

Higher Education Externalities in Egyptian Labor Markets

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Education is a form of investment, and like all investments, it too can be judged in terms of its returns. This paper estimates the economic external returns (externalities) of higher education to individuals in Egypt—externalities that occur in production and affect wages. Based on data from the Labor Force Sample Survey conducted in Egypt by CAPMAS in 2010, the results suggest that this return is negative and exists only for female workers, while for males the return is negative as well, but statistically insignificant. A unit increase in governorate average higher education is associated with a 68% decrease in females' hourly wage. This could be explained by the fact that education degrees are simply used as a device to signal higher ability, but without raising productivity. Another reason could be the excess numbers of higher education graduates in the Egyptian labor market.

Endogenous growth theories, which emerged in the mid-1980s, highlight the idea that education plays a significant role in the creation and improvement of human capital and, consequently, in economic development. Thus, these theories introduced education externalities as an engine for economic growth. They argue that individuals benefit from education in the form of increased labor productivity and higher wages or earnings. Besides these economic benefits, there are other, noneconomic ones, such as the impact of education on personal health and capacity to enjoy leisure. Furthermore, education yields benefits for society as a whole in what is known as human capital spillover. This is evident in, for example, the diffusion of knowledge through interaction between schooled and less-schooled workers or the importance of research in promoting technological innovation and productivity. Increasing the general level of education in the workforce can also make it profitable to invest in new technologies and in more economically rewarding, though more knowledge-intensive, production processes.

The existence of these externalities is considered one of the main arguments for government subsidization of education, as is the case in Egypt. The Egyptian government is the main provider and funder of education at all levels. In 2010–2011, public expenditure on education amounted to more than 41 billion Egyptian pounds, of which 21.8% were allocated to higher education. This commitment, however, entails two serious challenges for Egypt. First, evidence suggests that private returns from investment in education are relatively low. And second, the government budget is increasingly under pressure to meet the growing demand for higher education due to the large segment of young people in the country (32% of the population in 2011), to technological innovations, and to a more competitive labor market.

Given this context, this paper tests the hypothesis that the returns of higher education are entirely reflected in the earnings of college-educated workers (private returns of education) against the alternative theory that other individuals in the same labor market benefit from spillovers associated with higher overall levels of education (external return of education). The paper focuses on local labor markets and identifies external returns by comparing the wages of otherwise similar individuals living in governorates with different shares of college-educated workers in the labor force.

Results show that each individual year of schooling increases hourly wages by 4.32%, wages of males are 19% higher than women's, and married workers enjoy a 5.2% premium. Local human capital enters the earning equation with a negative and statistically insignificant

coefficient for males. This variable is found to be negative and significant for females—a one-unit increase in local human capital decreases female hourly wages by 46.7%.

These results were tested through a number of robustness checks using individual and governorate-level variables. One such variable controlled the type of work—public or private. Results showed that working for a public enterprise decreases wages by 4.9%. However, this variable had very little impact on the estimated effects of individual human capital and experience. More importantly, even though the estimates of external returns turn out to be slightly higher for males, they remain negative and highly insignificant; while for women, they are a little lower and still negative, but significant. The same results were achieved after introducing another variable pinning down the sectors of economic activity of the firm for which each individual works. This variable had no effect on the local human capital coefficient, but interindustry wage differentials turned out to be relevant.

Additional variables included controlling for the distribution of unemployment across governorates. If better educated individuals are less likely to be unemployed, then average human capital might pick up the effect of the unemployment rate. Results show that local unemployment rate enters with a negative sign, but is statistically insignificant. Local human capital effect is indifferent from the basic model, although significance level is lower for females. Next, the quality of education in each governorate is considered through three variables: student-teacher ratio, classroom density, and dropout ratio—all at the preparatory school level. The first is insignificant, the second has a weak negative effect and significance at 90%, and the third has a strong negative and significant effect. Crucially, the coefficient of local human capital turned out to be significant and negative for the three models. A unit increase in governorate average higher education is associated with a 44% decrease in wages for the whole sample.

Local human capital can also be correlated with omitted variables related to the availability of amenities that determine the quality of life of local communities. Two variables were introduced: ratio of designed sewage capacity to population in each governorate in 2010 and ratio of the number of health units with beds to population in each governorate in 2010. Results showed that these variables had an insignificant effect on individual wages. However, the local human capital turned out to be significant and negative. A unit increase in governorate average higher education is associated with a 106% decrease in wages, i.e. again, we have negative externalities to higher education.

The instrumental variables (IV) approach was also applied for the groups of men and women separately. Three instruments were used: the percent of general secondary to total secondary students in each governorate in 2002; the rate of change in ratio of university and above-university graduates who entered the labor market in the 1980s, 1990s, and 2000s by governorate; and the lagged regional demographic structure—percent of population under 5 years of age and between 5 and 10 years in each governorate in 1996. The results show that for males, using any of the three IVs, there is no significant relationship between local human capital and wages. For women, however, a negative significant relationship was found when using the first and third IVs. A unit increase in governorate average higher education is associated with a 67% and 139% decrease in females' wages, respectively, i.e. negative externalities to females' higher education.

Given the negative higher education externalities demonstrated in this study, and taking into account other studies that confirm that private rate of return to higher education in Egypt is higher than that to lower education stages, this paper suggests that government subsidization of higher education in Egypt should be questioned. It argues that more attention should be given to

various methods of cost sharing, including the use of fees and tuition, student loans, financial contributions from employers to vocational education and training. A shift from public to private financing may be resisted on the principle of equity. However, cost sharing may actually make distribution of financial resources more equal. Private financing can free up public funds, which can then be used to increase subsidies, provision, and quality of education for poor and disadvantaged groups, and to expand primary schooling. This will make the system both more equitable and efficient. Further empirical analysis of the equity implications of alternative policies for investment in education is needed.