The impact of major crises on educational gender inequalities in Cameroon

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Abstract

The adverse impact of major crises generally results in educational losses, as exemplified by the 1980s-1990s economic and sociopolitical crisis in Cameroon. But studies so far did not clearly measure such impacts. Moreover, educational impacts generally are not disaggregated according to gender categories. The objective of this article is to highlight variations of educational gender gaps during periods of crisis. We hypothesized that the magnitude of the impact is higher for girls as the latter typically are more vulnerable to discrimination based on cultural stereotypes. However, the long-term generational time series enabled us to evidence an opposite result. Male children were actually more vulnerable to this major crisis. The educational loss for boys was estimated at -19.7%, using a new indicator for completion rates. Comparatively, the impact on girls' completion rates stood at -6.1%. We conclude that while girls are more exposed to structural, long-term discrimination due to cultural factors, boys are more vulnerable to conjunctural, short-term discrimination due to socioeconomic hardship. This could be explained by the fact that boys are more concerned with the phenomenon of child labor which adversely impacts school dropout rates. As recommendation for policy making, we suggest a better integration of gender into educational policies by taking into account specific challenges faced by boys and girls respectively. While female-oriented sensitization would focus on cultural stereotypes likely to impede girls' education in the long-term, male-oriented sensitization would focus on socioeconomic hardship likely to foster male child labor and increase educational dropouts during periods of crisis.

Introduction

The adverse impact of major crises generally results in educational losses. For instance, the COVID-19 pandemic came as a historic health crisis in 2019, affecting more than 1.5 billion students worldwide, the most vulnerable communities bearing the brunt. As a result, some gains already made towards the goals of the 2030 Education Agenda were lost (UNESCO, 2023). In an attempt to curb the global health crisis, 194 countries implemented nationwide school closures. In sub-Saharan Africa, some communities witnessed a surge in teen pregnancy as girls' exposure to male companionship increased during periods of school closures (Baker et al., 2020). Consequently, the health crisis worsened school dropout rates among vulnerable female students.

In Cameroon, there are numerous challenges regarding the supply and demand of education (MINEPAT, 2009). The average number of education years for youths age 18 years stands at 8.7 years (UNESCO-IICBA, 2024), well below the target of the fourth Sustainable Development Goal aiming at complete primary and secondary education (13 years of schooling) for boys and girls by the year 2030 (United Nations, 2015). Moreover, the average educational level remains below the target of the National Development Strategy aiming to achieve completion of the first cycle of the secondary education (10 years of schooling) by 2030 (MINEPAT, 2020).

Besides, various local crises have further impeded educational attainment in Cameroon. For instance, climate change harmfully impacts education through seasonal floods damaging schools and homes, thus causing displacements and disruption of school activities (IMF, 2024). Moreover, 850,000 children dropped out of school in the North-West and South-West regions of Cameroon between 2016 and 2020 due to the Anglophone crisis (IFRI, 2020). According to the Global Coalition to Protect Education from Attack, a similar situation was reported in the Far-North region of Cameroon where hundreds of schools were destroyed between 2014 and 2016 by the extremist group Boko Haram (GCPEA, 2018).

These successive crises had a combined negative impact on educational outcomes in Cameroon. Moreover, the decades 1980s-1990s saw the advent of a more enduring crisis whose long-term impact is still felt today. As a matter of fact, many African countries enjoyed the postcolonial period, characterized by economic expansion and great improvement in educational attainment. The average GDP growth rate in Cameroon during the 1970s reached a pick at 7.3%. However, the sharp fall in commodity prices in the early 1980s led to falling national revenue. The

country's GDP lost 33 percentage points in 7 years of recession between 1987 and 1993[1]. The crisis was amplified during the 1990s by sociopolitical unrest, following the fall of the Berlin wall in 1989 (Engel, 2009), the La Baule speech in 1990 (Koudé, 2021) and the subsequent winds of democracy in African countries.

In order to correct imbalances in the economic structure of African countries, the International Monetary Fund (IMF) and the World Bank, working with government officials, introduced the Structural Adjustment Programs (SAP). The SAP were characterized by stringent fiscal measures that "had some devastating effects on public expenditure on education, the purchasing power of teachers, quality of education, access to education, and gender gap in the provision of education at all levels" (Babalola et al., 1999; p. 79).

Several authors delved into demographic, socioeconomic and sociocultural factors useful to understand disparities in the supply and demand of education (Pilon, 1996; Lange and Yaro, 2003; Altinok, 2006; Kobiané and Pilon, 2008; Nganawara, 2016; Barry and Slifer-Mbacké, 2017; Kana, 2018; Asadi, 2020; Niang, 2022). However, studies examining educational trends in sub-Saharan Africa are scarce. Therefore, there is a need to study long term trends of education in order to compare educational gender gaps before and after major crisis break out.

Some authors examined the general pattern of educational outcomes in Africa, pointing to a positive trend in the long term (improvement of educational attainment across generations) and striking disparities due to gender inequalities (Barro and Lee, 2015; Psaki et al., 2018; Friedman et al., 2020; Baten et al., 2021; Evans et al., 2021; Loty et al., 2022). But one could expect that major crises would delay the educational expansion observable in the positive, long term trend.

Moreover, some studies have challenged the role of gender inequality in the explanation of educational trends, pointing to the greater role played by socioeconomic status. In other words, educational gaps between the poor and the rich are greater than educational gaps between boys and girls (Eloundou-Enyegue et al., 2009). Accordingly, poor girls will be the last to complete the educational transition (positive trend from low educational attainment for older women to high educational attainment for younger women). Consequently, authors concluded that educational investments should be directed toward poor girls (Eloundou-Enyegue et al., 2009; Psaki et al., 2018).

Concerning the impact of periods of crises on educational outcomes, some studies did mention the existence of fluctuations in the educational trajectory with an initial period of educational

[1] Author's calculations based on the World Bank Open Data website, consultable at https://data.worldbank.org.

expansion during decades of colonial rule (first half of the twentieth century), further expansion during the first decades of postcolonial rule (1960s-1970s), followed by subsequent periods of decline (1980s-1990s) and recovery (2000s) (Lange and Yaro, 2003; Psaki et al., 2018; Baten et al., 2021). While these studies provided a general pattern of educational trends taking into account periods of crisis, they did not provide precise measurement of the educational impact of major crisis.

Other studies probed the role of the socioeconomic background during the worldwide COVID-19 pandemic in 2019, large learning deficits being reported among poor children (Betthäuser et al., 2023). These studies provided precise measurements of the educational impacts, but they did not disaggregate impacts according to gender. As a result, it is not possible to now if the crisis affected girls more than boys or vice versa.

Besides, some authors found a negative educational impact for girls during the 1980s crisis in Nigeria and Zambia (Babalola et al., 1999). However, that study did not provide a comparative analysis of boys and girls educational impacts to determine who was more affected by the crisis.

This article provides a more precise measurement of gender-specific educational impacts of major crisis. The study is focused on the 1980s-1990s decades of economic and sociopolitical crises as case study, based on available retrospective data from the Demographic and Health Survey (DHS) conducted in Cameroon in 2011.

Therefore, the article will examine the following research questions: What are the variations of educational attainment in Cameroon between school-age cohorts educated before and after the beginning of the 1980s crisis? What are the variations of educational attainment with and without the crisis? Did the crisis have the same educational impact for boys and girls? What is the magnitude of the impacts for boys and girls?

The objective of this study is to highlight variations of educational gender gaps during periods of crisis. We can expect the magnitude of the impact to be higher for girls as the latter are more vulnerable to discrimination based on cultural stereotypes.

The article will contribute to the existing research in two ways. Firstly, a new indicator is designed to measure educational attainment through completion rates. Traditionally, the completion rate is computed as the proportion of individuals in the relevant age group who have completed the last grade of a given level of education (UNESCO, 2022). But this approach underestimates progress made by individuals who have partially completed an educational cycle. The new completion rate is computed at individual level as the share of educational cycle

completed by an individual. Correspondingly, the completion rate for a cohort is the average of individual completion rates. It is the share of educational cycle completed by all individuals of the cohort.

Secondly, the article will conceptualize the study of fluctuations in educational trends (educational cycle) using a novel approach based on generational time series. Thirdly, this study will contribute to better understanding of the gendered nature of crises by explaining why crises could affect boys and girls in different ways.

The study comprises three parts. The first part examines the conceptual framework. The second part presents data and methods. The third part outlines a discussion of main findings and educational policy implications.

1. Conceptual framework to assess the impact of crises on educational gender inequalities

1.1 The educational cycle

The notion of educational cycle is defined in this article based on the traditional notion of economic cycle, referring to periods of fluctuations in economic activities, comprising four phases: expansion, peak, contraction, and recovery (Bartolini, 2024). In a similar way, the educational cycle refers to long-term trends of educational attainment, with periods of expansion followed by slowdown. The periods of expansion and contraction are linked to the economic cycle. During economic expansion, economic activities are soaring and the labor market is in greater need of skilled workers, which in turn increases the demand of education by households, as the latter expect better income. On the other hand, economic recession is associated with lower demand for skilled labor, which in turn translates into lower demand for education.

Furthermore, the increase of household income during periods of economic expansion enables them to bear the cost of sending their children to school. When income plummet during economic downturn, households spending for education tend to decrease, resulting into declining educational outcomes.

Indeed, the educational cycle and the economic cycle can be viewed as twin cycles. The cyclical nature of educational trends is apparent, not only from the demand side as shown above, but also from the supply side. During economic expansion, public spending for education increases, as the government collects more revenue. During periods of recession, the decrease of public

revenue leads to the corresponding decrease of educational budget, resulting into declining outputs in the educational system.

Finally, the business cycle is also dependent on the human capital cycle because capitalistic growth based only on increased physical investments is less productive in the long run than qualitative growth based on investment in human capital (skilled workforce).

1.2 Modelling the educational cycle

The following equation helps to model the main phases of the educational cycle.

$$E_{C_t} = \beta_0 + \beta_1 C_t + \beta_2 C_t^2 + \beta_3 C_t^3 \qquad (1)$$

where:

C_t is the cohort reaching the postschool age of 25 years during the year t

E_{C_t} is the average educational level of cohort C_t

β_0, β_1, β_2 and β_3 are polynomial coefficients used to capture the fluctuations of the cycle

In this line of reasoning, E_{C_t} represents the educational trajectory of the country. This trajectory describes the state of the educational transition at time t when cohort C_t was educated.

It should be noted that the educational transition is defined as a historical process characterized by initial low educational level for men and women (phase 0), subsequent expansion of male education and increase of gender gaps (phase 1), then a faster increase of female educational attainment translating into narrowing gender gaps (phase 2) and finally the last stage characterized by higher educational attainment for men and women (phase 3) (Baten et al., 2021). The educational transition is accelerated during periods of educational expansion while being delayed during periods of crises.

Given the educational trajectory for boys and girls, we obtain gender gaps with the difference $G_{C_t} = E_{C_t Boys} - E_{C_t Girls}$. According to the educational transition theory, G_{C_t} describes a Kuznet curve with the characteristic inverted U shape (Baten et al., 2021). This shape is due to the fact that gender gaps are expected to increase during the first phase of the transition and decrease during the second phase.

While E_{C_t} is the educational trajectory, the velocity or educational growth rate is defined as the derivative (with respect to generational time) of the educational trajectory.

$$\frac{dE_{C_t}}{dC_t} = \beta_1 + 2\beta_2 C_t + 3\beta_3 C_t^2$$

This is a quadratic function graphically represented by a parabola. If the coefficient β_3 is negative, the parabola will be concave-down, corresponding to a maximum. In this case, the educational growth rate is characterized by an initial increase (educational expansion) followed by a subsequent decrease (educational slowdown).

Based on our theory, we can hypothesize that $\beta_3 < 0$ since we expect an initial period of educational expansion (postcolonial period during the decades 1960s-1970s) followed by a period of educational decline (decades 1980s-1990s).

While the first derivative of the educational trajectory is the velocity (educational growth rate), the second derivative is the educational acceleration.

$$\frac{d^2E_{C_t}}{dC_t^2} = 2\beta_2 + 6\beta_3 C_t$$

The inflection point is the point of the educational curve where the second derivative vanishes and changes its sign. The second derivative (educational acceleration) changes from a positive value (concave upward) to a negative value (concave downward). We derive the following relation:

$$2\beta_2 + 6\beta_3 C_t = 0$$

$$C_t = \frac{-2\beta_2}{6\beta_3}$$

$$C_t = \frac{-\beta_2}{3\beta_3}$$

This relation determines the cohort corresponding to the inflection point. The inflection point here is interpreted as the point where the adverse impact of the crisis starts affecting educational outcomes.

2. Measuring the impact of crises using generational time series

2.1 Sampling methodology of the Demographic and Health Survey (DHS)

The analysis is based on data from the Demographic and Health Survey conducted in Cameroon in 2011. Information were collected on 14,214 households comprised in a countrywide sample representing all 10 regions of Cameroon, including 6,490 urban households and 7,980 rural

households. The unit of analysis for this study is the member of the household aged 25 years and over (post-school age) at the time of the survey. The analysis file was extracted from the DHS database containing information on individual members of the household. The sample size for this study is 26,731 people, including 12,540 men and 14,191 women.

The DHS survey was implemented by the Cameroon National Institute of Statistics with the support of the United States Agency for International Development (USAID-ICF-Macro). The DHS survey objective was to collect socioeconomic and health information, including household characteristics. The rich set of variables collected is helpful for conducting various multivariable analyses needing several confounding variables. The DHS VI methodology was used, with two-stage cluster sample and an overall response rate of 99.0%.

In the first stage, 580 enumeration areas were selected using probability proportional to size sampling (the size of the enumeration area being the number of households). In the second stage, households were selected using equal probability systematic sampling, based on an updated listing of households obtained from the 2005 census. Data collection procedures were pre-tested and training was provided for the field staff over a 3-week period in October 2009. The DHS survey report provides all details concerning survey design, management and data quality (National Institute of Statistics, 2012).

2.2 Questionnaires and data collection

In both countries, three questionnaires were designed respectively for households, women and men, reflecting DHS model questionnaires. The first section of the household questionnaire contains information about household members including their educational level. It should be noted that various State and non-governmental stakeholders contributed to frame the questionnaires. Procedures and questionnaires for standard DHS surveys have been reviewed and approved by the ICF International Institutional Review Board as well as the National Ethical Committee. Interviews were conducted only when the respondents provided voluntary informed consent. Moreover, experienced field reviewers verified questionnaire logic and coherence. Independent interviews helped to confirm that questions were asked accurately. High level field visits were carried out by survey supervisors to monitor data quality. Indeed, the standard DHS methodology used for this survey guarantees the credibility of the results of the analyses carried out based on DHS data.

2.3 Estimation of the dependent variable measuring educational attainment

In all households interviewed, the household head or his representative answered questions concerning the educational level for all members of the household, including adults aged 25 years and above (post-school age). At this age, virtually all individuals sampled had already stopped their studies and could therefore be asked about their final school level. Furthermore, authors studying retrospective trends of educational attainment generally sample individuals aged 25 years and above (Baten et al., 2021).

Within the framework of this article, the educational attainment was measured through the completion rate at lower secondary education, in line with the fourth Sustainable Development Goal (SDG) and the National Development Strategy (NDS). As noted above, this study introduces a new indicator to measure educational attainment through completion rates. The new completion rate is computed as the share of educational cycle completed by an individual or a cohort.

Noteworthily, the new completion rate is a quantitative variable adequate for statistical analysis. With this indicator, it is possible to estimate various statistics including the mean and standard error. The minimal value for the completion rate in the sample is 0% (unschooled people) while the maximal value is 100% (people who have completed the lower secondary education corresponding to 10 years of education). For a person who completed 9 years of education (partial completion), the completion rate is 90% (9/10).

2.4 Operationalization of the independent variable measuring the cohort effect

In all sampled households the household head or his representative answered questions concerning the age of household members, including adults aged 25 years and above. For the purpose of this analysis, people interviewed were regrouped into seven ten-year cohorts as this approach reduces issues related to age misreporting. The oldest cohort, coded with the value 0, refers to people of the age group 85-94+ years, born in 1917-1926. The youngest cohort, coded with the value 6, refers to people of the age group 25-34 years, born in 1977-1986.

2.5 Methods used to measure educational impacts using generational time series

A time series is a set of observations x_t, each one being recorded at a specific time t (Brockwell et Davis, 2002; Viano et Philippe, 2004). On this basis, a generational time series is defined as a set of observations x_{C_t}, each one being recorded for a specific birth cohort C_t born at time t. The resulting educational time series is a set of observations E_{C_t} representing the educational

attainment of successive generations (educational trend). In this way, it is possible to measure educational trends across generations (Loty et al., 2022).

Gender gaps are modelled based on educational attainment using the formula

$$G_{C_t} = E_{C_t Boys} - E_{C_t Girls}$$

We use a polynomial to derive a theoretical Kuznet curve from the empirical gender gaps series.

$$G_{C_t} = \beta_0 + \beta_1 C_t + \beta_2 C_t^2 + +\beta_3 C_t^3$$

Furthermore, it is possible to show how gender gaps varied for cohorts educated during the period of crisis. For this purpose, the impact of the crisis is measured directly for boys and girls. This is not a simple comparison between educational outcomes for girls and boys before and after the beginning of the crisis. While this approach could provide an initial estimation of the effect of the crisis, such an estimation could seriously underestimate the magnitude of the impact. To grasp the full impact, one should compare educational outcomes observed after the beginning of the crisis and educational outcomes expected if the crisis did not happen (hypothetical counterfactual).

In order to obtain a precise measurement of the impact of the crisis, it is necessary to model the educational trend that prevailed before the advent of the crisis. Based on our theory, we expect a period of educational expansion (post-independence period during the decades 1960s-1970s) followed by a period of educational decline (decades 1980s-1990s).

The formula (1) presented above models a period of educational expansion followed by a period of crisis. This formula is used below to represent the educational trajectory for the entire period (trend with crisis).

$$E_{C_t}^{with} = \beta_0 + \beta_1 C_t + \beta_2 C_t^2 + \beta_3 C_t^3$$

The following formula represents the educational trajectory taking into account only the initial period of educational expansion (trend without crisis).

$$E_{C_t}^{without} = \beta_0' + \beta_1' C_t + \beta_2' C_t^2$$

This is a quadratic function graphically represented by a parabola. If the coefficient β_2 is positive, the parabola will be concave-up, corresponding to a period of expansion. The impact I_{C_t} is obtained by comparing the educational attainment with and without the crisis.

$$I_{C_t} = E_{C_t}^{with} - E_{C_t}^{without}$$

Furthermore, we disaggregate the impact to obtain impacts for girls and boys. As a result, we obtain the 7 generational time series presented in Table1. The table shows that the coefficient of determination (R^2) is high for all 7 regressions, a strong indication that the regression models used are adequate to model our empirical data. These regressions have been used to predict future values.

Table 1: Coefficient of determination (R^2) for regression models based on 7 generational time series (%)

Generational time series	Coefficient of determination
Gender Gaps	99,6
Male Completion Rate Adjusted (with crisis)	98,7
Female Completion Rate Adjusted (with crisis)	100,0
Male and Female Completion Rate Adjusted (with crisis)	98,8
Male Completion Rate Adjusted (without crisis)	98,1
Female Completion Rate Adjusted (without crisis)	99,1
Male and Female Completion Rate Adjusted (without crisis)	99,3

3. Results of generational time series modelling educational fluctuations

The results of generational time series modelling are presented below to determine the pattern of long-term trends of educational attainment for boys and girls, especially the fluctuations of educational attainment during periods of crisis. Thereafter, the pattern of gender gap variations across generations is described. Finally, gender-sensitive educational impacts are discussed to highlight specific mechanisms useful to understand how boys and girls were affected during the 1980s-1990s crisis.

3.1 Determining the impact of the crisis on educational gender inequality

The Graphic 1 shows long-term trends of completion rates in Cameroon for boys, girls and all children. The first ten-year cohort is characterized by low educational level at the inception of modern education in Africa by missionary missions by the start of the 20th century. Thereafter, modern education picked up during colonial rule (2nd-4th cohorts) and was further expanded by postcolonial governments by the second half of the century (5th-6th cohorts). However, the graphic shows a decline in educational attainment for the 7th cohort (people born in 1977-1986). This cohort corresponds to children educated during the economic and sociopolitical crises that swept African countries during the 1980s-1990s.

Indeed, this period of major crisis delayed the educational transition. The completion rate for the youngest cohort is still below 50%, an indication that the objective of universal education at lower secondary cycle is not yet within reach.

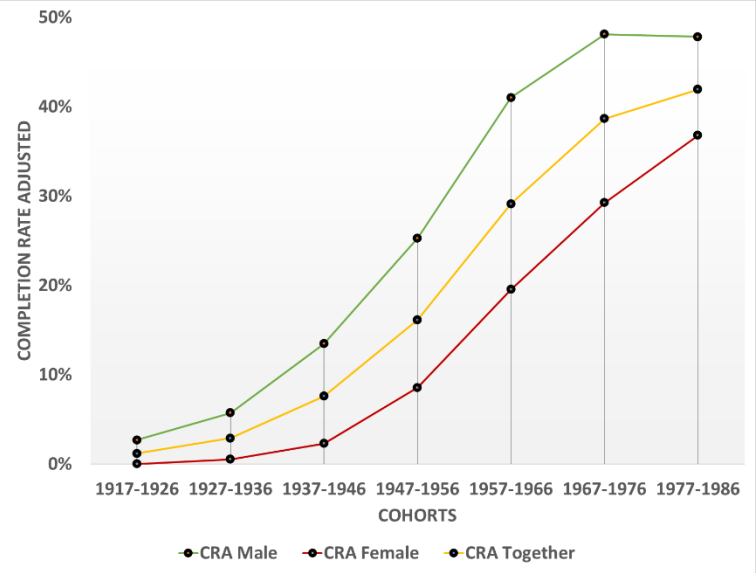
Moreover, Graphic1 shows that the series of male educational attainment is always above the series of female educational attainment. Therefore, there is a structural pattern of educational discrimination based on gender. Gender inequality is linked to cultural factors because a girl typically is expected to learn how to be a good wife and manage a household. As a result, the need for modern education is less stressed for girls, especially in rural areas. However, some progress is visible in large cities where modern education is necessary to access the job market. In other words, the opportunity cost for girls not going to school is higher in urban areas.

Moreover, an examination of Graphic 1 shows that the last cohort witnessed a slowdown for male children while female children maintained educational progress. Consequently, the gender gap between the two series is narrowing during the period of crisis. This finding is contrary to our hypothesis as we traditionally expect girls to be more vulnerable to gender discriminations. In a nutshell, girls are more exposed to structural, long-term gender inequality, while boys are more exposed to conjunctural, short-term gender inequality.

Besides, Graphic 2 features long term trends of educational gender gaps. The empirical data describe the Kuznet curve characterized by an inverted U shape. This confirms the theory of educational transition where gender gaps are expected to soar during the first phase while declining during the second phase. The graphic shows a sharp decline of gender gaps for the last cohort, thus confirming that the crisis contributed to narrowing gender gaps.

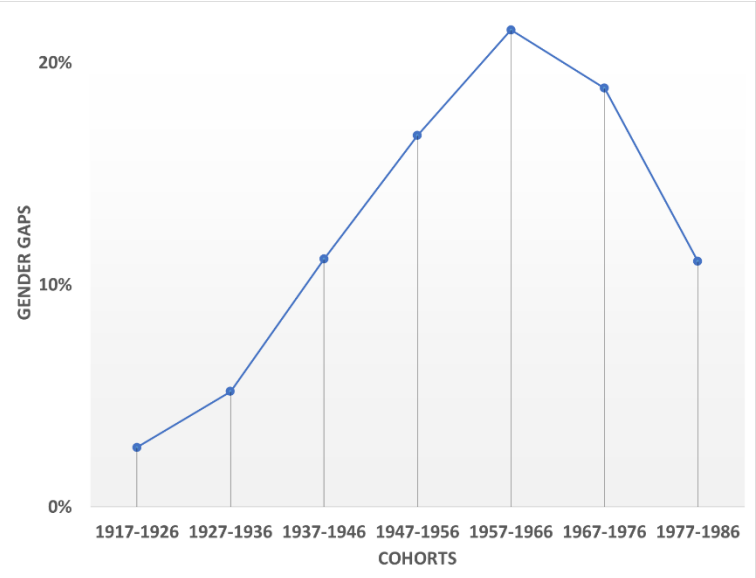
However, this effect is relatively positive because only girls maintained educational progress during the crisis, while boys experience educational setbacks. In order to achieve genuine progress toward gender equality, policies should focus on maintaining educational progress for boys while accelerating educational progress for girls.

Graphic 1: Long term trends of gender-specific educational attainment in Cameroon



CRA: Completion Rate Adjusted (lower secondary education)

Graphic 2: Long term trends of educational gender gaps in Cameroon



3.2 Measuring the impact of the crisis on completion rates

Graphic 3 helps to visualize the impact of the crisis for all children. The green series shows the trend of the completion rate without the crisis while the red series shows the trend of the completion rate with the crisis.

An examination of the red series reveals that the trend of the completion rate slowed down between the 6th cohort (before the crisis) and the 7th cohort (after the start of the crisis). However, the completion rate continued to increase (from 38.6% to 41.9%), albeit at a slower

pace. Therefore, a comparison of educational rates before and after the start of the crisis would not provide a clear sign of negative impact. To accurately measure the magnitude of the impact, we need to observe both series.

The graphic shows that for the 7th cohort (period of crisis), the green series is above the red series. In other words, we can conclude, based on the pre-crisis trend, that the educational expansion witnessed during the decade 1970s would have led to a higher completion rate for boys, at 55.2% (without crisis) instead of 41.9% (with crisis). By computing the difference between the two figures we obtain a negative impact, at -13.2%.

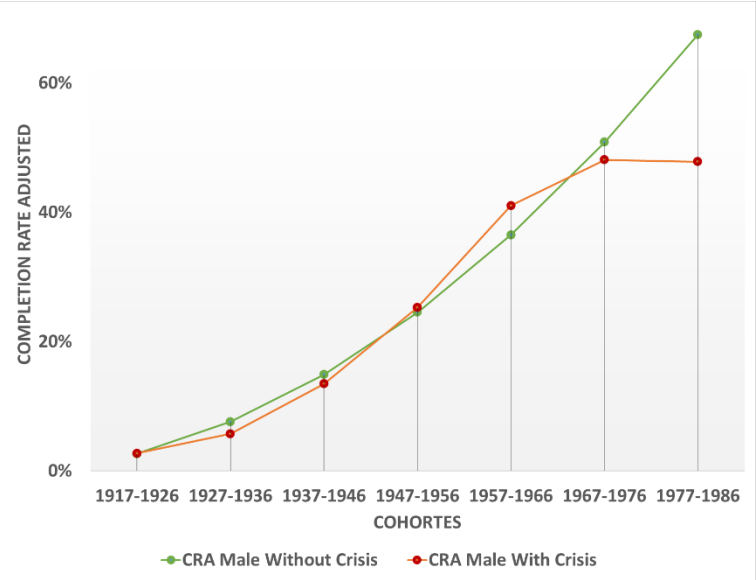
Graphic 3: Long term trends of educational attainment for all children in Cameroon (with and without crisis)

3.3 Measuring the impact of the crisis on boys' completion rates

Graphic 4 presents the impact of the crisis for boys. The red series shows a decline for boys' completion rates between the 6th cohort (before the crisis) and the 7th cohort (after the start of the crisis). The completion rate slightly declines by -0.3% (from 48.1% to 47.8%). However, this decline does not reveal the full impact. To accurately measure the magnitude of the impact, we need to observe both series.

The graphic shows that for the 7th cohort (period of crisis), the green series is above the red series. In other words, we can conclude, based on the pre-crisis trend, that the educational expansion witnessed during the decade 1970s would have led to a higher completion rate for boys, at 67.5% (without crisis) instead of 47.8% (with crisis). By computing the difference between the two figures we obtain a higher impact, at -19.7%.

Graphic 4: Long term trends of educational attainment for male children in Cameroon (with and without crisis)



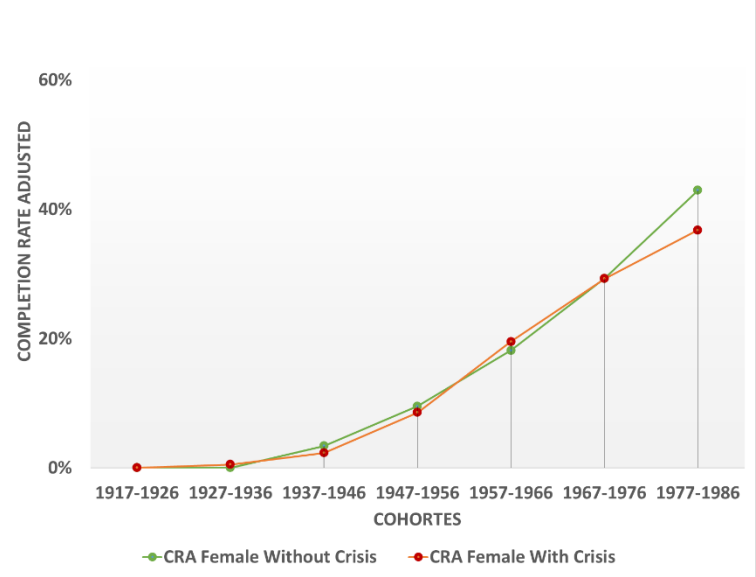
3.4 Measuring the impact of the crisis on girls' completion rates

Graphic 5 highlights the impact of the crisis for girls. An examination of the red series reveals that the trend of completion rates experienced a moderate slowdown between the 6th cohort (before the crisis) and the 7th cohort (after the start of the crisis). However, completion rates continued to increase (from 29.2% to 36.8%).

Therefore, a comparison of educational rates before and after the start of the crisis would not provide a clear sign of negative impact. To accurately measure the magnitude of the impact, we need to observe both series.

The graphic shows that for the 7th cohort (period of crisis), the green series is above the red series. In other words, we can conclude, based on the pre-crisis trend, that the educational expansion witnessed during the decade 1970s would have led to a higher completion rate for girls, at 42.9% (without crisis) instead of 36.8% (with crisis). By computing the difference between the two figures we obtain a negative impact, at -6.1%.

Graphic 5: Long term trends of educational attainment for female children in Cameroon (with and without crisis)



4. Discussion

From the preceding, it is safe to conclude that educational impacts of the crisis vary according to gender. While girls are more exposed to structural, long-term discrimination due to cultural factors, boys are more vulnerable to conjunctural, short-term discrimination due to socioeconomic hardship. This could be explained by the fact that boys are more concerned with the phenomenon of child labor. During economic crisis, formal jobs are scarce and households tend to show some resilience through informal activities. Consequently, boys would be encouraged to share in bearing the burden of family expenses by working outdoors without adult supervision. In turn, child labor would definitely lead to increased school dropouts for male children.

Comparatively, girls would typically assist their mothers in domestic activities or family business. This type of activity is more supervised and therefore leads to relatively lower dropout rates for female children. Furthermore, educational policies during periods of crisis were more favorable to female education. The Jomtien conference in 1990 on education for all emphasized the need to promote the education of girls (UNESCO, 1990; Henaff et al., 2017). Hence, educational policies can explain the better performance of girls, especially in large cities where the educational system is more established.

Some limitations could be raised concerning the results of this study. First, a selection effect due to mortality among older cohorts was possible since more educated members of those

cohorts were more likely to have survived at the time of the survey than their less educated counterparts. People who are more educated are more likely to survive because they earn relatively higher income and enjoy better life hygiene.

However, this limitation would rather reinforce our conclusions. Indeed, if the educational level of dead people is taken into account, we end up with a much lower completion rate for older generations, which would result in lowering the initial terms of the series. Consequently, the slope of educational attainment would grow steeper. Hence, the pre-crisis trend would show an even faster educational growth rate, which would in turn increase the value of expected educational outcomes without the crisis, with corresponding higher negative impacts.

Second, this study was carried out using DHS data from Cameroon as case study. Future studies could examine the case of several countries to see how the educational impacts of a crisis vary across countries. Third, the article refers to the 1980s-1990s crisis. Future studies could examine more recent crises such as the COVID pandemic as more precise data continue to emerge for analysis.

Conclusion

At this stage, it is possible to answer the questions raised at the outset. It is plain that the crisis had a sizable negative impact on educational outcomes for children educated after the beginning of the crisis. Moreover, boys have been sharply affected by the crisis compared to girls. When comparing completion rates before and after the beginning of the crisis, we cannot fully evidence the full impact of the crisis. Rather, the comparison between the expected educational outcomes without the crisis and observed outcomes with the crisis helps to measure the magnitude of educational impacts.

The results of this study lead to specific policy implications. First, it is necessary to better integrate gender into national policies by taking into account specific challenges faced by boys and girls respectively. While female-oriented sensitization would focus on cultural stereotypes likely to impede girls' education in rural areas, male-oriented sensitization would focus on socioeconomic hardship likely to foster male child labor and increased educational dropouts in large cities.

Second, international policies should improve the integration of gender into action plans. Practically, gender indicators should include indicators targeting girls and indicators targeting boys. For instance, male child labor rate is a pertinent indicator of gender inequality reflecting educational vulnerability for male children.

Third, data visualization tools should be developed based on generational time series and Power BI technology. This would make it easier to navigate through dynamic tables and graphics featuring patterns of educational transitions in various countries and regions of the world. This would enable analysts and policy makers to monitor educational trends for vulnerable populations and mitigate the severity of asymmetric crisis affecting specific groups.

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