Economic and Social Commission for Western Asia

The cost of child marriage over the life cycle: Evidence from Egypt, Jordan, Iraq and Tunisia
Pricing and Aggregation - Economic costs

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Section 1

Costing Child Marriage

Chaban and Cunningham (2011) Measuring the Economic Gain of Investing in Girls

- Adolescence is the critical period when girls are at a greater risk of many events with irreversible negative consequences – such as child marriage, early pregnancy, or school leaving – that not only impact girls themselves but also the next generation.
- This is the first systematic research to measure the opportunity cost of teenage motherhood to economic growth.

Chaban and Cunningham (2011)

- They estimate the effects of early school dropout, teenage pregnancy, and joblessness, defined as the ratio of the number of girls between the age of 15 and 24 who are not in school or in the labor force as a share of the female working age population aged 15-24.

Chaban and Cunningham (2011)

- They only estimate the opportunity (economic) cost and do not consider financial costs.
- The opportunity cost is a measure of —what could have been‖ if only the additional investment had been made in girls.

Chaban and Cunningham (2011)

Methodology for computing the cost of leaving school early

- Measuring the loss in potential earnings due to lower educational attainment is done in two steps.
- First, they generate an age earnings profile by gender and education level.
- To calculate the wage for each cell, they adjust the mean national wage for a given country using coefficient estimates from latest national Mincer regressions to evaluate the variation of wages according to education, age and gender.

Chaban and Cunningham (2011)

Methodology for computing the cost of leaving school early

- Second, they sum the total lifetime earnings of having a certain level of educational attainment and subtract from it the total lifetime earnings of having a lower level of education.
- This gives the net gain that a country would theoretically enjoy if that girl finished the next level of education.
- This is done for all children and also disaggregated for males and females.

Chaban and Cunningham (2011)

The equation used to generate the foregone earnings of having a higher degree is the following:

$$E_i^s = \sum_t^T \frac{e_t^{s'}}{(1+r)^t} - \frac{e_t^s}{(1+r)^t}$$

where E_i^s is the total lifetime earnings differential for an individual i with education levels who dropped out before achieving a higher educational level.

Chaban and Cunningham (2011)

- $s' = s + 1$ for s=0, 1, 2, 3 where s=0 corresponds to incomplete primary school, s=1 corresponds to primary school completed only, s=2 corresponds to secondary school completed only, and s'=3 corresponds to tertiary education
- e are the annual earnings at time t of an individual with s (or s') educational level
- t is the age at which this individual begins work and T is the age at which this individual will retire
- r is the discount rate

Chaban and Cunningham (2011)

- Finally, to calculate the total lifetime loss in earnings for all girls who were not in school in the observation year, they multiply E_i^s by the number of students in the population who did not go on to continue their education E_s.
- Then, they repeat this exercise for each s and sum together to generate the total foregone earnings of the most recent cohort of school leavers (E):

$$E = \sum_{0}^{2} E_s$$

Chaban and Cunningham (2011)

- As in Cunningham et al. (2008), they use 45 years as the length of the working life, and a 6 percent discount rate.
- Assuming that if girls had just completed the next level of education, they would earn the same average wage as those who actually did complete that level of education would over-estimate the productivity gains to education since part of that gap is likely due to a difference in abilities that cannot be attributed to differential education levels.

Chaban and Cunningham (2011)

- To account for ability bias, they introduce two adjustment factors.
- First, based on Card (1999), they assume that girls with only s level of education, if they completed s+1 years of education, they would earn wages that are 10% less than the average wage for s+1 graduates at each age throughout their work lives.
- Second, they make yet another adjustment to account for the possibility that the influx of more educated girls into the labor force will reduce the equilibrium wage for that skills segment of the labor market (using elasticities).

Chaban and Cunningham (2011)

- The average wage is taken from the ILO's KILM database. The number of girls dropping out of each grade level is from the World Bank's EDStats.

Methodology for computing the cost of inactivity and joblessness

- The estimate captures the opportunity cost of girls' inactivity and joblessness in regard to lost wages and productivity.
- The **inactivity rate** is the share of girls age 15-24 who are not working; this includes girls who are both in school and out of school.
- They consider two target scenarios: girls have the same inactivity rate as adult women (Target 1) and girls have the same inactivity rate as boys (Target 2).

Methodology for computing the cost of inactivity and joblessness)

The following equation is used to calculate the cost as foregone output to the economy:

$$Cost = IR_y - IR_* \times WAP_y \times w_y$$

where IR_y is young girls' inactivity rate; IR_* is the target inactivity rate; WAP_y is the working age population of young females; and w_y is real annual female youth wage.

Methodology for computing the cost of inactivity and joblessness

- Data for the number of female youth labor force participants is drawn from the ILO's KILM database, which projects employment data based on country-specific models.
- GDP is drawn in current US dollars from the WDI database (World Bank).

Methodology for computing the costs of adolescent pregnancy)

The following equation is used to calculate the cost as foregone output to the economy:

$$Cost = IR_y - IR_* \times WAP_y \times w_y$$

where IR_y is young girls' inactivity rate; IR_* is the target inactivity rate; WAP_y is the working age population of young females; and w_y is real annual female youth wage.

Chaban (2008) The cost of Youth Exclusion in the Middle East

- This paper explores the costs associated with youth exclusion in the Middle East by providing estimates of the economic costs to society related to youth unemployment, youth joblessness, school dropouts, adolescent pregnancy, and youth migration.

Chaban (2008) The cost of Youth Exclusion in the Middle East

- Country-specific data essential for the cost estimation is drawn from various sources, including country-based household surveys, living conditions measurement surveys, Pan-Arab Project for Family Health (PAPFAM) surveys, labor surveys, and other poverty/income surveys.
- Data on wages and unemployment for youth are drawn from the ILO (2006).

Chaban (2008) The cost of Youth Exclusion in the Middle East

Equation (1) below is used throughout the estimation in order to calculate the cost as foregone output to the economy:

$$Cost = \frac{UR_y - UR_* \times LFP_y \times w_y}{GDP}$$

Chaban (2008) The cost of Youth Exclusion in the Middle East

The equation used to generate the foregone earnings of having a higher degree is the following:

$$E_i^s = \sum_t^T \frac{e_t^{s'}}{(1+r)^t} - \frac{e_t^s}{(1+r)^t}$$

where E_i^s is the total lifetime earnings differential for an individual i with education levels who dropped out before achieving a higher educational level.

Wodon et al. (2017) IMPACT OF CHILD MARRIAGE ON EARNINGS AND PRODUCTIVITY

- While the impacts of child marriage on labor force participation and work for cash are mixed, the results are not as varied when it comes to earnings and productivity.
- To consider this relationship, we posited that child marriage can curtail women's earnings and productivity through its impact on higher fertility and – more importantly - lower educational attainment.
- They use wage regressions to analyze these potential losses, simulating earnings with both lower fertility and higher education.

Wodon et al. (2017) IMPACT OF CHILD MARRIAGE ON EARNINGS AND PRODUCTIVITY

- Similarly to Chaban and Cunningham, (2011), the authors estimate wage earning profiles based on the World Bank's I2D2 labor and living standards survey database which does not include variables measuring child marriage (or early child births).
- Therefore, the simulations implicitly assume that there is no direct impact of child marriage on earnings, controlling for education and other variables included in the wage regressions.
- Said differently, the impacts on earnings result from the impact of child marriage on educational attainment for

Wodon et al. (2017) IMPACT OF CHILD MARRIAGE ON EARNINGS AND PRODUCTIVITY

- These lead to indirect impacts of child marriage on earnings.
- T**his is a limitation of the analysis**, but data sets that have information on both earnings and the age at first marriage (or first birth) tend to support our assumption.
- For example, analysis was carried for selected countries including Niger and Nepal using existing large scale nationally representative living standards measurement surveys that have information on child marriage (in the case of Nepal) or early child births (in the case of Niger).