Economic Crises and Returns to University Education in Middle-Income Countries

Stylized Facts and COVID-19 Projections

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Abstract

This paper documents stylized facts on rates of returns to education during economic crises. It shows from three middle-income countries—Indonesia, Pakistan, and South Africa—that the rate of return to university education (versus secondary education) has increased during

economic crises. Based on this stylized fact, the paper projects that the returns for university graduates may increase by at least one-quarter to one-third during the COVID-19 pandemic.

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Economic Crises and Returns to University Education in Middle-Income Countries: Stylized Facts and COVID-19 Projections¹

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1. Introduction

The COVID-19 pandemic has led to an ongoing economic crisis that is leading to loss of jobs, lower incomes, and increased poverty. Preliminary evidence suggests that the impact of the crisis is not only immediate, with low-income workers suffering more than high-income workers (Reeves and Rothwell 2020), but also learning loss for the current cohort of students will cause a long-run negative impact on their earnings that will be felt over the life time of individuals. Some recent estimates project the future earnings gap at the individual level to be over \$11,000 globally (Psacharopoulos et al. 2020). As predicted by human capital theory, educated workers are better able to cope with the disequilibria brought on by events such as economic crisis because they are able to adapt to the changing needs of employers and new technologies (Schultz 1975).

Like other economic assets, returns to education are also subject to cyclical variations (see Kniesnar et al. 1978, 1980; King 1980). In the United States, cross-sectional rates of return are strongly related (positively) to the unemployment rate (King 1980). Economic and financial crises have positive effects on the rate of return to schooling. The returns to schooling are expected to increase in recessions and decrease in expansions (Chen and Kelly 2020).

Several studies have documented the changes in the rates of return before, during and after a crisis. In Argentina, during the volatile periods of 1992-2002, the earnings of educated workers were less affected by crises than the earnings of the less educated workers (Fiszbein, Giovagnoli and Patrinos 2007). Educated workers in Mexico enjoyed larger advantages than less educated ones during non-crisis years, and even larger advantages during crises and recessions (Psacharopoulos et al. 1996). During the recent economic crisis, university educated graduates enjoyed better prospects in the labor market than those with lower educational levels in Greece (Cholezas et al. 2013). Returns to schooling increase during crisis years in the República Bolivariana de Venezuela (Patrinos and Sakellariou 2006). In summary, the fact that more educated workers fared better during the economic crises in Argentina, Mexico, Greece, and Thailand confirms that the returns for more educated workers rose during the crises, and suggests that the Schultz thesis holds about educated workers being more able to adapt to crisis-induced disequilibria.

In this paper, we examine the rates of return to university education (versus secondary education) before and after economic crises in Indonesia, Pakistan, and South Africa. We present a conceptual framework that explains the reasons behind a widening of the gaps. Next, we present stylized facts from the three countries that support the conceptual framework, including a random effects GLS regression analysis. Based on our analyses, we project that the returns to university education are likely to rise by at least one-quarter to one-third in the three middle-income countries during the COVID-19 pandemic. The increase in returns implies a worsening of income inequality during the pandemic. We conclude with policy implications.

2. Conceptual Framework

The rate of return to a level of education is the internal rate of return from completing a level of education. As mentioned earlier, we focus on the private rate of return to university education (versus secondary education), which is computed by comparing the monetary costs (foregone earnings from only secondary education) and benefits (earnings) of university educated workers. In Table 1, we consider three possible scenarios during an economic crisis.

Table 1: Possible Changes in Earnings and Returns to University Education (versus Secondary Education) during an Economic Crisis

<i>Scenario</i>	<i>Changes in earnings of workers with university education</i>	<i>Changes in earnings of workers without university education</i>	<i>Change in rate of return to university education</i>
1	↓	↓↓	↑
2	↓↓	↓	↓
3a	↓	↓	Unchanged
3b	↓↓	↓↓	Unchanged

Source: Authors' conceptualization.

In Scenario 1, and according to human capital theory, educational attainment increases cognitive skills and, hence, improves labor market outcomes such as productivity and earnings. In his seminal paper, “The value of the ability to deal with disequilibria,” Nobel laureate Theodore Schultz (1975) argued that educated (or skilled) workers are better able to cope with the disequilibria brought on by events such as economic crises because they are able to adapt to the changing needs of employers and new technologies. In addition, educated workers are better able to seek information about job opportunities from family, friends, advertisements, former employers, radio and the labor bureau (Oreopoulos, von Wachter and Heisz 2012).

The ability to deal with disequilibria implies that the rates of return to university education rise during a crisis. This is because the earnings of those with less education fall, partly due to increased unemployment among the less educated. This creates a pool of unemployed less-educated workers, which in turn dampens the wages of less-educated workers. If the earnings of the university graduates remain unchanged or decline modestly, then the rate of return to university education increases during a crisis. Also, more educated workers can more easily find other work to maintain earnings. More educated workers can switch to better jobs quickly while less educated workers tend to take lower paying jobs during a crisis and typically do not have that ability to switch to better jobs (Autor, Hanson and Song 2014). Finally, employers may be reluctant to lay off educated workers because they are better able to adapt to changing economic conditions.

In scenario 2, the rate of return to university education falls because university-educated workers experience greater declines in earnings relative to secondary-education workers.

This can happen if the economy is not dynamic. Or when higher education is over-expanded (Gonzalez and Uwaifo Oyelere 2011).

In scenarios 3a and 3b, the rates of return to university education remain unchanged because the crisis has a similar impact on secondary-educated and university-educated workers. The reduction in earnings among both groups of workers is such that the rate of return is the same before and during the crisis.

3. Data and Stylized Facts from Past Crises

We use data on economic growth rates from the World Development Indicators (<http://datatopics.worldbank.org/world-development-indicators/>) and estimates of the returns to university education obtained from the following sources:

- Indonesia: 1990, 1992, 1994, 1996, 1998, 2000, 2002: Psacharopoulos and Patrinos (2018); 1999, 2003, 2004, 2006, 2008, 2009, 2010: Montenegro and Patrinos (2014).
- Pakistan: 1991 and 1995: Psacharopoulos and Patrinos (2018); 1992, 1999, 2004, 2005, 2006, 2007, 2008, 2010: Montenegro and Patrinos (2014); 2012, 2014, and 2018: authors' calculations.²
- South Africa: 1993: Psacharopoulos and Patrinos (2018); 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, and 2011: Montenegro and Patrinos (2014).

Figures 1, 2, and 3 present economic growth rates and the returns to university education in Indonesia, Pakistan, and South Africa, respectively. Despite the different social and political circumstances, we find two patterns across the three countries. First, the returns to university education steadily increased in all three countries. With globalization and economic development, including the expansion of the service sector, automation (reduces the earnings of secondary-educated workers) and technological revolution (increases the earnings of university-educated workers), those with higher education experienced higher earnings growth than those with only secondary education for most of the years.

² <https://datacatalog.worldbank.org/dataset/data-depot-pakistan>.

Figure 1: Economic Growth and Rate of Return to University Education in Indonesia

Source: Computed from Psacharopoulos and Patrinos (2018); Montenegro and Patrinos (2014)

Figure 2: Economic Growth and Rate of Return to University Education in Pakistan

Source: Computed from Psacharopoulos and Patrinos (2018); Montenegro and Patrinos (2014); and authors' calculations.

Figure 3: Economic Growth and Rate of Return to University Education in South Africa

Source: Computed from Psacharopoulos and Patrinos (2018); Montenegro and Patrinos (2014).

The second pattern in all three countries is that returns to university education rise during economic crisis years. In short, we find support for Schultz's thesis during the financial crises of the 1990s and the late 2000s Global Recession. In Indonesia, returns increased from 12.3 percent to 15.6 percent, a 3.3 percentage point increase or 27 percent increase, during the 1998-2002 recession. Pakistan experienced low (but not negative) growth during the 2008-10 recession, and returns increased from 15.3 percent to 16.2 percent, a 0.9 percentage point increase and 6 percent increase. Finally, South African returns increased from 27.2 percent to 35.9, an 8.7 percentage point and 32 percent increase, during the 2007-09 recession.

After the crises, returns to university education narrowed to pre-crisis levels in Indonesia and Pakistan. In South Africa, however, the returns to university education continued to widen.

4. Random Effects GLS Regression Analysis and Projections

We use a random effects GLS regression model to examine the relationship between economic crises and rate of return to university education. The advantage of random effects GLS regression is that it allows generalizations beyond the sample. In our case, we can make predictions after the data period, extending into the current COVID-19 period and beyond for the three countries.

Table 2 presents the random effects GLS regression results where we regress the rate of return to university education on economic growth and economic growth-squared. Consistent with the Schultz's disequilibria thesis, the results show that the rate of return to university education increases during an economic crisis. In other words, the rate of return to university education has a negative and statistically significant relationship with economic growth rates.

Table 2: Random Effects GLS Regression Results

Rate of return to university education	Coefficient	SE
Economic growth	-0.679*	0.269
Economic growth-squared	-0.058*	0.031
Constant	24.790**	6.891
R squared within	0.02	
R-squared between	0.81	
R-squared overall	0.14	
Number of observations	33	

Notes: (1) * $p < 0.1$ and ** $p < 0.05$. (2) Includes cluster-robust standard errors.

The interpretation of the random effects GLS regression coefficients is tricky since they include both the within-entity and between-entity effects. In the case of three-country data, the results represent the average effect of economic growth over returns to education when the returns change across time and between countries by one unit. Thus, we cannot use the coefficients for projections. Nevertheless, the fixed effects GLS results provide statistical evidence confirming the negative relationship between economic crises and the rate of return to university education.

For projections, we use the data from the crisis years of the 1990s and 2000s. Based on the simple analyses of percentage changes in the three countries, we can project that returns to university education will increase by 25 percent to 33 percent in the three countries during COVID-19. As mentioned earlier, the emerging data from the United States and Europe during COVID-19 provide further support for Schultz's thesis: the unemployment rate for those with university degrees rose less than the unemployment rate for those without university degrees (Berube and Bateman 2020; Lund et al. 2020; Fuchs-Schundeln et al. 2020). These patterns are likely to be even stronger in low- and middle-income countries because of the larger differences in technology education provided in universities versus secondary schools. That is, university educated workers in low- and middle-income countries may be far better at adapting to work-from-home technologies or shifting to jobs that require technological skills compared to the secondary education graduates in their countries. Given the severity of the COVID-19 crisis, it is possible that the rates of return to university education will increase by even more than the levels suggested above.

5. Policy Implications and Conclusion

If this increase in returns to university education persists beyond COVID-19, it will have profound implications on income inequality between those with and without a university degree. It will reflect that the incomes of university-educated workers will drop modestly while the incomes of less-educated workers will drop substantially. Research suggests that these widened income gaps persist and have inter-generational consequences on university attainment and income.

There are three possible policy actions. The first is to maintain government expenditure levels on education. The crisis is expected to lead to budget cuts, and education may lose out. This will jeopardize the gains that have been made globally in terms of access to

education and reduce the ability to deal with future disequilibria. We may also need to think about incentives for students to remain in school, such as scholarships, conditional cash transfers, and savings programs that encourage study. A lack of investment in education and training will hurt long-term economic prospects and lead to short-term losses for students, workers and their families.

A second policy action is to provide income support and employment, particularly for secondary school graduates (who experience larger declines in earnings during recessions) and young people (who typically suffer most from graduating during a recession). Direct income support and employment for young people are important mechanisms to adopt now. In the past, public works programs have successfully kept young people working. Employing youth during the coronavirus pandemic is a good investment because it helps mitigate the long-term consequences of COVID-19 for labor productivity.

A third policy action is to invest in digital skills and technology at the secondary schools and universities. The unusual and unprecedented nature of the crisis means that it is not only the more educated but also the ones who are in jobs and occupations more amenable to remote work who fare better. In most cases, it ends up being people with digital skills. Therefore, equipping people with digital skills can help them cope with future disequilibria. Current labor market participants should also be provided opportunities to learn and use digital skills.

All three actions are needed. All three also encourage continued investment in education so that education levels will rise.

Going forward, we need more research in real time on the actual impacts of the crisis on employment and earnings by level of education as well as across occupational status. The current pandemic has caused an economic shock which has brought about sudden change in the demand and supply in the labor market (Kramer and Kramer 2020). Different occupational groups are differentially impacted, which will in the medium term change the relative returns to occupations. Having a handle on what this means for education policy and equity should be an important consideration for governments globally.

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