Human Capital Investment in Argentina: Trends, Challenges, and Policy Implications

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Abstract

This paper presents an empirical analysis of the current labor situation in Argentina for the purpose of estimating the returns to education. The methodology involves estimating Mincer equations and computing the returns both under the hypothesis of linear returns for years of education and by the highest level reached. The data comes from the Permanent Household Survey (EPH-INDEC) corresponding to the first quarter of 2022. The results show: (1) A return to education of 8% for 2022; (2) A decreasing trend in returns to education over the last two decades, although a growing trend in average years of schooling.

1 Introduction

The decision to pursue education is often viewed as an investment in human capital, yielding numerous benefits such as higher wages, lower unemployment rates, better health outcomes, and improved human capital for future generations (Becker, 1964). Jacob Mincer (1974) further revolutionized this field by developing an econometric methodology to estimate the returns to education, a framework that has been extensively applied globally. The returns to education, however, vary significantly across contexts, ranging from a 1.6% increase in wages per additional year of education in Afghanistan to 22.4% in Rwanda (Montenegro and Patrinos, 2014).

Argentina presents a unique case for studying the returns to education due to its high public expenditure on education relative to GDP and its susceptibility to economic fluctuations as an emerging economy. This study aims to analyze the returns to education in Argentina for the year 2022 and the period from 2004 to 2022, using microdata from the Permanent

Household Survey (EPH-INDEC). Despite the importance of this topic, no recent studies have thoroughly examined this specific dataset to explore temporal changes in educational returns in Argentina.

Our findings reveal a paradox: while the average years of schooling have increased, the returns to education have declined. In 2022, the return rate to education was 8%, and the return to experience was 3% per year. This decreasing trend in returns to education, juxtaposed with increasing educational attainment, warrants a deeper investigation into the underlying causes.

One plausible explanation for this trend is the historical context of educational reforms in Argentina during the 1990s [1]. These reforms aimed to improve institutional frameworks but ultimately led to more accessible grade progression, potentially lowering overall educational quality (Tedesco and Fanfani, 2001). Consequently, as more individuals attain higher levels of education, the marginal return to an additional year of education may diminish, particularly if the quality of education is perceived to be lower.

Another significant factor is the "brain drain" phenomenon. With Argentina's average labor income being as low as $300, highly educated individuals are incentivized to seek better opportunities abroad. This emigration of skilled labor to destinations such as Spain, Italy, and the United States exacerbates the decline in domestic returns to education. The rise of remote work has also facilitated the movement of Argentina's human capital to global markets, further impacting domestic wage structures.

Understanding whether the reduction in returns to education is a cause or a consequence of "brain drain" is crucial. It raises the question of whether the most qualified individuals leave due to better returns abroad or whether their departure leads to diminished returns at home. Future research should consider detailed migration data disaggregated by educational level to elucidate these dynamics.

In Section 2, the theoretical framework will be introduced, explicitly stating the model used, and providing a brief literature review on what human capital is, its implications for economic development, and previous estimates of returns to education in Argentina and worldwide. Section 3 will address the situation of the Argentine labor market and the income distribution disaggregated by educational level. Section 4 will discuss the returns to education, introducing the model and addressing certain methodological issues in working with the data. Finally, Section 5 will present the results and Section 6 will provide the conclusion.

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[1] Law No. 24.195 (Federal Education Law, 1993) and Law No. 24.521 (Higher Education Law, 1995).

2 Theoretical Framework

The human capital hypothesis suggests that the training acquired by individuals, whether through formal or informal education, constitutes capital, and the process through which this capital accumulates is investment in education or knowledge. The main exponents of this theory were Gary Becker (1964), Jacob Mincer (1974), and Theodore Schultz (1961). In strictly economic terms, investing in human capital by spending time on formal and informal education implies a sacrifice of present consumption to improve the profile of expected future income (or permanent income), which can enhance future consumption capacity (Coremberg, 2010).

Empirical evidence shows an undeniable positive and significant relationship between educational level and labor income. Consequently, the question dividing the literature in the economics of education concerns why a person who has invested more in education receives a higher income flow over their lifetime than another, identical in all other aspects, but who has invested less. Pioneers in this field argue that education increases worker productivity, which, under certain assumptions about the labor market structure, positively impacts the income they receive. In summary, individuals earn more because they are more productive, and what makes them more productive are these skills and knowledge called human capital (Paz, 2009). This human capital theory assumes that the amount of education, s, is chosen to maximize the expected value of future income flows, w, until retirement, T, net of educational costs, c_s. Thus, the optimal s is the one for which the marginal income from an additional year of education equals the marginal cost of that year (Adrogue, 2006). At the optimum:

$$\sum_{t=1}^{T-s} \frac{w_s - w_{s-1}}{(1 + r_s)^t}$$

where r is the rate of return. If T is sufficiently large, the left side of the equilibrium relation can be approximated so that the equilibrium condition translates to:

$$\frac{w_s - w_{s-1}}{r_s} = w_{s-1} + c_s$$

If c_s is small enough, the expression can be rearranged to obtain:

$$r_s \approx \frac{w_s - w_{s-1}}{w_{s-1}} \approx \log w_s + \log w_{s-1}$$

The returns to s could be estimated by analyzing how the logarithm of incomes varies with s. One of the initial empirical evaluations of these returns was by Jacob Mincer (1974), who proposed an equation relating income (W_i) with years of education (s_i), experience

(X_i), squared experience (X_i^2), and other observable variables affecting income, different from experience and education (X_i). The term for squared experience was incorporated to capture the concavity of the income profile, meaning that incomes increase with years but at a decreasing rate.

$$\ln W_i = \alpha + \beta_1 S_i + \beta_2 X_i + \beta_3 X_i^2 + \mu_i$$

where the term μ_i is a random disturbance term representing all unobservable variables not explicitly included in the equation that affect individual incomes.

Criticisms of this approach come from various sources. A body of work primarily from the first half of the 1970s has criticized the human capital hypothesis, arguing that while education and monetary income are highly correlated, it could be a spurious relationship. For example, innately more able individuals might study more and remain longer (desert less) in the educational system precisely because they are more able than others. Similarly, that innate ability could make them more productive in their jobs, thus positively impacting their monetary incomes. In other words, it is the innate ability that drives individuals to study more and also makes them more productive and earn higher incomes (Griliches, 1977; Card, 1994).

However, if this were indeed the case, it still leaves unanswered why more able individuals incur the cost of accumulating human capital if the market rewards their ability and not the acquired education. Arrow (1973) and Spence (1973), among others, noted that investing in education is one of the least costly ways for both individuals and firms to resolve an information asymmetry problem in the labor market. Employers do not know the productivity of the workers they hire and use indicators and signals to detect that productivity. More productive workers find in education an important signal to differentiate themselves from less productive workers. Moreover, the cost of producing that signal is inversely related to the agents' capability, so it may be profitable for more productive workers to invest in generating it.

From a macroeconomic perspective, education plays a fundamental role in an emerging country's ability to absorb modern technology and develop sustainable growth and development capacity. Indeed, education and health are much higher in higher-income countries, and causality likely runs in both directions: with higher incomes, both individuals and the government can spend more on education and health, and with better education and health, productivity and incomes improve. Thus, as a public policy, the strategy should simultaneously focus on income, health, and education (Todaro and Smith, 2020).

Just like physical capital, after the initial investment, higher future income flows result from improvements in education and health. Therefore, the rate of return can be deduced

and compared with that of other investments. This is estimated from the present discounted value of the possible income increment due to the investment and compared with direct and indirect costs.
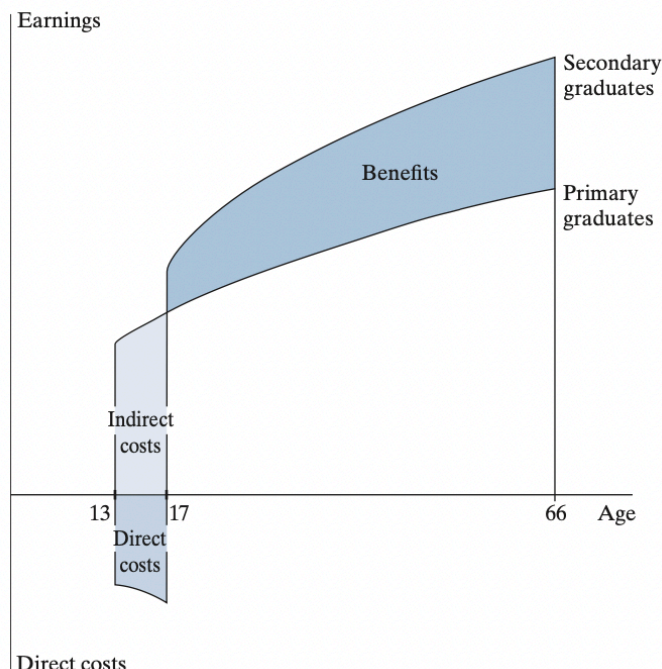

Figure 1: Direct and Indirect Costs and Benefits of Education

Typically, in emerging countries, the social costs of education (the opportunity cost to society as a whole arising from the need to finance the expansion of higher levels of education when those resources could be used more productively in other sectors of the economy) increase rapidly as students reach higher educational levels. In contrast, the private costs of education, which are those paid by the students themselves, increase less sharply (or could even decrease). This gap between social and private costs provides more incentives to demand advanced education compared to basic education. However, the opportunities can only accommodate these distorted demands at the complete social cost.

As illustrated in Figure 2, social benefits increase sharply at first, reflecting higher productivity levels due to literacy and basic arithmetic skills. Then, the marginal social benefit of each additional year of education increases more slowly, and the social returns curve stabilizes. In contrast, social costs increase slowly for elementary levels of education and much more rapidly for advanced levels. This rapid increase in the marginal social cost of post-primary education results from much more expensive capital and current costs of advanced education (infrastructure and equipment) and the fact that post-primary education in emerging countries is highly subsidized.
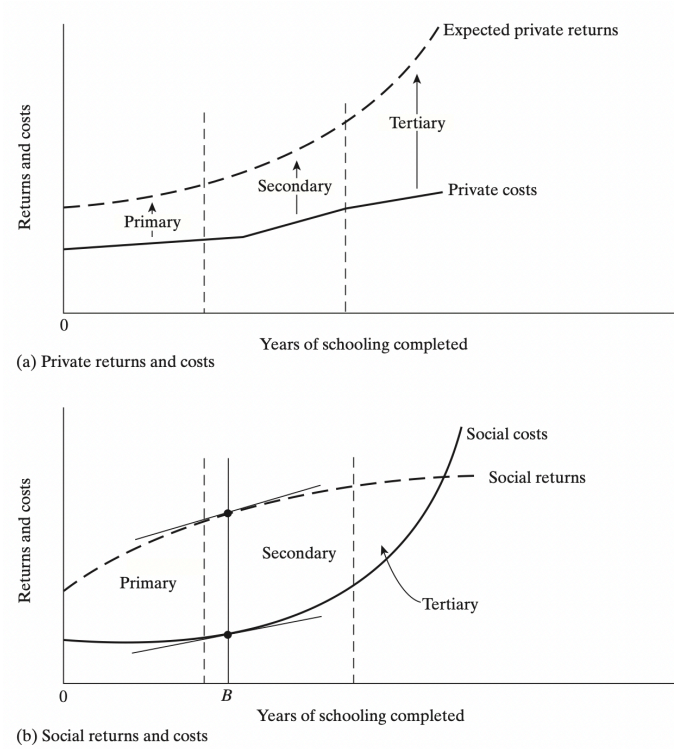
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(a) Private returns and costs

(b) Social returns and costs

Figure 2: Returns and Costs of Education

The following table shows the returns to education in different regions:

Region	Total	Male	Female
Sub-Saharan Africa	12.5	11.3	14.6
High income economies	10.0	9.5	11.1
Latin America & Caribbean	9.3	8.9	10.8
East Asia & Pacific	9.0	8.8	9.7
Europe & Central Asia	7.8	7.4	9.8
South Asia	7.2	6.3	9.2
Middle East & North Africa	6.5	6.0	10.2
All economies	9.7	9.1	11.5

Note: The numbers represent the rate of return, as a percentage increase in earnings, to another year of schooling. It is a private rate of return, in the sense that the only costs controlled for are the opportunity costs of not working while in school.

Source: Montenegro, C. E., and H. A. Patrinos. *Comparable Estimates of Returns to Schooling around the World*. World Bank Policy Research Working Paper No. 7020, 2014 [7].

Figure 3: Returns to Education by Region

As shown in Table 1, there is empirical evidence of differences in returns to education between men and women. On the one hand, women have higher returns to education than men in most developed countries. This can partly be explained by the fact that with fewer women enrolled, the marginal woman who enrolls tends to be more talented than the marginal man. Increasing women's education not only raises their productivity and wages but also increases

female labor force participation, marriage rates, reduces fertility, and greatly improves the health and nutrition of children, thus benefiting future generations as well (Borjas, 2020).

3   The Argentine Labor Market

This section aims to empirically show that higher educational levels correspond to higher incomes and lower inequality. To achieve this, a quantitative analysis[2] of data from the Permanent Household Survey (EPH-INDEC) of the first quarter of 2022 was conducted.[3]

3.1   The Permanent Household Survey

The Permanent Household Survey (EPH) is a national program of systematic and permanent production of social indicators carried out by the National Institute of Statistics and Censuses (INDEC), which provides knowledge of sociodemographic and socioeconomic characteristics of the population. It is conducted jointly with the Provincial Statistical Offices (DPE). Its primary objective is to characterize the social situation of individuals and families considering their insertion modalities into the economic-social structure. It provides the official rates of activity, employment, unemployment, and underemployment, as well as poverty and indigence indicators and other results on the socioeconomic characteristics of the population.

In terms of its geographical coverage, it encompasses 31 urban agglomerates where approximately 70% of the urban population of the country resides. It covers all provincial capitals and urban agglomerates with over 100,000 inhabitants. Its periodicity is quarterly, generating four estimations per year of the main labor market indicators.

Additionally, the EPH is a sample survey. This means that to understand the various characteristics of the total households, a small representative fraction is surveyed. All samples have limitations, sampling errors, which occur because observations are made only on a sample and not the entire population.

Households to be surveyed are selected randomly in two selection stages:

1. Within each agglomerate, a number of census districts or subdivisions of them (areas) are selected.

2. All private dwellings in the selected areas are listed, and from that list, a random selection of dwellings is made. The households living in those dwellings are the ones to be surveyed.

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[2]Quantitative analysis code available at https://github.com/miriammalament22/development

[3]The EPH is updated every six months, and the survey from the first quarter of 2022 was the latest available at the time of starting the quantitative analysis in November 2022.

Thus, there is a 2-2-2 rotation scheme (the dwelling is included for two consecutive quarters - rests for two consecutive quarters - returns to the sample for two consecutive quarters).

3.2   Income and Education Distribution

We can empirically analyze the distribution of income using income data provided by the EPH. However, two precautions must be taken. On one hand, 75% of employees declare their labor income, and on the other hand, there tends to be underreporting, especially in the upper income stratum.

In Figure 4, the distribution of labor income (P21) in Argentina weighted by PONDIIO (weight for labor income) can be observed. The distribution has its mode skewed to the left.

It is relevant to highlight that the average income is around $50,000. Considering the parallel dollar rate at the beginning of 2022 (1 USD = $180 ARS), the average labor income was below $300.
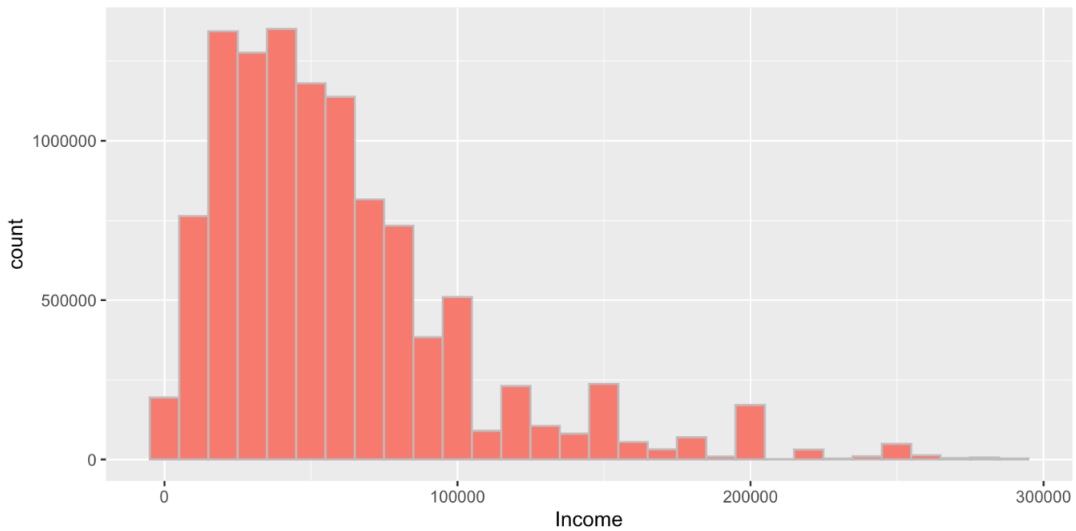

Figure 4: Income distribution

For the purposes of this work, it is necessary to disaggregate the income distribution in such a way as to demonstrate that the higher the level of education achieved, the higher the average salaries. Therefore, we can disaggregate the histogram of Figure 6 by educational level, as shown in the following figure:

From Figure 5, it can be concluded that the higher the level of education, the more the income distribution resembles a normal distribution. This means that higher levels of education lead to less inequality.

This conclusion is strengthened when disaggregated by gender, as shown in Figure 7. Interestingly, if there were a wage gap between men and women, the higher the level of
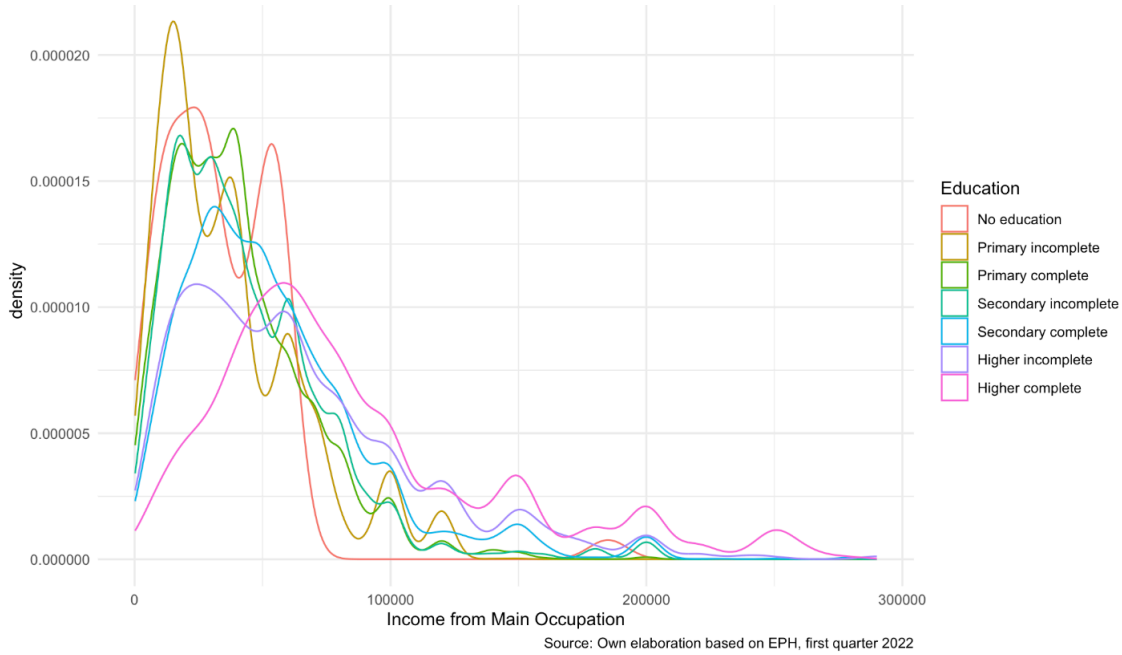
Figure 5: Income distribution by educational level

education, the smaller this gap.

Table 2 represents average salaries (distinguishing between those who finished the level or not), frequency (the percentage of the total of people of that gender who reached that level of education), and completion rate (the percentage of the total people of that gender who completed that educational level compared to the total who reached that level).

Educational Level	Average Salary		Frequency		Completion Rate	
	Completed	Not Completed	Male	Female	Male	Female
Primary	$23,476	$2,985	27.4%	26.8%	19.0%	22.8%
Secondary	$32,000	$16,338	46.8%	39.8%	24.4%	25.7%
Tertiary	$45,549	$30,563	6.7%	13.4%	18.1%	46.9%
University	$70,509	$37,283	17.9%	18.7%	20.4%	25.4%
Postgraduate	$86,021	$87,140	1.2%	1.3%	41.5%	35.3%

Table 1: Salary Analysis by Educational Level

The first relevant conclusion is that finishing the educational level always generates an increase in income compared to not finishing it. This can be explained by the signaling model outlined in the theoretical framework: finishing the level sends the signal that the worker is more productive.

Regarding the columns of frequency and completion rate, it can be concluded that women tend to educate themselves more than men since women more frequently attend tertiary and
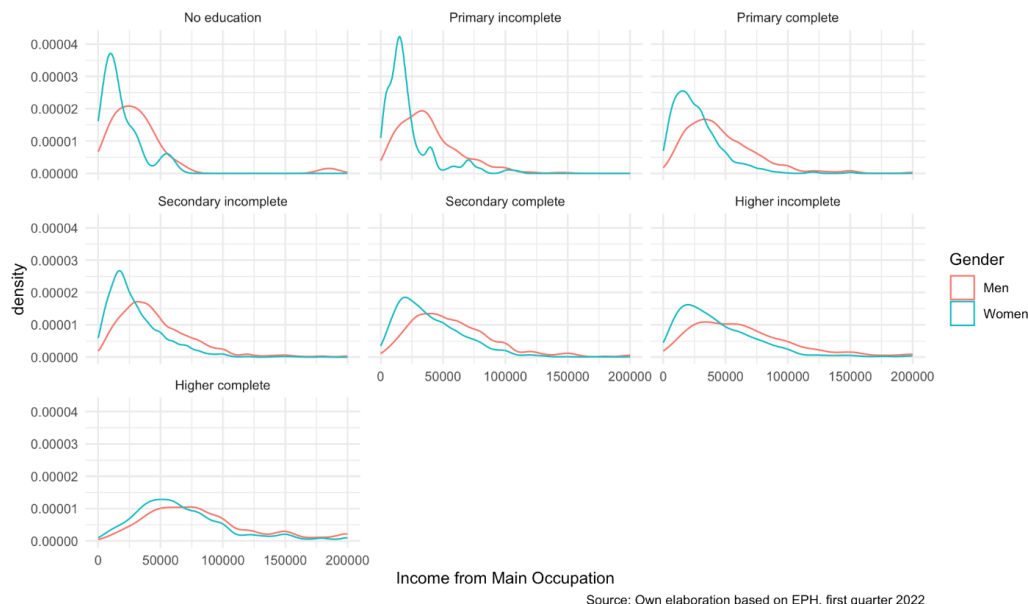
Figure 6: Income distribution by education and gender

university levels, and their completion rate is higher. Nonetheless, for postgraduate studies, the frequency difference is practically the same, although the completion rate for men is slightly higher.

It should be clarified that completing postgraduate studies does not make a significant difference in the sample. This may be because merely starting a postgraduate program is a strong enough signal to receive a higher salary.

Regarding the discussion of the wage gap by educational level, Table 3 was constructed to understand the dynamics between average salary and hours worked by gender. One of the main conjectures presented is that women earn less on average, but they also work fewer hours.

Educational Level	Average Salary		Hours Worked		Total Population
	Male	Female	Male	Female	
Primary	$11,657	$19,116	36.17	28.81	1,394,551
Secondary	$24,511	$32,649	39.65	31.40	2,219,722
Tertiary	$40,001	$57,152	35.11	25.88	524,596
University	$52,109	$59,978	35.71	32.00	943,746
Postgraduate	$86,302	$90,965	35.07	30.03	64,938

Table 2: Salary Analysis by Educational Level

Empirically, it is indisputable that the higher the educational level achieved, on average, the higher the income. However, the marginal cost of spending an additional year on

education is not taken into account. As indicated in the theoretical framework, it is not only about direct costs such as tuition or fees but also the opportunity cost which becomes progressively greater. Therefore, the next section will aim to calculate the marginal return of each additional year invested in education.

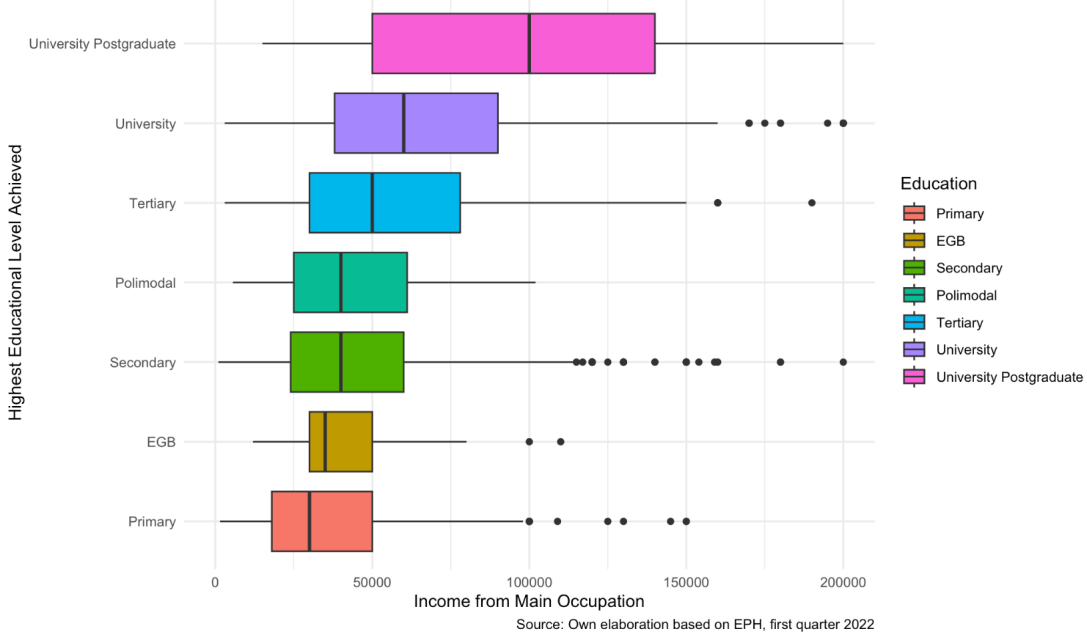Thus, to address the next section, it is essential to keep the following graph in mind.

Figure 7: Income by highest level of education achieved

4 Returns to Education

4.1 The Model

Following Mincer (1974), the natural logarithm of earnings is a function of education and labor market experience:

$$LnW_i = \alpha + \beta_1 S_i + \beta_2 X_i + \beta_3 X_i^2 + \mu_i \tag{1}$$

where LnW is the natural logarithm of the hourly wage for the i-th individual; S_i are the years of education; X_i is the labor market experience calculated as age - average years of education - 6; X_2 is the squared experience and μ reflects unobserved skills.

Thus, β_1 can be interpreted as the average returns to education (Chiswick, 1998).

Returns to education can also be estimated by the level of education achieved [4]. This

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[4]This model is based on Fiszbein, Giovagnoli, and Patrinos (2007)

can be done by using binary variables representing the educational level.

$$LnW_i = \alpha + \beta_1 edupc_i + \beta_2 edusi_i + \beta_3 edusc + \beta_4 eduui_i + \beta_5 eduuc_i + \beta_6 X_i + \beta_7 X_i^2 + \mu_i \ (2)$$

where edupc, edusi, edusc, eduui, eduuc refer to dummy variables for complete primary education, incomplete secondary education, complete secondary education, incomplete higher education, and complete higher education respectively. Incomplete primary education is not included as it is the regressor.

Then, *edupi* takes the value of 1 if primary school was not completed or no education was received (6 years or less); *edupc* takes the value of 1 if primary school was completed (7 years of education); *edusi* takes the value of 1 if secondary school was not completed (between 8 and 11 years of education); *edusc* takes the value of 1 if the individual completed secondary school (12 years of education); *eduui* takes the value of 1 if higher education was not completed (between 13 and 16 years of education); *eduuc* takes the value of 1 if the individual completed higher education (17 years or more).

Returns to education, therefore, are derived as follows:

$$r_{edupc} = \frac{\beta_1}{S_{edupc}}$$

$$r_{edusi} = \frac{(\beta_2 - \beta_1)}{(S_{edusi} - S_{edupc})}$$

$$r_{edusc} = \frac{(\beta_3 - \beta_1)}{(S_{edusc} - S_{edupc})}$$

$$r_{eduui} = \frac{(\beta_4 - \beta_3)}{(S_{eduui} - S_{edusc})}$$

$$r_{eduuc} = \frac{(\beta_5 - \beta_2)}{(S_{eduuc} - S_{edusc})}$$

where S_{edupc}, S_{edusi}, S_{edusc}, S_{eduui}, and S_{eduuc} are the total years of schooling for each level of education.

It should be noted that this model makes two important assumptions: (1) the wage differential between workers with different levels of education is constant over the entire period; and (2) the only cost of continuing to study is the foregone wages during that period. The models will be estimated using OLS.

4.2 The Data

For the empirical work, the Permanent Household Survey data from the first quarter of 2022 was used. Specifically, to calculate the returns to education, we will focus on the variables: NIVEL_ED (highest educational level achieved), P21 (income from the main occupation), PP3E_TOT (weekly working hours), and CH06 (age). Additionally, the data was filtered for labor income greater than zero and age between 18 and 65 years.

To estimate the returns, it was necessary to construct some variables: LnW_i is the natural logarithm of the monthly salary (P21) over the number of hours worked in the month. Experience is constructed from the difference between age, years of schooling, and six (the age at which formal education starts). As indicated by the Mincer Equation, returns to squared experience will also be considered. Returns to each educational level will be worked as indicated in the previous section.

5 Results

In this section, the results of the Mincer regressions will be presented. Model 1 of Table 4 shows the results of Regression (1) and Model 2 the results of Regression (2) which differentiates by educational level.

The first relevant conclusion is that **each additional year of education leads to an average salary increase of 8%**. This number should be compared with the results of Table 1. Thus, taking the returns to education from 2014 for the Latin American region of 9.3% (Montenegro and Patrinos, 2014), Argentina would be below its neighboring countries by more than one point.

If we consider the literature on returns to education in Argentina specifically mentioned in the second section, the returns to education at the beginning of the century were 11% (Fiszbein, Giovagnoli, and Patrinos, 2007). The decline in returns to education over the last decade has been pronounced. In contrast, Argentina's educational attainment is one of the highest in the region (Barro and Lee, 2022), and access from kindergarten to university is public.

Moreover, **each additional year of labor market experience increases salary by 3%**. This number coincides with that of the literature addressing the returns to education in Argentina (Fiszbein, Giovagnoli, and Patrinos, 2007). In turn, this indicates that one would expect squared experience to be a small and negative number, which is also found in the estimated model.

Variable	Model 1	Model 2
Intercept	4.394***	4.891***
	(0.027)	(0.034)
Years of Schooling (yearse)	0.079***	
	(0.002)	
Work Experience (Exper)	0.029***	0.030***
	(0.002)	(0.002)
Squared Experience (Exper^2)	-0.000***	-0.000***
	(0.000)	(0.000)
Primary Education (edup)	0.120***	
	(0.032)	
Secondary Incomplete (edusi)	0.218***	
	(0.032)	
Secondary Complete (edus)	0.403***	
	(0.031)	
Tertiary Incomplete (eduuI)	0.573***	
	(0.033)	
Tertiary Complete (eduu)	0.928***	
	(0.032)	
Observations	15,258	15,258
R-squared	0.159	0.169

Table 3: Regression Results for Returns to Education

To complement this analysis, Equation 1 can be estimated annually from 2004 to 2022, capturing the 'yearse' coefficient, which represents the average return rate for an additional year of education. In this way, Figure 8 is obtained. The sharp decline in the return rate is evident, with peaks of 11% in 2005 and 7.5% in 2013.

Figure 8: Rates of returns to education for Argentina over time

In contrast, using Barro & Lee's *educational attainment* database (1960-2020), the trend in average years of schooling has been increasing over practically the entire period analyzed.

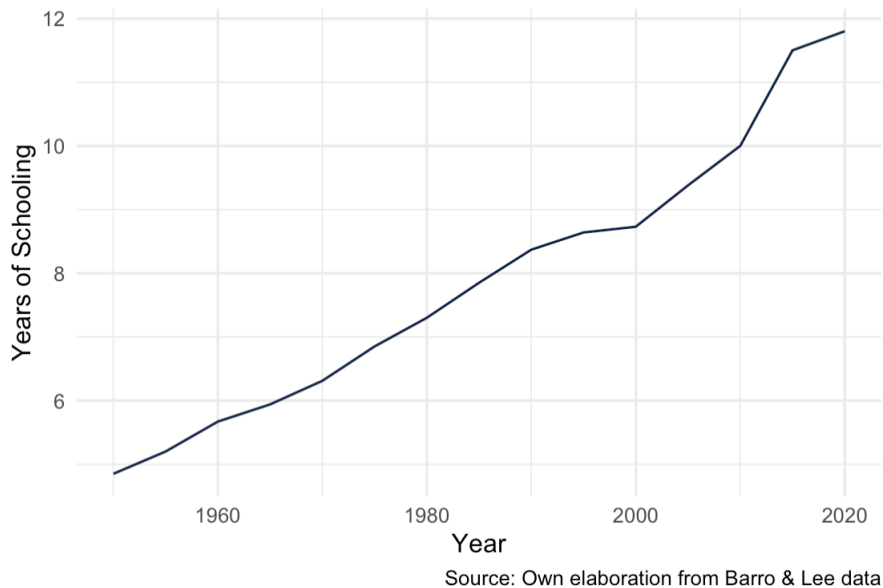Source: Own elaboration from Barro & Lee data

Figure 9: Average years of schooling for Argentina over time

This turns out to be a counter-intuitive observation: **the increasing trend in years of schooling opposes the decreasing trend of returns to education**. On one hand, it can be explained by more years of schooling making the marginal return for an additional year of education lower. It can also be due to a decline in educational quality where more students advance per year and the general level is deficient. Another possible explanation is

the so-called 'brain drain' where those who have invested the most years in education leave the country or work remotely for a foreign company. All these will be studied in depth in the next section.

6   Conclusion

After calculating the returns to education following Mincer's Equation for Argentina in the first quarter of 2022 and annually for the period 2004-2021, we can conclude that investment in human capital significantly increases individuals' labor income. The estimation showed a return rate of 8% for 2022 and a return to experience of 3% per year. Introducing the analysis of average years of schooling and comparing it with the series of returns reveals a paradoxical observation: while the returns to education are decreasing, the years of schooling are increasing.

On one hand, this could be related to the historical context. The educational reform of the 1990s [5] represented a shift in the orientation of public education policies and aimed at institutional improvement of the system. However, it ended up making grade progression more accessible and creating conditions for a gradual decline in the overall educational system (Tedesco and Fanfani, 2001). Therefore, a plausible explanation is that, as the average number of years of education increases, the marginal return to an additional year of education diminishes. Additionally, if the education is of relatively lower quality, the signal is also weaker, and it would be necessary to attain a higher level to convey the same signal of productivity.

On the other hand, as mentioned in section 3, nominal wages in Argentina are very low (the average labor income is around $300), which creates strong incentives for what is known as the 'brain drain.' This term refers to the loss of human capital from one area to another or from one industry to another. It usually occurs when qualified individuals and professionals leave their home country for another where they can take advantage of better opportunities.

This loss of skilled workers can happen in various ways, primarily through emigration. According to statistics from the National Immigration Directorate, the main emigration destinations for Argentines tend to be Spain, Italy, and the United States. Furthermore, with the rise of remote work in recent years, working for another country while living in Argentina has become a much sought-after alternative. Although household surveys may not capture the migration of the most educated individuals, it could be an explanatory factor for the decline in returns.

A particularly relevant point, which exceeds the scope of this work but is relevant for

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[5]Law No. 24.195 (Federal Education Law, 1993) and Law No. 24.521 (Higher Education Law, 1995).

future analysis, is whether this reduction in the rate of returns to education is a cause or consequence of the loss of human capital. It raises the question of whether the most skilled individuals leave the country because they see higher returns on their investment abroad, or whether, as they leave, the returns to education within the country diminish. It would also be interesting to access a database disaggregated by educational level to understand to what extent the more educated individuals tend to be the ones who emigrate the most.

Ultimately, regardless of the cause of the decline in returns to education, the situation is critical. With an impending shortage of skilled labor, an educational solution is necessary, although rarely considered by the current governments, and it must be accompanied by appropriate macroeconomic policies that reduce the incentives for the most educated individuals to leave the country.

7 Appendix

7.1 Appendix 1: The Argentine Labor Market

Before analyzing the income distribution in detail, it is relevant to explain the general Argentine labor market. Appendix 1 develops a more thorough analysis of the main labor indicators in Argentina, but the main conclusions are presented below in Figure **??**.

Rates	% or Number
Activity Rate[1]	47%
Employment Rate[2]	43%
Unemployment Rate[3]	7%
Status	
Employed	12,583,977
Unemployed	942,704
Inactive	11,269,210
Population	
Total	29,073,215
Economically Active Population	13,526,681

Table 4: Principal Indicators

- **Activity status:** relationship of individuals with the production of goods and services of economic value in the market.

  - **Employed**: those who are working during the reference week or are not working but maintain a job.

  - **Unemployed**: those who do not have a job, are available to work, and actively sought work at some point in the last 30 days.

  - **Inactive**: those who are neither working nor actively sought work in the reference period - last 30 days.

- **Activity rate:** calculated as a percentage between the economically active population and the total reference population.

- **Employment rate:** calculated as a percentage between the employed population and the total reference population.

- **Unemployment rate:** calculated as a percentage between the unemployed population and the economically active population.

- **Rate of employed job seekers:** calculated as a percentage between the employed population seeking jobs and the economically active population.

7.2 Appendix 2: Informality in the Argentine Labor Market

The Permanent Household Survey is primarily aimed at being an indicator of the informality rate. Although respondents do not explicitly declare that they are formal, some questions refer to whether they have pension deductions (PP07H), paid vacations (PP07G1), bonuses (PP07G2), paid sick days (PP07G3), and health insurance (PP07G4). These are conditions that make a worker formal according to Law 20.744, and the variables in parentheses refer to the responses to these questions in the microdata.

Developed countries have less than 20% informality rate, but in Argentina, it is around 40%. One clear conclusion that can be drawn from this work is that higher education leads to lower levels of informality.

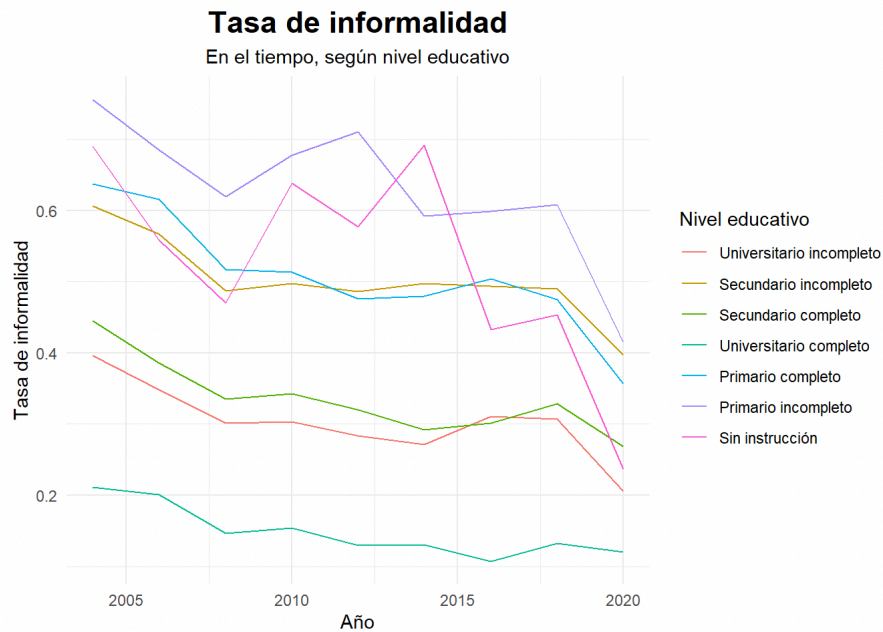Based on data from the first quarter of each year, this can be demonstrated:

Figure 10: Informality Rate by Educational Level

8 Referencias

- Adrogué, C. (2006). Desempleo y retornos a la educación superior en la Argentina (1974-2002). *Universidad Católica de Salta, Salta: XLI Reunión Anual de la Asociación Argentina de Economía Política.*

- Arrow, K. J. (1973). <u>Information and economic behavior</u>. Harvard University Press.

- Barro, R. J., & Lee, J. W. (1996). International measures of schooling years and schooling quality. *The American Economic Review*, 86(2), 218-223.

- Becker, G. S. (1964). <u>Human capital theory</u>. Columbia, New York,1964.

- Borjas, G. J., & Van Ours, J. C. (2020).<u>Labor economics</u>. Boston: McGraw-Hill/Irwin.

- Card, D. (1994). *Earnings, schooling, and ability revisited.* NBER Working Papers Series, Nř 4832.

- Coremberg, A. (2010). The Economic Value of Human Capital and Education in an Unstable Economy: Argentina. *In 31st General Conference of The International Association for Research in Income and Wealth.*

- Fiszbein, A., Giovagnoli, P. I., & Patrinos, H. A. (2007). Estimating the returns to education in Argentina using quantile regression analysis: 1992-2002.*Económica*, 53.

- Griliches, Z. (1977). Estimating the returns to schooling: Some econometric problems. *Econometrica: Journal of the Econometric Society*, 1-22.

- Mincer, J. (1974). Schooling, Experience, and Earnings. Human Behavior & Social Institutions No. 2. NBER, New York.

- Montenegro, C. E., & Patrinos, H. A. (2014). Comparable estimates of returns to schooling around the world. World Bank policy research working paper, (7020).

- Paz, J. A. (2009). Retornos a la educación en Argentina. Estructura regional.*Documentos de trabajo del IELDE*, 1-39.

- Psacharopoulos, G., & Patrinos, H. A. (2018). Returns to investment in education: a decennial review of the global literature.*Education Economics*, 26(5), 445-458.

- Schultz, T.W. (1961). Investment in Human Capital, *American Economic Review LI: 1-17.*

- Spence, M. (1973) Job Market Signaling *The Quarterly Journal of Economics*, 87 (3): 355-374.

- Tedesco, J. C., & Tenti Fanfani, E. (2001). La reforma educativa en la Argentina. Semejanzas y particularidades. *Buenos Aires: Ministerios de Educación de Argentina, Chile y Uruguay, Grupo Asesor de la Universidad de Stanford/BID.*

- Todaro, M. P., & Smith, S. C. (2020). Economic development. Pearson UK.