TTE is not adequate for the needs of the modern workforce. This perception is borne out by data on unemployment and by the most recent Investment Climate Survey. This reinforces the perception that the outputs of the TTE system only partially satisfy the labor market; there appears to be a persistent, structural demand for technical skills that are not easily available to employers.

The TTE appears to be a second-choice option for many students. Both the high dropout rates from TTE and the fact that many students only enter the system after first “trying out” university education suggests that a significant number of students are in TTE by default rather than by explicit choice. It is plausible that such students, even if they graduate, do not signal strong labor market value to employers. This may be because they have not acquired specific skills or because employers do not value their perceived combination of technical, general cognitive and soft skills. The TTE system as a whole appears not to have the policy mechanisms in place to properly diagnose and address this more complex set of skills that employers seem to be seeking.

When the private sector cooperates authentically, the quality and relevance of TTE increases. Neither the overall institutional structure of TTE nor the existing incentive system promotes widespread, high quality interactions between firms and TTE institutions. Such collaboration exists, but it is the exception. Moreover, it seems that it is most effective when it is facilitated by an external agency, such as the CIC. The catalytic role of the CIC in bringing together TTE partners around problems of relevance to firms, researcher, and technical educators appears to be able to overcome normal barriers to cooperation. It would be worthwhile to test the extent to which this catalytic role can be scaled up.

6. Recommendations

The dynamics of the TTE system by itself and in conjunction with labor markets are complex but suggest overall difficulties in meeting the systems basic mandate: to produce graduates with highly-demanded technical skills. This report has not been able to exhaustively diagnose the factors responsible for this, but some clear themes emerge for policy and for the direction of further diagnosis. The recommendations below should be accompanied by additional analyses that more completely uncover the sources of the system's deficiencies. Five main recommendations present themselves. Some of these could be a top priority for PBA authorities, while others could be desirable to accomplish in the future. In addition, while some of the recommendations can be implemented in a short span of time, others that are more strategic in nature will take a longer time to complete. These differences are noted next to each recommendation and summarized in Table 9 at the end of the section.

Recommendation 1: Improve incentives for private sector involvement with more focused TTE programs. Firms have jobs to fill, yet it is the exception that they cooperate with the system that is supposed to be training their future employees. As the TTE system focuses more closely on its core mandate, additional incentives should be created for firms to collaborate with TTE institutions. These incentives should be partially financial or monetary, and partially based on access to expertise and problem solving opportunities that emanate from the TTE curriculum. The private sector could become actively involved in curricular design, joint research initiatives and student internships, for example. Under appropriate supervision, through industry internships students may see and learn to use updated technology and tools. Joint research initiatives may result in market-ready innovations that are useful for the company and provide a revenue stream for the institution. This is a top priority recommendation which can be implemented in a relatively short period of time.

Recommendation 2: Reexamine student support policies. Two recent trends suggest that the financing policy may be misaligned. First, despite the fact the public TTE institutions do not charge tuition, students are showing a greater preference for private TTE institutions that do charge. Second, most students work and study at the same time. Although directors of the public institutions who were surveyed by CIC say economic reasons are the primary drivers of dropout (see Chp.4, section E), little is known about the scope or breath of students' financial burdens. Evidence from other countries in the region—especially Chile's State Guaranteed Student Loan Program and Colombia's ACCES program²³—suggests that proper student aid policy can significantly reduce dropout. This policy may involve loans rather than grants for living expenses and does not need to be confined only to public institutions. The Provincial Government should consider reexamining student support policies as a part of a revamped TTE system. This is a top priority recommendation whose implementation will take a long time to complete.

²³ The World Bank supported student loan project called Access to Quality Higher Education

Recommendation 3: Create a policy for remediation of general skills and consider implementing this as a separate stream in post-secondary education. The TTE system is burdened by trying to provide up-to-date concretely relevant skills to its best students while needing to serve the needs of many who end up in the system by default. The system is not designed to simultaneously address deficiencies in secondary education and provide first-rate technical tertiary education. The Government of PBA should consider developing a post-secondary stream devoted to remediation and “second chance” education. Such as stream could separate out students who are pursuing specific skills in TTE from those who seek to continue their education generally and make up for poor secondary schools experiences. This is a top priority recommendation whose implementation will take a long time to complete.

Recommendation 4: Raise the profile of TTE above its traditional position as subsidiary to general education. Technical tertiary education is burdened by its past as a “last option” for post-secondary education. A more proactive policy might allow the system to expand its successful components while redirecting unsuccessful students to more appropriate education, training, or immediate labor market options. The first step in moving to such a system is to raise the profile of TTE above its traditional position as subsidiary to general education. This is a desirable recommendation whose implementation ought to be ongoing.

Recommendation 5: Promote the congruence of research policy and technical education within the Province of Buenos Aires. PBA enjoys a strong and capable research community and the Provincial Government sponsors research on problems relevant to economic growth and productivity. Initial attempts by the *Consejo de Investigaciones Cientificas* to ensure maximum “return” to these investments by connecting their content and research to the TTE system is a sound initiative that has produced worthwhile results. ISETA is an example of this (see box in Chp.4, section F). It would behoove the Provincial Government to consider how this relationship can be consolidated institutionally and how it can be expanded in practice. An overall policy that promotes the congruence of research policy and technical education will strengthen both domains and help solidify the relevance of both systems to key economic challenges. This is a desirable recommendation whose implementation will take a long time to complete.

Some of the elements that should be included as part of a structural TTE reform are:

- ***Developing a more robust information system.*** Good policy and management decisions are hard to make in the absence of accurate data. Information systems help measure the impact of reforms, monitor system performance, and track the labor market outcomes of graduates. Investments in information systems ultimately increase accountability and payoff several times over. This is a top priority recommendation whose implementation ought to start soon and continue over time.
- ***Revising TTE system expenditures.*** Rationalizing the number of TTE institutions across the Province may potentially increase economies of scale while preserving territorial and

subject-matter coverage. Equally important, an employment pact with teachers—if at all politically viable—may help stabilize future salary growth. The revision of system expenditures is a top priority recommendation which can be completed in a relatively short period of time. It is important because it can shed light on areas of major cost savings. The implementation of these cost saving actions will undoubtedly be a long-term process.

- ***Diversifying sources of revenue.*** TTE institutions should be encouraged to decrease their dependence on public resources. They can do this by partnering with the private sector, selling specific consulting and research services, selling space in their facilities during off hours, and applying for special grants as available. ISETA may serve as a good example to follow in this regard, as it has successfully expanded its revenue sources. This is a desirable recommendation whose implementation will be an ongoing process as diagnoses are made and changes implemented.
- ***Emphasizing empirical over theoretical learning.*** This necessarily requires investing in up-to-date equipment and tools. This is a top priority recommendation which can be implemented in a relatively short period of time. It is important because it will provide graduates with work-ready skills.
- ***Decreasing drop-out rates.*** A major effort on this front is suggested. Students should not feel TTE is a poor use of their time, and institutions should not spend scarce resources and space on those who will not graduate. Steps in this direction are listed below. All recommendations are based on research conducted by the CIC with directors of public TTEs; some are part of broader recommendations mentioned earlier.
 - Condition part of the resources tertiary institutions receive on graduated students (as opposed to admitted students).
 - Career orientation for students new to tertiary education. The bulk of this can be one-size-fits-most online material.
 - Flexible timing for courses and degree programs. Students should take tertiary education at their own pace. This means as little as one class per semester. This also means online lectures and virtual platforms with class materials.
 - Explore how the family reasons that contribute to student dropout can best be addressed.
 - Financial aid to help students bear the opportunity cost of education.
 - Remediation and leveling classes for those with deficient secondary education.

Some of these reforms can help finance part of other ones. Cost savings should result from revising and rationalizing system expenditures. Additionally, conditioning resources to results—

rather than to inputs—will encourage the various parts of the TTE system to be more efficient and to stay focused on the end goal.

Equally important, part of the 6 percent of GDP the Province must spend on education should go to TTE. The latter is enough to produce top quality education outcomes and should be invested accordingly. The Province can and should aim to have a high achieving technical tertiary education system; anything less would fall short of its potential.

Table 9. Prioritization of Recommendations

	Long-term (implementation takes place over a long period of time and actions are more strategic in nature)	Short-term (implementation takes place over a short period of time)
Top priority	<ul style="list-style-type: none"> - Create a policy for remediation of general skills and consider implementing this as a separate stream in post-secondary education. - Reexamine student support policies. - Develop a more robust information system 	<ul style="list-style-type: none"> - Improve incentives for private sector involvement with more focused TTE programs - Revise TTE system expenditures. - Emphasize empirical over theoretical learning - Provide flexible timing for courses and degree programs
Desirable for the future	<ul style="list-style-type: none"> - Raise the profile of TTE above its traditional position as subsidiary to general education. - Promote the congruence of research policy and technical education. - Diversify sources of revenue for public TTEs. 	<ul style="list-style-type: none"> - Make a significant effort to decrease drop-out rates. Among other already mentioned actions, this may include: (i) Career orientation for students new to tertiary education; (ii) conditioning part of the resources TTEs receive on graduated students; and (iii) exploring how the family reasons that contribute to student dropout can best be addressed.

7. Bibliography

- Comisión de Investigaciones Científicas. (2010). Estudio para el Fortalecimiento de la Educación Superior Técnica en la Provincia de Buenos Aires. La Plata.
- Gil, I., Fluitman, F., & Dar, A. (2000). Vocational Education & Training Reform. New York: Oxford University Press.
- Hanushek, E., & Woessmann, L. (2010). *How Much Do Educational Outcomes Matter in OECD Countries?* Cambridge, MA: NBER.
- Mazeran, J. (2007). *Short-Term Vocational Higher Education*. Paris: Hachette Education.
- Mikhail, S. (2008). *The Alternative Tertiary Education Sector: More than Non-University Education*. Washington, DC: World Bank.
- Mincer, J. (1974). *Schooling, Experience and Earnings*. New York: National Bureau of Economic Research .
- World Bank. (2010). *Economic Memorandum for the Province of Buenos Aires: Key Public Policy Issues*. Washington: World Bank.