Economic Crisis and the Collapse of Venezuelan Human Capital

Omar Zambrano

January 2025

Introduction

The notion that the generation and accumulation of human capital is an indispensable process for economic growth is one of the most widely held views in economic literature. It is understood that a country's stock of human capital enables the expansion of the production factor base and boosts productivity, which translates into greater economic growth and wealth. Furthermore, the accumulation of human capital is the engine of innovation, facilitates adaptation to new technologies, reduces inequality, and improves people's living conditions.[1]

Between 2013 and the end of 2021, Venezuela experienced one of the worst economic growth collapses recorded in contemporary economic history. During this period, the country lost over

1 Robert J. Barro, "Determinants of Economic Growth: A Cross-Country Empirical Study", Technical Report w5698, *National Bureau of Economic Research,* Cambridge, 1996, https://www.nber.org/system/files/working_papers/w5698/w5698.pdf

75% of its Gross Domestic Product, representing one of the deepest episodes of economic contraction known in peacetime.[2] The consequences of this episode, in terms of the evolution of traditional human welfare indicators, have been profound and persistent. In fact, the partial recovery in economic activity levels that has occurred from 2021 to the present has been so slight in magnitude, so limited in terms of sectors, so geographically circumscribed, and so economically unequal, that it has proven insufficient to improve the living conditions of large segments of the Venezuelan population, which continues to face extreme precarity in their material living conditions.

This article summarizes the main findings of the research titled "Economic Collapse and the Stock of Human Capital: Impact of Venezuela's Economic Crisis on the Quantity and Educational Level of the Labor Force,"[3] which will soon be published by the Inter-American Development Bank. This work quantifies for the first time the effect that the collapse experienced by the Venezuelan economy had on the country's human capital accumulation process.

It is known that in recent years, the quantity and availability of human capital in Venezuela have experienced a significant contraction as a consequence of the concurrent effects of two

---

2 For example, according to the Total Economy Database, during the Great Depression starting in 1929, the U.S. lost approximately 30% of its GDP; likewise, during the post-Soviet transition between 1991 and 1999, Russia lost around 40% of its GDP; and, during the hyperinflation crisis from 2000 to 2008, Zimbabwe experienced an estimated 50% loss of its GDP.

3 Omar Zambrano, Hugo Hernández, Albani Granado, Gabriel Quiroz, y Jean Pierre Oliveros. *Colapso económico y acervo de capital humano: impacto de la crisis económica de Venezuela sobre la cantidad y nivel educativo de la fuerza laboral.* Banco Interamericano de Desarrollo. 2024.

factors: (i) a demographic adjustment resulting from a massive migratory wave, which has led to the departure of nearly one-fifth of the population;[4] and (ii) the deep decline in the real value of wages, which has reduced incentives to participate in the labor market and to invest in higher education among younger generations, with a disproportionately greater impact on Venezuelan women.[5] Although theoretically it is understood that both factors must have affected the quantity and availability of human capital in Venezuela, little is known about the quantifiable magnitude and depth of these effects.[6]

---

4 R4V, Plataforma de Coordinación Interagencial para Refugiados y Migrantes de Venezuela. "Refugiados y migrantes de Venezuela", 2024, https://www.r4v.info/es/document/r4v-america-latina-y-el-caribe-refugiados-y-migrantes-venezolanos-en-la-region-noviembre-3

5 According to the results of the 2023 Time Use Survey, only 41.5% of working-age women participated in the labor market —one of the lowest activity rates in the region, Zarah Dominguez, Albani Granado, Ana Ibarra, Anaís López, Claudia Piras, Omar Zambrano, *Trabajo no remunerado y desigualdades de género en Venezuela,* Banco Interamericano de Desarrollo, 2024, https://doi.org/10.18235/0013230
Likewise, it is estimated that one-third (32.9%) of Venezuelan youth between the ages of 15 and 24 —equivalent to 1.8 million individuals— are neither studying nor working. In other words, they are entirely outside any process of human capital accumulation or improvement, ANOVA Policy Research, *Oportunidades perdidas: Tendencias en la movilidad intergeneracional en educación en Venezuela,* 2024, https://thinkanova.org/2024/12/18/oportunidades-perdidas-tendencias-en-la-movilidad-intergeneracional-en-educacion-en-venezuela/.

6 Following the findings in Zambrano et al. (2024), *Colapso económico y acervo de capital humano...* this article outlines the assessment of the evolution of Venezuela's labor supply in recent years, using evidence drawn from the microdata of available household surveys (EHM-INE and ENCOVI), Sartorio (Luca Sartorio, *An Employment Diagnostic Approach to Address Labor Market Stagnation in Argentina,* Harvard University, *2022,* https://www.consorcio.edu.pe/umbral/wp-content/uploads/2023/07/An-Employment-Diagnostic-Approach-to-Address-

The Crisis and the Period of Human Capital Collapse in Venezuela (2015–2021)

As mentioned, during the economic crisis from 2013 to 2021, the change in both the quantity and composition of Venezuela's labor supply was determined by the combined effect of two mechanisms: (1) demographic adjustment due to migration; and (2) the sharp decline in real wages and its impact on the labor market. The evidence analyzed in Zambrano[7] quantifies the impact of both effects on the number of available workers as well as on the composition of the workforce by educational level (completed primary education or less, completed secondary education, and completed higher education).

Below is the sequence of the **eight key impacts** observed in the labor market between 2015 and 2021, the period referred to as the collapse of Venezuelan human capital:

Labor-Market-Stagnation-in-Argentina.pdf) y Patrinos (Harry Patrinos, *Estimating the return to schooling using the Mincer equation*. IZA World of Labor, 2016, https://wol.iza.org/uploads/articles/278/pdfs/estimating-return-to-schooling-using-mincer-equation.pdf). It then presents an estimate of the economic growth costs associated with the loss of human capital, following the framework of Barro ((*Notes on Growth Accounting,* National Bureau of Economic Research Working, Paper Series N° 6654, Julio 1998, https://www.nber.org/papers/w6654.pdf), and finally proposes a counterfactual international comparison framework based on the methodology of Abadie and Gardeazabal: Alberto Abadie, Javier Gardeazabal, "The Economic Costs of Conflict: A Case Study of the Basque Country", *The American Economic Review,* American Economic Association, 2003, 93(1):113–132.

7 Omar Zambrano, Hugo Hernández, Albani Granado, Gabriel Quiroz, y Jean Pierre Oliveros, *Colapso económico y acervo de capital humano: impacto de la crisis económica de Venezuela sobre la cantidad y nivel educativo de la fuerza laboral.* Banco Interamericano de Desarrollo, 2024, (to publish).

1. The economic crisis eroded the incentives to participate in the labor market and to invest in education

The collapse in Venezuela's Economically Active Population (EAP),[8] was driven by the sharp decline in real wages, mainly triggered by the hyperinflationary crisis of 2017, which severely distorted the incentives to engage in formal economic activity. In fact, between 2012 and 2021, total labor income plummeted by an estimated 86.1% in real terms. This collapse also reshaped how people perceived the value of education, affecting individual decisions around human capital training. Between 2010 and 2021, marginal returns to education fell steadily.[9] In fact, in 2010 an additional year of schooling was associated with a 3.7% increase in real income, by 2021 that figure had dropped to 1.7% —a 54% decline in the return on educational human capital investment.

2. Venezuela lost 4.1 million people of working age

As a result of the sharp deterioration in labor income during the study period, particularly beginning in 2014, millions of Venezuelans crossed the borders in what constitutes one of the

8 The Economically Active Population (EAP) is defined as the group of individuals within a population who are of the minimum legal working age and who, during a specific reference period, are either employed (engaged in paid or productive activities) or unemployed (actively seeking work).

9 Marginal returns to education refer to the additional increase in labor income obtained from investing in one more year of education or a higher educational level. They are calculated using the so-called "Mincer equations," which establish a functional relationship between years of education, work experience, and income, and can be empirically estimated.

largest contemporary migration crises.[10] As a consequence of this massive migratory wave, Venezuela's population dropped abruptly to 28,352,075 people in 2021, a figure even lower than the one officially recorded in the last population and housing census of 2010.[11]

The drop in Venezuela's population was mirrored by the collapse of the working-age population,[12] the most economically and productively significant demographic group. In fact, between 2017 and 2021, the working-age population contracted by 19.8% —an absolute decline equivalent to 4.1 million working-age individuals. This drop was concentrated in the younger cohort aged 15 to 24 (-19.7%) and the most economically productive group aged 25 to 50 (-10.4%).

3. *Venezuela lost a third of its labor force participation*

Parallel to the absolute decline in the number of people of working age, the economic collapse of the latter half of the past decade —marked by the closure of thousands of businesses and framed by a hyperinflationary crisis— triggered a simultaneous contraction in labor demand and an abrupt drop in average real wages. This collapse in real wages led, among other effects, to a sharp disincentive for labor market participation. Between 2015

10 The UN Refugee Agency (UNHCR) estimates that over 7.8 million Venezuelans have emigrated over the past decade.

11 The 2010 population figure is based on the estimate provided by the National Institute of Statistics (INE). The subsequent figures correspond to estimates from the United Nations Department of Economic and Social Affairs.

12 The working-age population comprises those between 15 and 64 years of age.

and 2021, the labor force participation rate fell by 11.6 percentage points —equivalent to a drop of 4.4 million people, or one-third of the economically active population (EAP). This contraction disproportionately affected women and workers with greater labor market experience.

4. A significant portion of the most highly skilled workers exited the labor market

The aforementioned drop in real wages and the subsequent decline in the economic returns to education led to a reduction in the availability of highly skilled workers beginning in 2015. It is estimated that between 2015 and 2021, the number of active workers with higher education declined by 27.4%, while the total number of active workers with a completed secondary education fell by 29.0%. In aggregate terms, by 2021, the number of active workers with completed secondary, technical, or university education had declined by 2 million compared to 2015. These shifts in the educational profile of the Venezuelan labor force had a disproportionately greater impact on women.

5. Venezuela lost a significant share of its accumulated educational gains

The estimated loss in the economically active population, combined with the heavy concentration in relatively more skilled and productive segments, amplified the aggregate effects on the country's accumulated educational stock. In fact, when measured using the "educational mass" variable,[13] it is estimated that the total years of education embodied in the economically

13 It is defined as the aggregate sum of years of education of the entire economically active population. It is obtained by adding the number of

active population declined by 39.8% between 2015 and 2021. This represents a loss or removal of 55.3 million years of education from the productive effort. On average, it is estimated that the number of years of schooling among active Venezuelan workers fell from 11.1 years in 2015 to 9.5 years in 2021 —a decline of 1.1 years in average educational attainment.

6. *Venezuela squandered a significant portion of its most experienced workers*

Work experience represents a crucial learning environment where most job-specific knowledge and skills are acquired. Using the Mincer (1974) approach —which accounts for an individual's age, years of basic and secondary education, and the age at which they enter the education system—[14] it is estimated that during the collapse period of Venezuela's human capital stock (2015–2021), the total number of potential work experience years accumulated within the economically active population fell by 34%, equivalent to 97.8 million years.

7. *Human capital losses contributed to the collapse in economic growth*

The substantial erosion in both the availability and the skill level of Venezuela's labor force —through the mechanisms previously described— had a direct impact on the country's

workers incorporated into the EAP by the estimated number of years of education of each worker.

14 In the case of Venezuela, the resulting variable is calculated as follows: Age in years −primary education (6 years) −secondary education (5 years) −age at which formal education begins (5 years).

productive capacity. Based on a growth accounting exercise,[15] it is estimated that between 2013 and 2021, but especially from 2015 onward, the country experienced a sharp collapse in both forms of capital: physical and human. Between 2015 and 2021, the decline in human capital alone accounted for 12% of the total GDP contraction during this period —equivalent to a negative annual impact of 2.7 percentage points on economic growth.

8. Human capital losses between 2015 and 2021 are even greater when viewed from an international comparative perspective

A counterfactual estimation framework using the Synthetic Control Method (SCM) proposed by Abadie and Gardeazabal finds that, by 2021, Venezuela's economically active population (EAP) was 6.0 million people smaller than it would have been based on the projected trajectory under a counterfactual scenario. This divergence —indicating that the EAP was 36% smaller than it would have been in a "no human capital collapse" scenario— can be interpreted as an approximation of the cumulative impact that Venezuela's socioeconomic and migratory crisis has had on the country's human capital stock.

15 In Zambrano et al., *Colapso económico y acervo de capital humano...*, the growth accounting exercise is formulated in the Barro (Robert Barro, *Notes on Growth Accounting...*) style, disaggregating the human capital stock by educational level as in Jorgenson y Griliches: Dale Jorgenson, Zvi Griliches, "The Explanation of Productivity Change", *The Review of Economic Studies*, 1967, Oxford University Press, 34(3):249–283, as well as Dale Jorgenson, Frank Gollop, Barbara Fraumeni, *Productivity and U.S. Economic Growth*, University of Southern Maine, 1987, https://digitalcommons.usm.maine.edu/facbooks/114/

Conclusions and Policy Implications

Between 2013 and 2021, Venezuela lost more than 75% of its Gross Domestic Product in one of the deepest and most prolonged economic depressions in modern economic history. Although economic activity began to contract in 2013, it was from 2015 onward that the country experienced the most acute effects of the economic collapse, with concurrent impacts stemming from the destruction of the productive base, the hyperinflation crisis, and the breakdown of basic public and social services.

The collapse in the value of real wages starting in 2015 not only triggered a deep crisis in Venezuelans' living conditions, but also completely distorted the incentives for schooling and labor market participation. Both mechanisms profoundly affected the process of human capital accumulation in Venezuela in recent years, but until now, the magnitude of the specific impacts on the labor market had not been quantified.

The evidence indicates that the 2015–2021 period —referred to here as the collapse of human capital— was marked by a severe contraction in both the quantity and composition of Venezuela's labor force. During this period, Venezuela experienced a one-third decline in its economically active population, equivalent to approximately 4.4 million people. It is estimated that, during the human capital collapse, Venezuela's labor force lost 27.4% of its university-educated professionals, 39.8% of its total accumulated years of schooling, 34.0% of its total accumulated years of work experience, and 1.1 years of average schooling.

The productive and educational decline described in this article has deep and lasting implications for Venezuela's prospects of economic recovery. Given that the collapse of human capital disproportionately affected specific subgroups —such as women, workers in their prime productive years (ages 25 to 50), and those with higher levels of education and work experience— any diagnosis or policy design aimed at future growth must include targeted measures for these populations. Otherwise, the constraint posed by human capital will remain a binding limitation on any sustained economic growth process.

A reform agenda for sustained and democratic growth must necessarily include the reconstruction of Venezuelans' productive capacities —particularly the rebuilding of the country's stock of human capital. The starting point should be a process of economic stabilization that enables a sustained increase in the real value of wages, as the only viable path to reversing the perverse incentives that currently discourage both labor market participation and the accumulation of formal education. Likewise, any agenda for recovery and sustained growth must incorporate targeted policies to support female labor force participation, including the reconstruction of elements of the social safety net that support caregiving and unpaid domestic work. In addition, specific policies must be designed to create incentives for the return of the Venezuelan diaspora —especially those migrants of prime working age, with greater labor market experience, and higher levels of education. Finally, immigration policies that encourage openness and attract non-national talent should be formulated as an alternative pathway to reconstitute the country's depleted stock of human capital.