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Determinants of labor market gender inequalities in Cameroon, Senegal and Mali: the role of human capital and the fertility burden[1]

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Abstract. The purpose of this study is to measure the impact of human capital and the fertility burden on labor market inequalities between men and women, in particular as regards access to the most highly paid jobs. The study covers Cameroon, Mali and Senegal, three countries in sub-Saharan Africa with similar socioeconomic characteristics. The findings show that, even with the same level of education as men, women still stand less of a chance of getting into the top job segment, because education is less efficient for them. This result provides evidence of gender discrimination in all three countries. A fertility burden in terms of a large family is another obstacle to female access to high quality jobs. It has a direct negative impact in the two Sahelian countries (Mali and Senegal) and an indirect negative impact via its interaction with education in Cameroon and Senegal. In these two countries, the more children a woman has, the lower her marginal return to education. These findings combine to show that a woman's labor market situation improves in all three countries when fertility declines, either directly through greater access to top jobs or indirectly via better human capital efficiency.

Keys words: Female labor, Gender Inequality, Labor market, education return, Fertilty.

JEL codes: J13, J22, J24.

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1. Introduction

Although many African countries have more women than men, females are less likely to enter the labor market and secure equivalent jobs. Indeed, when they are employed, women are generally in a less advantageous position than men, being overrepresented in the informal sector and casual jobs and earning less in the formal sector. In this study, we focus more specifically on gender disparities in access to high job status or "top jobs" (i.e. prestigious jobs including professional workers and managerial staff) in three African countries (Cameroon, Mali, and Senegal). The rationale behind this choice is that the vast majority of jobs (in the informal sector and the agricultural sector) in the sub-Saharan Africa labor market are very low quality (ILO, 2007). So there is no competition over access to these jobs. The real issue is about securing a job in the tiny, but lucrative wage job sector (public and private). We restrict our analysis to those holding a top position to circumvent the insecure nature of certain employment at the bottom end of the wage job sector. To be more specific, we assess how far human capital and the fertility burden go towards explaining disparities between men and women in access to top jobs.

Many studies have been made of gender differences in the labor market, with contrasting results. Some studies explain the lower position of women in the market mainly by means of differences in human capital accumulation, arguing that women who are as well educated as men secure more or less the same earnings or status in the labor market: see Glewwe (1990); Siphambe & Thokweng-Bakwena (2001); Doumbia A. G & Kuepie M(2008); Nordman & Wolff (2009), among others. However, other studies come to more ambivalent conclusions, showing that although investment in human capital improves the relative position of women in the labor market, it does not eradicate the differences (Weichselbaumer & Winter-Ebmer (2005); Glick & Sahn (1997); Nicita & Razzaz (2003), etc.). Therefore, women with the same human capital level as men are still at a disadvantage in the labor market.

In addition to human capital inequalities, one of the reasons why women are still at a disadvantage in the labor market is the burden of procreation. So it is important to analyze the links between reproductive behavior and labor market integration. The findings of empirical studies on this focus are also varied, as regards

both the female labor supply and the position of women who are in the labor market. On the first point, whereas Bloom et al. (2009), Schultz (2008), Angrist and Evans (1998), Moschion (2009, 2011, 2010), and others show that a high fertility rate reduces the odds of female participation in the labor market, others such as Agüero and Marks (2011), Hirvonen (2009), Iacovou (2001) and Lopez (2005) conclude that there is no link between the two phenomena. Once women are in the labor market, fertility can have short-term impacts due to a loss of earnings brought about by temporary postnatal withdrawal from the labor market and long-term impacts due to the loss of professional experience associated with maternity leave and part-time work (Jacobsen, J., Pearce, J., Rosenbloon, J. 1999). The majority of the studies find that procreation has little effect on men's labor supply and productivity, unlike women (Frenette, 2010), and that, even where an effect is found, it tends to be positive (Angrist and Evans, 1998; Moschion, 2011).

A question that has to be asked in any analysis of links between the labor market, human capital and human reproduction is whether there is a possibility of endogeneity between the phenomena. This endogeneity would be essentially due to the trade-off that households have to make between investing in work and investing in the family (Becker, 1991). In this study, we test the existence of this endogeneity bias using primary and secondary infertility as instruments for fertility, in keeping with Agüero and Marks (2008, 2011). Education can also be potentially endogenous. Yet we do not have an instrument, as we do with fertility, to diagnose this. However, the endogeneity of education is less of a concern than that of fertility, as tests on education endogeneity generally find divergent results (Kuepie, Nordman and Roubaud, 2009). Even with fertility, the findings show that although infertility is a good instrument, the tests do not reject the exogeneity of fertility in the equation of women's access to top jobs.

The analyses reveal that the fertility burden prevents women from accessing high job status in both Sahelian countries (Mali and Senegal). In Cameroon, however, fertility is not a direct obstacle to female performance in the labor market. The men, irrespective of their country, have no offspring-induced constraints on their professional careers. Gender has a very pronounced effect on human capital. Irrespective of the country, women's access to high quality jobs is hampered by their lower educational capital endowment. Yet even if they had the same level of

education as the men, they would still be at a disadvantage. This study also finds that marginal education efficiency varies with family size in Cameroon and Senegal: the more children a woman has, the lower her return on one year of education. This pattern is not observed for men.

The rest of this paper is organized as follows. The second section describes the socio-demographic and economic situation in the three countries. Section three presents some stylized facts about inequalities between women and men in the labor market. The fourth section discusses the data used and the methods of analysis. Section five analyzes the results and the last section concludes.

2. Socio-demographic and economic situation in the three countries

In terms of their socio-demographic characteristics, the three countries present both similar and distinct socio-cultural and demographic features, which could influence participation and the position of men and women in the labor market. The most recent estimates set Cameroon's population at 20 million compared to 15 million in Mali and 12 million in Senegal. One characteristic shared by the three countries is their high population growth rate (more than 2.5% a year)2.The demographic boom observed here is due mainly to decades of high fertility and declining mortality3. Yet these countries have different levels of urbanization4: approximately three-tenths of Mali's population live in city centers, compared to four-tenths in Senegal and a little more than five-tenths in Cameroon. The following table presents some socio-demographic indicators taken from the demographic and health surveys (DHS) conducted in the three countries between 1995 and 2005.

[2] This rate is estimated respectively at 3.6% in Mali, 2.7% in Cameroon and 2.5% in Senegal.

[3] Although the HIV pandemic tempers this decrease in Cameroon.

[4] Despite the usual differences in the city concept.

Table 1: Socio-demographic indicators for Cameroon, Mali and Senegal

Subjects and indicators	Cameroon		Mali		Senegal	
	1998	2004	1995/96	2006	1997	2005
% of girls from 15 to 19 already mothers or pregnant with their first child	31	28	41	35.5	22	22
Rate of teenage fertility from 15 to 19 (%)	142	138	187	188	110	101
Total fertility rate	5.2	5.0	6.7	6.6	5.7	5.3
% of women who are household heads	22.4	24	8.3	12	18.4	23.1
Age at first union, women	18	18	16	16.6	18	19
Age at first union, men	25	25	26	25.8		28
Age gap at first union (year)	7	7	10	9	-	10
Proportion of women in polygamous marriage	33	31	44.3	39.2	46	39.8
Proportion of men in polygamous marriage	18	11	27.3	27.9	22	20
Ratio% of women/% of men in a polygamous marriage	1.9	2.8	1.6	1.4	2.1	2.0
Female literacy rate, 15 years and over		64.8		17		34.6
Male literacy rate, 15 years and over		81.3		37.2		53.5
Ratio of female/male literacy rate		0.8		0.5		0.6
% of women with secondary education and higher	33.3	39.1	7.1	10.4	12.5	15.2
% of men with secondary education and higher	45.8	54.3	15.2	21.5	20.5	30.1
Ratio of% of women/% of men with secondary education and higher	0.7	0.7	0.5	0.5	0.6	0.5

Source: DHS Reports

As regards fertility observed over the period of study, it is still particularly high in Mali where the total fertility rate (TFR) remained above 6.5 children per woman in 1995/96 and 2006. In Senegal, fertility decreased slightly. The TFR fell from 5.7 children per woman in 1997 to 5.3 in 2005. In Cameroon, the level of fertility remained almost stable at around 5.1 children on average per woman from 1998 on.

Correlatively with this general stability of the fertility level, teenage fertility is high in the three countries, with more than 100 births for one thousand girls aged 15 to 19 years. A large proportion of girls aged 15 to 19 years at the time of the surveys were already mothers or pregnant. This proportion, which remained around 22% in Senegal in 1997 and in 2005, fell in Mali from 41% in 1995 to 36% in 2006. It was close on 30% in Cameroon in both 1998 and 2004. The fertility burden affects only the women and is added to other domestic activities (household chores, child and elderly care, etc.). All this can prevent them from attaining a high level of education and later engaging in economic activities, at least the most demanding in terms of availability and/or human capital.

In patriarchal societies, prevalent in the countries studied, women, married or not, usually live in households headed by men. Few women are heads of their own household. This is the case with 12% of the women aged 15 to 49 years in Mali in 2006, 23% in Senegal in 2005 and 24% in Cameroon in 2004. Girls, especially those in rural areas, are not always free to choose their marriage partner. Their early entry into marriage (median age at first union is 16 to 17 years in Mali, and 18 to 19 years in Cameroon and Senegal) is the main factor in the early pregnancies and early child bearing observed in these three countries. The fact that women enter into marriage very young compared to men (whose age at first marriage is 8 to 10 years higher) contributes to increasing gender inequalities in human capital formation and consequently determines labor market access and relative positions. An indicator of the absence of female autonomy and household management is the percentage of women in a polygamous union. This proportion is high in the three countries: three women out of ten in Cameroon and about four women out of ten in Senegal and Mali live in a polygamous union where co-wives share the same husband.

There are significant literacy and education differentials, two key elements of human capital, between the three countries studied and between the men and women in these three countries. The proportion of women aged 15 or more who are literate, i.e. who can read a simple sentence in a national language (mostly French), ranges from 17% in Mali in 2006 to 35% in Senegal in 2005 and 65% in Cameroon in 2004. Everywhere, women post substantial literacy deficits compared to men. This deficit is 50% in Mali, 40% in Senegal, and 20% in Cameroon. As regards education, the percentage of women with a secondary school education was 10% in Mali in 2006, 15% in Senegal in 2005 and 39% in Cameroon in 2004. Here again, the relative gaps are huge compared to men: 50% in Mali and Senegal, and 30% in Cameroon. These gender ratio gaps rank Mali, Senegal and Cameroon among the low literacy and education equity performers. A World Bank report (World Bank, 2009) predicts that this situation is likely to increase because of the negative impact of the financial and economic crisis, which has made women from 33 countries particularly vulnerable, including the three countries studied here.

The 2009 Human Development Report sums up the gender-related socio-demographic inequalities, ranking countries by their gender inequality score in education, health and income. Cameroon is ranked 129th, Senegal 140th and Mali

153rd (UNDP, 2009). These ranks are consistent with the figures presented above. Yet the three countries are working to achieve gender equity, especially Mali, followed by Senegal and then Cameroon. Let's now review the literature on inequalities in the labor market.

3. Literature review

Many studies address the issue of labor market disparities between men and women in both developing countries and developed countries. We can place these studies very simply in two broad categories: the economic approach and the "sociological feminist" approach.

Concerning the economic approach, Becker's theory (1991) argues that women's important role in reproduction reduces their labor market involvement and/or productivity, and hence their human capital investment. At the empirical level, econometric studies have endeavored to prove and measure inequalities between women and men in the labor market by analyzing income differences by gender. Indeed, since Oaxaca and Blinder (1973) made their seminal contribution to the income gap decomposition, there have been several attempts to break down the average gender gap into two parts: one due to different human capital endowments and the other due to gender differences in the return to human capital. The Oaxaca and Blinder decomposition and its later developments prompted a number of empirical studies measuring the origin of inequalities between men and women in the labor market. For example, Glick and Sahn (1997) show that differences in individual characteristics in Guinea explain 45% of earnings differences between self-employed men and women and 25% among public sector employees, while women in the private sector earn more than men. Armitage and Sabot (1991) find wage gaps in the public sector in Tanzania, but nothing in the Kenyan labor market. Glewwe (1990) finds no gender differences after controlling for individual characteristics in Ghana. Women also seem to be better rewarded in the Ghanaian public sector. Siphambe and Thokweng-Bakwena (2001) argue that most of the wage gap between men and women in the public sector in Botswana is due to the differences in their background. For Appleton et al. (1999), the public sector in Uganda and Côte d'Ivoire practices less gender-based wage discrimination than the private sector.

Nicita and Razzaz (2003) study wage gaps by gender in an analysis of the textile industry in a stage of economic growth. Their decomposition clearly shows that education and potential experience largely determine wage differentials. But they also observe that urbanization slightly reduces the residual wage gap between men and women.

Actually, the share of earning differences between men and women explained by human capital (education, experience and seniority) may depend on the number and the quality of control factors taken into account. For example, Nordman and Wolff (2009) use paired employee-enterprise data on the Morocco manufacturing sector to better control for, in addition to employee characteristics, the effects of employers' characteristics on the gender wage gap. They find that the gap's magnitude becomes almost insignificant. Yet this analysis does not cover all sectors, which means that the findings cannot be deemed to apply across the board. Nordman and Roubaud (2005) re-evaluate the human capital returns by sex and explain a larger share of pay gaps by gender in all sectors of Madagascar's economy. To this end, they pair data from two original 1998 surveys conducted in Madagascar (an employment survey and a biographical survey) reporting on individuals' current and past employment earnings. Their results show that using career tracking variables dramatically increases the share of the explained gender gap.

Although there is an extensive body of economic literature on the impact of procreation on the female labor supply and female productivity in the labor market (see Bloom et al. (2009); Kogel (2004); Schultz (2008); Angrist and Evans (1998); Moshin (2011; 2010, 2009); Agüero and Marks (2008, 2011); Hirvonen (2008); Iacovou (2001); Lopez (2005); Rosenbloom et al. (1999); and Frenette (2010), few studies analyzing the differentials between men and women in the labor market explicitly consider the fertility burden of women as an explanatory factor of gender differences. This consideration would not only further reduce the proportion of the unexplained gap, but would also re-evaluate the inequalities attributed to education, because reproduction, especially in a context of high fertility, is negatively correlated with the woman's level of education. However, a number of recent studies do take into account the effect of unobserved heterogeneity either by controlling for selection on entry to the labor market (Nordman and Roubaud, 2005; Badel and Peña, 2010,) or by dealing with the endogeneity of education (Hansen and Wahlberg, 2005).

Although consideration of selection and/or endogeneity sometimes provides a better evaluation of the contribution of education and other factors of productivity (seniority, experience, etc.) to the explanation of the gender gap in the labor market, it does not measure the contribution of fertility itself to this differential.5 One author who has explicitly modeled the influence of fertility on gender differences in the labor market is Waldfogel (1998). In addition to the concept of "gender gap", this author introduced the term "family gap" to refer to wage differences in the labor market due to "family responsibilities". She shows that while men in the US enjoy a sort of "family life bonus" by seeing their pay rise when they are married, women observe a kind of penalty due to marriage and procreation. The narrowing of gender differences in the labor market may ultimately be explained more by the convergence of the wages of fertility burden-free women with men's wages, while women with young children remain underpaid in the American labor market.

While economic approaches often seek to rigorously identify the underlying factors of inequalities between men and women in the labor market and to provide a utilitarian interpretation, "feminist" approaches attempt to produce a broader explanation by considering the origins of inequalities between men and women as a by-product of the organization and running of society as a whole. They present male domination as a historical premise. Gender inequalities in the labor market constitute discrimination driven specifically by the subordinate position of women in society, a position which is historically and culturally constructed. "By considering women's history as a special case of the general history of the forms of domination, the authors (feminists) consider the gender division of labor as the origin of this domination, legitimated by the naturalization of the differences and the relationships between the sexes" (Bourdieu and Passeron, 1990, cited by Locoh and Tichit, 1996). These differences are perpetuated and reproduced by a process of differential socialization according to a universal feature of human behavior, namely the tendency to imitate or copy specific gender role models: girls copy women, boys mimic men (Collier, 1994). Thus, by occupying positions of power (boss, business manager, etc.) on the different segments of the labor market, men manage to keep women at a disadvantage.

[5] Indeed, when fertility is not explicitly considered as an explanatory variable in gender differences, it is included in the error term with all the other omitted variables. It then becomes a simple nuisance parameter whose effect is to be neutralized.

Lastly, the body of literature presented above suggests that inequalities between men and women are due either to differences in human capital endowments or, in the case of identical endowments, to differences in returns. In both cases and in line with feminist theories, these inequalities can be viewed as discrimination against women, who are relegated to family chores, especially when society does nothing to better distribute the burden of chores among men and women. The purpose of this study is to reevaluate these assertions in Cameroon, Mali and Senegal.

4- Methodology

4.1 Choice of data used

The requirement of this study is that data should both information on employment, education and fertility. The only existing database to fulfill all three criteria is the Demographic and Health Survey (DHS). The DHS is funded by USAID and is implemented in many countries of the world, especially in developing countries, with the technical assistance of an American office called ICF Macro. We draw on the two most recent sets of DHS data available for each country.

These surveys collect information on the household characteristics, fertility data and socio-demographic variables (including education, employment, etc.) of women aged 15 to 49. In addition, in half or a third of households, depending on the country, men aged 15 to 59 years were interviewed regarding a subset of the modules put to the women, including questions on their procreation and economic activities.

Table 2: Presentation of DHS data used in this study

	Cameroon		Mali		Senegal	
Survey year	1998	2004	2001	2006	1997	2005
Number of interviewed households	**4,697**	**10,462**	**12,331**	**12,998**	**4,772**	**7,212**
Number of eligible women(15 to 49)	**5,501**	**1,656**	**12,849**	**14,583**	**8,593**	**14,602**
Number of eligible men (15 to 59 years)	**2,562**	**5,280**	**3,405**	**4345**	**4,306 (b)**	**3761**

(b) Men aged 20 years or more instead of 15 to 59 as elsewhere.

4.2 The variables and indicators

4.2.1 Indicator of high job status

Although employment indicators are not the main aim of the DHS surveys, they do contain questions on the occupational status of the women and men in the samples. Although no questions are put on earnings and income, the detailed record of occupations can be used to reconstruct the socioeconomic rankings. The interviews record workers' occupations in detail and then group them into socioeconomic categories before encoding. Seven socioeconomic categories are encoded6: scientific, technical and managerial occupations; intermediate administrative jobs; sales and services; low-skilled work; unskilled manual work; domestic work; and agriculture (self-employed or employee). In this study, the first two categories are grouped together in a category called "high job position", "high-class jobs" or "top jobs". This is an indicator of the extent of labor market integration.

4.2.2 Explanatory and control variables

DHS surveys have detailed modules on fertility, maternal and child health, the use of contraceptive methods, and fertility preferences. We use these modules to compute our fertility indicator (namely the number of children at the survey date) and the infertility indicator that serves as an instrument. We will say more on the second indicator later. Another module is used to measure the education indicators (literacy, years of completed education, etc.). The files also contain many other variables that can serve as controls: type of place of residence, religion, marital status, household living conditions, etc.

4.3 Methods of analysis

4.3.1 The issue of endogeneity

When we analyze the links between the labor market, human capital and human reproduction, potential endogeneity is a key question. Endogeneity could be generated by the extent of labor market integration and fertility choices (level and timing) being jointly determined, especially for women (Becker, 1991). Even

[6] In the recent EDS, there is a more detailed classification on two positions in addition to the classification into seven groups

education itself could be endogenous due to unobserved heterogeneity (Kuépié et al., 2009) or measurement errors. So the potential impact of an endogeinety bias on our estimates needs to be carefully examined.

Let Yi be an indicator of high job status in the labor market; Xi the vector of exogenous explanatory variables (religion, place of residence, age of the individual, marital status); ni the number of children and si the level of education. For every woman i, the link between high job status and the explanatory variables can be modeled by the equation:

$$Y_i = X_i\beta + \theta n_i + \gamma s_i + \mu i \qquad (1)$$

With u_i the error term

Discussion of the endogeneity of the number of children

The number of children partly reflects women's preferences and can therefore be correlated with the error term u_i. To correct this bias, let's consider a second equation:

$$n_i = Z_i\delta + v_i \qquad (2)$$

Where Z is a vector of explanatory variables X $\subset$ Z and (u, v) is potentially correlated because of the same unobserved preferences. Vector Z has to include variables that can be used as instruments; i.e. variables that determine a woman's level of fertility, but are completely exogenous to her labor market status. Two main types of instruments are generally used in the literature: the gender composition of the first children (Moschion, 2011, Angrist & Evans, 1998, etc.) and twin births (Rosenzweig et al., 1980, Rosenzweig et al., 2009, Cáceres-Delpiano, 2008). Although these two identification strategies can produce valid estimates under certain circumstances, they each have their disadvantages which can make them inefficient in our context. Gender composition of the first children is weakly correlated with fertility level in sub-Saharan Africa (Filmer et al., 2009, Kuepie & Tenikue, 2012), contrary to that which is observed in other parts of the world. A reason for this low correlation is the high level of fertility in sub-Saharan Africa. So most parents end up with children of both sexes without needing to upwardly adjust the optimal number of

their offspring. In this context, the gender composition of the first children is a weak instrument whose use can lead to unreliable estimates (Stock et al., 2002). The use of twin births as an instrument comes up against its scarcity, since less than two births out of a hundred are twin births. So most of the studies that use this instrument draw either on large databases from censuses and population registers (Angrist et al.,1998); Rosenbloom et al., 1999, etc.), or specific surveys in which families with twins are overrepresented (Rosenzweig et al., 2009), or stacked data from surveys conducted using similar methodologies in different countries or at different times (Kuepie and Tenikue, 2012). However, this study covers just three countries and two surveys per country. Besides, we are most interested in the differences between the countries themselves, and hence cannot stack the data in one database. We therefore address the issue of an endogeneity bias using a new instrument that has recently appeared in the literature: infertility. Agüero and Marks (2008, 2011) show in their papers on the female labor supply in developing countries that natural infertility or under-fertility can be used as a valid instrument for fertility.

The underlying idea is that potential differences in women's fertility may be due in large part to biological and physiological characteristics at birth and could therefore be exogenous. However, we shall consider that even if there are natural procreation differences among women, part of the declared infertility may theoretically result from behavior (sexually transmitted diseases and nutrition), which may be endogenous to the observed fertility. Yet Agüero and Marks (2008, 2011) show that this behavior actually only determines marginal procreation difficulties reported by women. A decisive advantage in using infertility as an instrument is that, unlike the composition by gender of the first children and twin births that occur at a specific point in the process of offspring accumulation, infertility can be considered as a permanent phenomenon (threat) during the reproductive life cycle of women. As a result, infertility identifies a sort of global average effect of fertility as opposed to the local average effect identified by instruments such as twin births and gender composition of first births.

Endogeneity of education

Education could also be potentially endogenous to labor market integration due to unobserved ability being positively correlated with the individual's level of education and job status in the labor market. Not controlling for this bias could lead

to the misestimation of the impact of education on labor market integration (Kuepie et al., 2009, etc.).To diagnose and treat this endogeneity, it is essential to have good instruments, as with fertility. In the literature, the authors use various instrumental variable strategies (parents' education, exogenous supply of education, etc.). In this study, we have none of these variables and therefore we cannot really diagnose the education endogeneity bias. Yet any endogeneity bias would be less of a nuisance in a comparative analysis such as ours. Indeed, based on the assumption that the unobserved ability bias is more or less the same among men and women,7 a comparison of the impact of gender differences due to education is quite valid even without controlling for endogeneity bias.8

5. Results

This section is organized into three sections. We start by presenting the parameters of the distributions of the key variables (dependent variable, main explanatory variables and instruments). We then estimate the equations of the first steps and the endogeneity tests of women's fertility. The results are then used to discuss the final choice of estimation method: IV or OLS. Thirdly, we model the differences in integration between men and women using regression models and Oaxaca and Blinder's decomposition methods. In each case, we pay special attention to the effects of human capital and the fertility burden in the explanation of the differences. Lastly, we interact fertility and education to highlight the heterogeneity of returns to education.

5.1 Descriptive statistics

Access to high job status

Access to high job status, i.e. scientific, technical, managerial occupations and administrative management jobs, is reserved for a very small minority of individuals. Indeed, across all three countries, only 12% of men on average aged 25-49 have access to this status, while only 3% of women are concerned. Depending on the

[7] There is no objective reason why unobserved heterogeneity should act radically different on men and women.

[8] Let βH and βF be the impact of education on men and women respectively and bH and bF their OLS estimates, which are assumed to be biased. The estimated difference bH - bF or bH/bF ratio, will be less biased if the biases are of the same sign and comparable size.

country, these rates vary from 7% of men in Mali to 16% in Senegal and from 2% to 4% in the same countries for females. People who get this type of employment can therefore be considered as part of a privileged elite. Obviously, access to this privilege is more limited among women. The analysis in this study helps evaluate the role of the fertility burden and human capital endowments in the explanation of these differences.

Fertility burden

The fertility burden is measured by the number of children each individual has at the time of the survey. This number is about 4 for women aged 25 to 49 years and approximately 3 for men of the same age group. Unlike total fertility presented in the background part of this document, the number of children is lower because most of the individuals considered have not yet come to the end of their reproductive life.

Education

The level of education is about 7 years for men and 4 for women. Cameroonian men and women are distinct from their congeners of both Sahelian countries with levels of education 2 and 3 years longer respectively than overall figures. Senegalese men have fourth year of primary school level and Malian men have third year of primary school level, with women respectively attaining two grades below. However, it should be noted that these data are merely averages driven down by the proportion of those without any schooling.9

Infertility

Five percent of women report childbearing problems. The highest proportion (6.5%) is observed in Cameroon, compared to about 4% in both Sahelian countries. The higher prevalence of fertility problems in Cameroon is also highlighted by some specific studies on this subject (Evina, 1989).

[9] This is the case for about 26% of men and 47% of women in all three countries.

Table 3. Descriptive statistics on the variables used in the study

	Overall		Cameroon		Mali		Senegal	
	Male	Female	Male	Female	Male	Female	Male	Female
High status job	0.119	0.030	0.116	0.030	0.072	0.019	0.159	0.043
	(0.324)	(0.172)	(0.321)	(0.170)	(0.259)	(0.135)	(0.366)	(0.202)
Infertile	-	0.048	-	0.065	-	0.044	-	0.038
		(0.214)		(0.246)		(0.206)		(0.191)
Number of children	3.003	4.268	3.010	3.854	3.372	4.704	2.401	4.188
	(3.146)	(2.789)	(3.207)	(2.704)	(3.082)	(2.809)	(3.002)	(2.781)
Years of education	6.747	4.124	9.018	7.056	4.441	2.515	5.816	3.237
	(5.580)	(5.572)	(4.373)	(4.355)	(6.345)	(6.606)	(5.222)	(4.278)
Muslim	0.468	0.600	0.158	0.164	0.960	0.959	0.456	0.613
	(0.499)	(0.490)	(0.365)	(0.370)	(0.197)	(0.197)	(0.498)	(0.487)
Christian	0.310	0.253	0.727	0.775	0.028	0.025	0.031	0.038
	(0.463)	(0.435)	(0.445)	(0.418)	(0.166)	(0.156)	(0.172)	(0.190)
Other religion	0.210	0.142	0.089	0.051	0.005	0.009	0.514	0.349
	(0.408)	(0.349)	(0.285)	(0.220)	(0.070)	(0.096)	(0.500)	(0.477)
Age	35.208	34.582	34.646	34.198	35.775	34.335	35.441	35.149
	(7.019)	(6.884)	(7.014)	(6.820)	(6.658)	(6.934)	(7.248)	(6.854)
	0.197	0.038	0.181	0.070	0.114	0.023	0.282	0.027
	(0.398)	(0.192)	(0.385)	(0.255)	(0.318)	(0.151)	(0.450)	(0.162)
Married	0.733	0.848	0.711	0.777	0.851	0.904	0.667	0.854
	(0.443)	(0.359)	(0.454)	(0.416)	(0.356)	(0.295)	(0.471)	(0.353)
Widow	0.001	0.036	0.002	0.052	0.001	0.032	0.001	0.026
	(0.032)	(0.185)	(0.040)	(0.222)	(0.028)	(0.175)	(0.025)	(0.158)
Divorcee	0.069	0.077	0.107	0.101	0.033	0.041	0.051	0.093
	(0.253)	(0.267)	(0.309)	(0.301)	(0.179)	(0.198)	(0.219)	(0.291)
Not given Marital status	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
	(0.015)	(0.000)	(0.000)	(0.000)	(0.028)	(0.000)	(0.000)	(0.000)
Brought up in a big town	0.196	0.210	0.222	0.230	0.202	0.199	0.165	0.203
	(0.397)	(0.407)	(0.416)	(0.421)	(0.402)	(0.399)	(0.371)	(0.402)
Brought up in a middle town	0.157	0.174	0.063	0.085	0.123	0.159	0.288	0.262
	(0.364)	(0.379)	(0.244)	(0.279)	(0.329)	(0.366)	(0.453)	(0.440)
Brought up in a small town	0.220	0.249	0.239	0.284	0.233	0.236	0.184	0.234
	(0.414)	(0.433)	(0.427)	(0.451)	(0.423)	(0.424)	(0.388)	(0.424)
Brought up in a rural area	0.411	0.350	0.469	0.398	0.439	0.399	0.319	0.261
	(0.492)	(0.477)	(0.499)	(0.490)	(0.497)	(0.490)	(0.466)	(0.439)
Brought up abroad	0.016	0.017	0.006	0.003	0.002	0.006	0.045	0.039
	(0.125)	(0.130)	(0.079)	(0.056)	(0.049)	(0.079)	(0.207)	(0.194)
Lives in city	0.400	0.335	0.467	0.420	0.403	0.346	0.318	0.251
	(0.490)	(0.472)	(0.499)	(0.494)	(0.491)	(0.476)	(0.466)	(0.434)
Lives other urban area	0.242	0.286	0.092	0.098	0.323	0.334	0.357	0.398
	(0.428)	(0.452)	(0.289)	(0.297)	(0.468)	(0.472)	(0.479)	(0.489)
Lives in rural area	0.358	0.379	0.441	0.483	0.273	0.320	0.325	0.351
	(0.479)	(0.485)	(0.497)	(0.500)	(0.446)	(0.466)	(0.468)	(0.477)

Standard deviation in parentheses

5.2 Addressing the issue of fertility endogeneity

As mentioned in the methodological part of this document, we address the endogeneity issue based on childbearing problems reported by women as a source of exogenous variation in fertility. The objective here is to analyze the validity of this instrument. An instrument is valid if it fulfills two conditions. Firstly, it must be correlated with the variable to be instrumented. Secondly, it must be non-correlated with the error of the main equation, that is, in our case, with the unobservable from the equation of holding top job status in the labor market. Although the first condition is directly testable, the second is only indirectly testable.

5.2.1 Relationship between childbearing problems and level of fertility

Table 4 shows that childbearing problems declared by women are a good predictor of their fertility level, other things being equal. Across all the countries, women with childbearing problems have significantly fewer children than others. The impact of infertility is strongest in Cameroon, since women with childbearing problems have an average 1.7 fewer children than those without fertility problems. Senegal is in second position with infertility reducing female fertility by about 1.4 children. In Mali, the gap between women with no fertility problems and women with childbearing problems is only 0.7 of a child, but it remains highly significant (the student “t” statistic is 3 in Mali, against 9 in Cameroon and 6 in Senegal).

Table 4. Impact of procreation problems on the parity achieved by women aged 25 to 49 years in urban Cameroon, Mali and Senegal (OLS method)

VARIABLES	Cameroon	Mali	Senegal
Infertile	-1.659***	-0.760***	-1.367***
	(0.180)	(0.217)	(0.235)
Years of education	-0.134***	-0.045***	-0.114***
	(0.009)	(0.008)	(0.007)
Marital status (ref=single)			
In union	1.749***	2.169***	1.701***
	(0.092)	(0.135)	(0.136)
Widow/er	1.498***	1.770***	1.450***
	(0.194)	(0.267)	(0.260)
Divorcee	0.763***	0.411**	0.159
	(0.131)	(0.202)	(0.161)
Religion (ref=Muslim)			
Christian	-0.152	-0.435**	-0.568***
	(0.117)	(0.185)	(0.133)
Other_religion	-0.044	0.305	-0.291
	(0.186)	(0.330)	(0.879)
Age	0.187***	0.206***	0.218***
	(0.006)	(0.006)	(0.005)
Environment of residence during Childhood (ref=capital, big town)			
Middle-sized town	0.095	0.291**	0.118
	(0.129)	(0.132)	(0.105)
Big town	0.133	0.115	0.100
	(0.094)	(0.113)	(0.105)
Rural	0.159*	0.477***	0.486***
	(0.091)	(0.104)	(0.106)
Foreigner	-0.428	0.436	0.341**
	(0.430)	(0.449)	(0.173)
Current environment of residence (ref=capital, big town)			
Middle-sized town	0.483***	0.489***	0.034
	(0.130)	(0.096)	(0.093)
Rural	0.362***	0.566***	0.138
	(0.077)	(0.093)	(0.095)
Constant	-2.964***	-4.642***	-4.177***
	(0.227)	(0.209)	(0.909)
Observations	4,076	4,741	4,834
R-squared	0.390	0.340	0.404

Robust standard errors in parentheses, controlled for survey round fixed effects
*** p<0.01, ** p<0.05, * p<0.1

Once it has been established that fertility problems are an important determinant of observed fertility level, we need to discuss the exogeneity of this instrument.

It is quite impossible to formally test the exogeneity of an instrument, in other words, to show that it is not correlated with the error term of the equation of interest. An explanatory variable where one cannot define a direct causal link with the dependent variable is potentially a good instrument. This is the case with our infertility variable because we can reasonably argue that, if this variable has any influence on access to a good labor market position, it is through its impact on the level of female fertility. Aïguro and Marks10 (2008, 2011) extensively discuss the issue of the exogeneity of the infertility declared by women. They conduct a certain number of correlation tests between infertility and the observable characteristics of women and come to the conclusion that a large part of infertility is not empirically correlated to these characteristics and is therefore likely to be biological. Joffe & Barne (2000) and Field & Ambrus (2008) come to the same conclusion. These latter authors review a certain number of biomedical studies on irregular menstruation and conclude that they are not actually related to poverty or malnutrition.11 So female infertility can be considered as a result of chance at birth.

5.2.2 Endogeneity test for fertility

We have already shown that the fertility burden is closely linked to infertility. The literature suggests that this infertility is not correlated with unobservables that could tie in with the women's position in the labor market. Infertility can be considered to be a valid instrument for the rest of our analysis. Once we have shown that our instrument is likely to be valid, the assumption that fertility is actually endogenous needs to be formally tested. Even if the instruments are valid, the use of IV instead of OLS is recommended only if the suspected variable is actually endogenous, because IV has the disadvantage of providing consistent estimates that are biased in finite distance and it is less efficient than OLS if endogeneity is not

[10] Who use the same instrument strategy as us in their study on the female labor supply in developing countries.

[11] Hunger and poverty can naturally affect menstruation and hence fertility. Yet this is found only in extreme cases, which are not taken into consideration by conventional studies.

effective. Under the assumption that the instruments are valid, one of the ways to test for endogeneity is to introduce the residuals from the instrumentation equation into the equation of interest. We use this procedure and record the results in Table 5.

It is clear from this table that, irrespective of the country, the exogeneity of fertility cannot be rejected in the equation of women's high occupational status in the urban labor market. In other words, using OLS to estimate the determinants of this status is quite valid.

Using IV would produce less efficient estimators. The Senegalese case illustrates this inefficiency of IV estimators because, although OLS and IV produce identical estimates of the impact of fertility on holding a high job status, the IV estimator's standard error is multiplied by 10, resulting in the loss of statistical significance (see Table 5). In the other two countries, the estimates of the two methods are nominally different, but the IV estimators' standard error is so large that their confidence interval also contains the OLS estimators.

Table 5. OLS and IV coefficients of the impacts of education and family size on women being in the top job segment of the labor market in Cameroon, Mali and Senegal; and test of the fertility exogeneity parameters.

	Cameroon		Mali		Senegal	
VARIABLES	OLS	IV	OLS	IV	OLS	IV
Number of children	0.001	0.008	-0.003***	0.003	-0.005***	-0.005
	(0.001)	(0.006)	(0.001)	(0.013)	(0.001)	(0.010)
Years of education	0.014***	0.015***	0.003***	0.004***	0.020***	0.020***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Constant	-0.155***	-0.134***	-0.012	0.025	-0.165***	-0.197***
	(0.022)	(0.025)	(0.021)	(0.067)	(0.034)	(0.054)
Observations	4,076	4,076	4,754	4,754	4,688	4,688
R-squared	0.094	0.083	0.044	0.033	0.182	0.182
Hausman test statistic for exogeneity		**2.296**		**0.235**		**0.00109**
P-value of the statistics		**0.130**		**0.628**		**0.974**

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
The same control variables as in Table 4 and 6 are used

Lastly, the exogeneity tests do not allow for the conclusion that fertility is endogenous in the high job status equation. So we have to base our analysis on the OLS estimators.

5.3. The impact of human capital and the fertility burden on men and women in the high socioeconomic class

We run the same models for men and women. In addition to family size and level of education, we introduce the following control variables into the models: age, marital status, area of residence (capital city, medium-sized city or rural area), area of residence during childhood (capital, medium-sized city, small town or rural area) and religion. The objective of including these variables is to reduce the share of unobservables that could be correlated with the two main explanatory variables. However, we will not focus on the interpretation of the effects of these control variables.

5.3.1 Asymmetry effect of family size on men and women's job status

In all countries, the number of offspring is an obstacle to women's integration into the high job segment of the labor market. Each additional child reduces their chances by about a half of a percentage point, which is not inconsiderable given that each woman has an average of 4 children and that top jobs are rationed, concerning only 3% of women. Unlike the women, the impact of offspring on men's chances of gaining top jobs is almost zero.

Considering the countries separately, Senegal and Mali are in keeping with the overall model of fertility having a damaging effect on women's access to top jobs and no impact on men. This gender asymmetry of the family size impact is in phase with earlier studies on this question (Frenette, 2010, Angrist & Evans, 1998, and Moschion, 2011, for example). The negative impact observed for women can be interpreted as a kind of penalty due to the burden of procreation, which reduces the investment in women's human capital (in terms of training, experience and seniority,12 for example) and therefore their opportunities for professional mobility. Men, on the other hand, are not affected because they participate very little in the fertility burden. In Cameroon, however, procreation does not appear to be an obstacle to women's careers. It should be noted that the background section presents

[12] Given that education is already controlled for.

Cameroon as having the least gender inequality of the three countries. The descriptive analysis also finds that Cameroonian women are educationally significantly better off than women in the other two countries. The fact that they are not hampered in access to top posts by the burden of their fertility could be due to their better relative position in society. Cameroon also differs from the two Sahelian countries in terms of children having a positive effect on the man's job status. This result cannot be interpreted in terms of causality, but may rather reflect a positive correlation between men's socioeconomic status and the size of their family in Cameroon, as also pointed out by some authors (Wakam, 1994).

5.3.2 Positive effect of education on female access to top job status, albeit lower than men's

Unlike fertility whose effects on high job segment access differ by gender, education positively affects men and women's employment prospects, albeit to differing extents.

For women, one year of additional education increases the likelihood of access to a high quality job by about 1%. One year of additional education has twice that effect (2%) on men. Therefore, this finding reveals the greater efficiency of human capital for men. Given that educational capital is scarcer among women, we might have expected the opposite. The fact that this is not the case could be a symptom of more restrictive barriers for women at the door to the top sector of the labor market. Some authors (Nordman and Wolff 2009) use the concept of "glass ceiling" to refer to the problems women have accessing certain top positions in companies and administrations. The lower efficiency of education observed here could be the manifestation of such a glass ceiling in the sub-Saharan African context.

In general, we observe the same configuration in each of the three countries, i.e. a positive effect of education on access to top jobs regardless of gender, but to a lesser extent for women. Behind this general picture, note that the gap in the effect of education between men and women is 1 to 4 in Mali and1 to 2 in Cameroon and Senegal. This result seems to suggest that the "glass ceiling" is more airtight in Mali than in Senegal and Cameroon. It is also consistent with the fact that Mali has the

greatest inequalities between men and women, as presented in the background section.

Table 6. Determinants of men and women's access to the higher labor market segment from 25 to 49 years (OLS estimates).

	Overall		Cameroon		Mali		Senegal	
VARIABLES	Female	Males	Female	Males	Female	Males	Female	Males
Number of children	-0.004***	0.000	0.000	0.011**	-0.003***	-0.004	-0.005***	0.000
	(0.001)	(0.002)	(0.001)	(0.005)	(0.001)	(0.003)	(0.001)	(0.005)
Years of education	0.009***	0.023***	0.014***	0.035***	0.003***	0.014***	0.020***	0.039***
	(0.001)	(0.003)	(0.001)	(0.004)	(0.001)	(0.003)	(0.001)	(0.003)
Marital status (ref=single)								
In union	0.034***	0.065***	0.035***	0.063**	-0.005	0.048**	0.078***	0.061*
	(0.008)	(0.016)	(0.011)	(0.029)	(0.018)	(0.020)	(0.017)	(0.032)
Widow/er	0.023**	-0.017	0.035**	-0.078	-0.016	-0.022	0.064***	0.091**
	(0.011)	(0.023)	(0.014)	(0.048)	(0.020)	(0.026)	(0.022)	(0.037)
Divorcee	0.038***	0.020	0.047***	0.031	0.008	-0.030	0.058***	0.045
	(0.010)	(0.027)	(0.014)	(0.045)	(0.022)	(0.028)	(0.019)	(0.057)
Religion (ref=Muslim)								
Christian	-0.005	0.005	-0.043***	-0.062*	0.008	0.025	0.027	0.004
	(0.007)	(0.026)	(0.007)	(0.034)	(0.016)	(0.053)	(0.021)	(0.060)
Other_religion	-0.017**	-0.053	-0.048***	-0.106**	-0.017***	-0.103***	-0.034	0.044
	(0.008)	(0.040)	(0.010)	(0.051)	(0.003)	(0.035)	(0.023)	(0.126)
Age	0.002***	0.005***	0.003***	0.007***	0.001***	0.002	0.003***	0.007***
	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)	(0.001)	(0.000)	(0.002)
Environment of residence during Childhood (ref=capital, big town)								
Middle-sized town	0.009	0.010	0.023*	-0.061	-0.002	0.018	0.011	0.031
	(0.006)	(0.023)	(0.014)	(0.042)	(0.009)	(0.026)	(0.010)	(0.050)
Big town	0.000	0.022	-0.004	0.010	0.003	0.039	0.011	0.039
	(0.006)	(0.021)	(0.008)	(0.037)	(0.009)	(0.027)	(0.010)	(0.057)
Rural	0.002	0.024	0.009	0.001	-0.010	0.028	0.025***	0.048
	(0.005)	(0.018)	(0.008)	(0.034)	(0.007)	(0.022)	(0.009)	(0.046)
Foreigner	0.001	-0.082**	0.048	-0.346***	-0.019***	-0.040	0.017	-0.020
	(0.011)	(0.041)	(0.067)	(0.089)	(0.007)	(0.052)	(0.014)	(0.061)
Current environment of residence (ref=capital, big town)								
Middle-sized town	-0.010**	0.020	-0.000	0.022	-0.009	0.012	-0.009	0.011
	(0.005)	(0.016)	(0.008)	(0.035)	(0.006)	(0.019)	(0.009)	(0.037)
Rural	-0.002	0.029*	0.003	0.004	0.003	0.042*	0.001	0.025
	(0.004)	(0.016)	(0.006)	(0.030)	(0.006)	(0.021)	(0.009)	(0.040)
Constant	-0.105***	-0.320***	-0.155***	-0.478***	-0.012	-0.155***	-0.146***	-0.377***
	(0.015)	(0.047)	(0.022)	(0.087)	(0.021)	(0.045)	(0.032)	(0.073)
Observations	13,651	2,635	4,076	631	4,741	1,236	4,834	768
R-squared	0.083	0.199	0.094	0.244	0.044	0.155	0.179	0.279

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
Survey fixed effects are controlled for in the models

Oaxaca-Blinder decomposition of the differences between women and men in access to top jobs

We show above that the fertility burden and human capital have different impacts on top job status. The descriptive analysis of the key variables of interest also concludes that men and women have different profiles when it comes to these two

factors. Oaxaca and Blinder's method consolidates these results by decomposing the differences between male and female access to top jobs into two components: one due to gender differences in factor endowments (fertility burden and educational capital) and the other due to gender differences in the impacts of the factors.

The results of this decomposition are included in the Table 7. It shows that the difference between women and men in access to top jobs is 8.6% for all three countries overall. This gap is 9.7% in Cameroon, 5% in Mali and 13.7% in Senegal. Of the two main factors of interest, education contributes the most to explaining gender disparities in access to top jobs due to both differences in human capital endowments between men and women and differences in education efficiency by gender. Yet it is this latter component that accounts for the largest contribution: differences in the efficiency of education between men and women explain 5.9% of the differences in the three countries as a whole compared to just 1.5% for education level differences. These percentages are respectively 15.1% and 2.9% for Cameroon, 2.7% and 0.7% for Mali and 6.2% and 4.5% for Senegal. In Cameroon and Mali, most of the inequalities in access to top jobs are due to discrimination against women, since the differences in educational capital endowments represent less than one-third (one-fifth in Cameroon and one-quarter in Mali) of the differences in education efficiency. In Senegal, the weights of the two components are more balanced.

The net contribution of the number of children to differences between male and female access to top jobs is smaller and less clear-cut. In Cameroon, it contributes to the explanation of gender disparities in terms of its differential impact on men and women. In Mali and Senegal, its effect strangely enough channels through the differences in fertility level between men and women.

Table 7. Oaxaca-Blinder decomposition of sources of disparities between men and women in access to top jobs

	Total	Cameroon	Mali	Senegal
Proportion of men in top jobs	0.117***	0.127***	0.072***	0.180***
	(0.006)	(0.013)	(0.007)	(0.014)
Proportion of women in top jobs	0.030***	0.030***	0.019***	0.042***
	(0.001)	(0.003)	(0.002)	(0.003)
Difference	0.086***	0.097***	0.053***	0.137***
	(0.006)	(0.014)	(0.008)	(0.014)
Decomposition of differences due to human capital and fertility				
Difference due to fertility level	0.005***	-0.000	0.004***	0.009***
	(0.001)	(0.001)	(0.001)	(0.002)
Difference due to fertility coefficients	0.019*	0.043**	-0.005	0.022
	(0.011)	(0.021)	(0.014)	(0.023)
Difference due to interaction	-0.006*	-0.009*	0.001	-0.009
	(0.003)	(0.005)	(0.004)	(0.010)
Difference due to level of education	0.015***	0.029***	0.007***	0.045***
	(0.002)	(0.004)	(0.002)	(0.005)
Difference due to education coefficients	0.059***	0.151***	0.027***	0.062***
	(0.015)	(0.027)	(0.009)	(0.010)
Difference due to interaction	0.025***	0.045***	0.021***	0.044***
	(0.007)	(0.009)	(0.007)	(0.008)
Observations	16,286	4,707	5,977	5,602

Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

5.3.3 Interaction between education and fertility

In the previous analysis, we assume that fertility and education act separately, i.e. the marginal return of one year of education does not depend on the fertility level and vice-versa. In this section, we relax this hypothesis by running a model with interaction terms of education x fertility. Our estimates show that, in many cases, the interaction terms between the two variables are zero. That is especially the case for women in Cameroon and in Senegal, where an additional child lowers the marginal efficiency of education by 0.1 and 0.2 percentage points respectively. In these countries and with the same number of years of education, women with fewer children are more successful in the labor market.

Table 8. Interaction between education and fertility on labor market top job status

VARIABLES	(1) Feme_OLS-CM	(2) Home_OLS-CM	(3) Feme_OLS-ML	(4) Home_OLS-ML	(5) Feme_OLS-SN	(6) Home_OLS-SN
Number of children	0.004**	-0.020***	-0.003***	-0.006**	-0.000	-0.004
	(0.001)	(0.006)	(0.001)	(0.003)	(0.001)	(0.005)
Years of education	0.016***	0.022***	0.004***	0.012***	0.026***	0.036***
	(0.002)	(0.004)	(0.001)	(0.005)	(0.002)	(0.004)
Number of children X Years of education	-0.001**	0.004***	-0.000	0.001	-0.002***	0.001
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.001)
Constant	-0.183***	-0.291***	-0.015	-0.142***	-0.192***	-0.343***
	(0.025)	(0.093)	(0.021)	(0.045)	(0.035)	(0.075)
Observations	4,076	631	4,741	1,236	4,834	768
R-squared	0.096	0.280	0.045	0.157	0.188	0.281

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The same control variables are used as in Table 6

Conclusion

This study set out to measure the impact of human capital and the fertility burden on labor market inequalities between men and women, in particular as regards access to the most highly paid jobs. The study covers Cameroon, Mali and Senegal, three countries in sub-Saharan Africa with similar socioeconomic characteristics (high fertility, young population, low level of human capital, labor market largely dominated by poor quality jobs, high prevalence of poverty, etc.). The economic literature suggests that the lower place of women in the labor market is due either to a human capital endowment differential or to different returns to education. The latter case refers to female discrimination in the labor market. The sociological approach provides a better understanding of this discrimination by showing that it is due to the separation of roles in society: if women are assigned essentially the "reproductive" role, they accumulate less human capital and are steered towards jobs provide a better work-life balance. Yet few economic studies on inequalities between women and men in the labor market have explicitly considered the burden of reproduction alongside human capital inequalities.

In this study, we adopt the dual economic and sociological approach and find that the huge inequalities that exist in access to top jobs are due to both differences in access to human capital and the fertility burden. To test this hypothesis, we use data from demographic and health surveys (DHS) carried out in the three countries between 1995 and 2006. Although these surveys were not designed to measure labor market indicators, they contain questions that can be used to reconstruct the socioeconomic categories and therefore to identify the top job segment. Human capital is also suitably covered by questions on education and literacy. The advantage of DHS data is that they contain modules on childbearing history and reproductive health, detailing the number of children by men and women and a measurement of female infertility. At the econometric level, we show that the exogeneity of fertility cannot be rejected and that the ordinary least square methods produce the most efficient estimators.

The results of our analyses show that, irrespective of the country, women have three handicaps that explain why they are thin on the ground in the higher segment of the labor market. The first, and most obvious, is that they generally have a low level of education, which automatically reduces their likelihood of access to the top job segment. Yet even those with the same level of education as men still stand less of a chance of getting a top job because education is less efficient for them. This finding provides evidence of gender discrimination in all three countries. Lastly, a fertility burden in terms of a large family is another obstacle to female access to the most highly paid jobs sector. The negative impact of this factor is direct in the two Sahelian countries (Mali and Senegal) and indirect in Cameroon. A last result is that women's education efficiency varies with family size in Cameroon and Senegal. The more children a woman has, the lower her marginal return to education.

These findings combine to show that a woman's labor market situation improves in all three countries when fertility declines, either directly through greater access to top jobs or indirectly via better human capital efficiency.

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