SPECIALISED MASTER IN INTERNATIONAL AND DEVELOPMENT ECONOMICS

Strategic fertility in the Muslim community in Cameroon

Atsagmo, Sidonie

Award date:
2020

Awarding institution:
University of Namur

Strategic fertility in the Muslim community in Cameroon

Thesis presented by
Sidonie ATSAGMO

Supervisor
David de la Croix (UCL)

Tutor
Marie SELECK (UNamur)

Academic year 2019-20

Project presented as part of the requirements for the award of the Specialized Master in International and Development Economics Jointly organized by the ESLN and the ESL

Département des Sciences économiques/UNamur • Rempart de la Vierge 8 • 5000 Namur
Ecole d'économie de Louvain/UCL • Place Montesquieu 3 • 1348 Louvain-la-Neuve

Abstract

The purpose of this work is to determine what motivates Muslims to make more children. To do this, this study builds a variable that assigns to each woman in the sample the share of her religious group in the area of residence. One woman's fertility here is measured by the number of children already made. A key variable for this study is the parents' bargaining power, which for a given parent, measures the proportion of their religion in their region of residence. Our empirical study initially takes two samples, one at the national level and the other for the Muslim group only. The regressions are done using the method of the Least Ordinary Square. The results of our analyses show that in Cameroon fertility was higher in the Muslim community in 2005. In addition, from the observable variables, we found that the key factors driving this group to high fertility are : minority status, mortality rate and rural residence. Moreover, we found that low educational attainment and low participation in the labour force of Muslim women are obstacles to reducing their fertility.

Keywords : Fertility, parents' bargaining power, Muslim group, minority status.

1 Introduction

During the last two decades, the search for development in the world has occupied a large place in economic and political debates. However, to hope for a possible development, several problems must be solved ; we can mention among others the problems of low level of education, high fertility and cultural diversity. These issues differ across continents, countries and even regions. Education, fertility and ethnicity have causal links ; in the less developed countries, there is generally a low level of education, particularly that of women, high fertility and a diversity of ethnicities and / or religions. We note from the study by Joseph Alfred Grinblat (2008) that in 1950 fertility was equal or greater than six children per woman in developing regions, while in developed regions it was less than 3.5 children per woman.

Aware of this scourge, which has a negative impact on development, several programs have been put in place to lower the fertility of women. Through these programs, fertility declines were recorded between the 1970s and 1990s in almost all regions except Sub Saharian Africa and Eastern Europe. With the program of the United Nations Population Fund focusing on the status of women, defined by the Cairo Conference in 1994, some parts of Africa have been able to reduce their fertility between 1990 and 2005, but Central Africa has not changed over this period (Joseph Alfred Grinblat, 2008).

About education, it is strongly linked to the well-being of the population. Several studies have shown that the more we are educated, more we earn income and move away from poverty, which is a key factor in development. According to De La Croix and Doepke (2003), education and income influence fertility. When parents are wealthy and educated, they tend to reduce their fertility because raising children requires both income and time. Other studies show that this reduction in fertility is also due to the woman's first marriage age and her knowledge of modern contraceptives (Bongsuiru, 1993).

During the last centuries, the education of the girl was not a priority, especially in developing countries ; women were expected to marry and procreate. In some societies, the under-enrollment of girls was due to their belonging to a social group.

Indeed, when a society is divided into several ethnic groups, it may be confronted with ethnic conflicts, which can sometimes cause civil wars and make society unstable. A minority group in a society may therefore think that by raising fertility, it can increase its population and trigger war against another group to gain power (Bezin,Chabé-Ferret and De La Croix, 2018). But to have

effective institutions, we must invest in the education of women and children. Several studies show that educated women marry late and have fewer children than their uneducated women in all developing countries (Adamchak and Ntseane 1992, Bledsoe and al 1999, United Nations 1995) [1]. When a woman is more educated, her behaviour changes towards certain customs and traditions that negatively affect her well-being. This is because her education enables her to learn about modern practices that can help her improve her social situation and that of her offspring.

Whatever the period, the age of a woman's first marriage varies according to the level of education, countries, customs, religions, cultures etc... At the Cameroon level, data from 1979 show that the average age of women at first marriage was 15.6 years for illiterate people, 17 years for those at primary level and 19.5 years for those at secondary level and above. In the north, marriages were early for women, at puberty or before ; which had an impact on the sterility of these young women at the start of the marriage. During this period, among illiterate Cameroonian women, more than 50% were Muslim (Bongsuiru, 1993).

Indeed, in Cameroon Muslims is a minority group compared to the Catholic and the Protestant groups. In 1998, 64.1% Muslim women were uneducated, compared to 10.03% among Catholics and 24.97% among Protestants. According to the level of education, 78.2% of Muslim women were married compared to 42.8% among Catholics and 48.2% among Protestants (Johnson-Hanks,2003). She compares Beti women with Mandara women and finds that both groups have very diverse cultures. Her results show that Beti women have access to education and the labor market, unlike Mandara, where marriage seems to be compulsory for women and they have many children.

Although the enrollment rate has increased in the Muslim community in Cameroon, it is still low and the fertility rate is still very high compared to other religions. According to Sonzia (2015), approximately 80% of women in the north were uneducated, this rate dropped to 60% in 2011. While fertility is decreasing in several ethnic groups, it is almost increasing in this area due to the considerable non-use of contraceptives (they have a use rate of less than 10%).

In a country with many ethnic and / or religious groups, in a given region it is possible to determine the proportion of a group in order to judge whether there is a minority or not. In fact according to Bezin,Chabé-Ferret and De La Croix (2018), the status of a group (minority or not) varies from one region to another. It becomes important to see whether the fertility and

1. See Johnson-Hanks(2003)

educational attainment of this group varies by region as a function of its minority status.

Cameroon has ten regions and about 250 ethnic groups, (among others, the Bamilélé, the Douala, the Beti, the Mandara, etc ...) The Bamiléké are those from the Western region. For the constraints of work, education and investment they are present in all regions of Cameroon. In addition to ethnic groups, there are several religious groups in Cameroon. These include Christians (Catholics, Protestants, Orthodox), Muslims, Animists etc... Several studies tell us that the Muslim community is the most undereducated and the most fertile in the country. (e.g Sonzia 2012, 2015 ; Domo 2010, 2014 Johnson-Hanks 2003 and Bongsuiru, 1993).

According to some authors, the high fertility of minority groups is since the parents of these groups believe that a high number of children would increase their bargaining power in society. In a situation of inter-religious warfare, a minority group is less likely to face the war because it will have few soldiers and its population may decrease further after the war. It is therefore necessary to know the regions of Cameroon in which the Muslim group is a minority, then to study whether its size influences fertility and finally to find out whether there are other factors that positively affect fertility.

It then becomes necessary to know one's status (minority or not) in each region where it is present. However, existing literature shows us that the two most represented religions in Cameroon are : Christians and Muslim. These religious groups are present in all ten regions of the country. However, while the Muslim group is in the majority in the north and among the Bamouns in West Cameroon, it is rather a minority throughout the country.

Unlike the authors, we want to look at the minority character of the Muslim group in relation to the education of children and the fertility rate of their parents. This idea allows us to ask the following question : what are the key elements that may encourage Muslim parents to resort to high fertility ?

Indeed, it is important to know the different sources of high fertility in each group in order to define appropriate policies for that group to reduce its fertility.

To answer this question, we will focus our study on women aged 35-49. To test the influence of a group's minority status on its fertility, we will divide the population into the following groups : small minorities, minorities, medium-size and majorities ; this is done by first calculating the religious weights of parents in each region. Based on the existing literature, several other socioeconomic factors will be considered in the model in order to judge their impact on fertility.

Our study is made by comparing Muslim women to Cameroonian women as a whole, and our investigations show that fertility is higher in the Muslim group than at the national level, which corroborates with the work of Sonzia (2012), Johnson-Hanks (2003), and Domo (2010). Moreover, women in this religious group are the least educated. A surprising result of our study is that the effect of the level of education attained tends to disappear in the Muslim group. We also note that the number of children born to a woman is an decreasing function of her labour force participation. On the other hand, we find that in Cameroon, belonging to the minority group is an increasing function of the number of children born to a woman, which corroborates with the results of Bezin, Chabé-Ferret and De La Croix (2018)in Indonesia and Aisa et al (2014) in Spain.

Our work is organized as follows : Section 2 presents a brief review of the literature, Section 3 focuses on data and methodology, Section 4 presents the data analysis and Section 5 presents the conclusion.

2 Literature review

Generally, the investments of the parents in other sectors (leisure, trade, business and industry etc...) are reduced because of the education of the children. It is always said that parents' investment in education reduces their numbers of children on the one hand. On the other hand, minority groups tend to invest more in the number of children at the expense of education ; but a contrary result was found in the study of Bezin, Chabé-Ferret and De La Croix (2018) with the data of the Indonesia. These authors do both empirical and theoretical study and their results show that minority religious groups in Indonesia invest in both education and the quantity of children.

These authors believe that in the hope of having power, the high fertility of minority groups is encouraged. Some of the things that can motivate individuals to have more children, they noted from the economic literature : a higher opportunity cost for educated parents, a higher return to education of children, higher income and the possibility of inter-generational transfers, and changing gender-specific opportunities. They use the new approach "fertility as proof of belonging to a social group".

Aisa et al (2014), have worked on fertility patterns in the Roma population of Spain. Like the previous ones, they also made a study that was both theoretical and empirical. Their results

show the help of adult children in family production and the parents' bargaining power are key factors that encourage parents in this minority group to have high fertility. We note from this study that the effort made by adult children in family production is one of the causes of their non-education. Indeed, with the income received by their children, parents feel free of charges, therefore they will be motivated to have more children.

The bargaining power of the parents of a group here represents its weight in the total population. It would appear that minority groups have a low weight in society in terms of decision-making in a highly divided society. Mugny and al (1977) note in this regard that in a country the majority group is in power, it defines policies and the minority group is subject to them. According to Graham-Grown (1994), minorities may not gain access to power and government because they may be excluded from power. Thus, the parents' bargaining power would be strongly linked to majority or minority status.

In societies where human rights are not fully respected, it becomes difficult for minority groups to take power. According to Yuval-Davis (1996), in these types of societies, the power to appropriate resources of a religious or ethnic group depends on its weight. He puts forward the idea of people as power, in this sense minority groups are encouraged to have more children in order to increase their weight in society. In the same context, De La Croix and Dottori (2008) note that where there are increasing returns to the influence of people's weight on political power, each group is motivated to increase its population in order to hope for more power in the future.

In our study, a parent's bargaining power will be measured by the share of his or her religion in his or her area of residence. This power will allow us to distinguish parents from the majority and minority groups according to their share.

We note from Bezin, Chabé-Ferret and De La Croix (2018) study that in a country, the ethnic or religious diversity affects both its quality of governance, the cost of civil wars, and the competition among population groups ; and therefore the economic performance of country. In the same sense, we note from the study of René Otayek (2001), sociocultural pluralism would thus be incompatible with democracy, as an idea and mode of political regulation, and with political stability and development ; and can thus represent an obstacle for the democratization of African countries.

Bezin, Chabé-Ferret and De La Croix (2018) have worked on Indonesia, which is a country with more than about 700 languages and spoken dialects. At the level of Cameroon which

has about 250 ethnic groups and more than 800 spoken languages, Johnson-Hanks (2003) has worked on education, ethnicity and reproductive practices. In addition to the causal link between women's fertility and their education, his study considers the number of children born to a woman ; but without looking at the effect of high fertility on the human capital of these children.

Johnson-Hanks (2003) using an empirical approach show that the methods used by women to limit births depend on their level of education. Indeed, she notes that in Kinshasa, Shapiro and Tanbashe (1997) [2] showed that while highly educated women use modern contraceptives to reduce the number of children, women with low levels of education use abortion ; uneducated women use neither method.

It may be that some parents who acquire wealth in the non-educational sectors have a different way of thinking about their children's education, some of them thinking that if they are rich without education, their offspring will also be rich without education. Domo (2010) on education and fertility in the north of Cameroon notes that, parents in this region in the majority have always judged their wealth through the herds, the land. These parents then think that children are more profitable by keeping herds, fishing or farming. It should be noted that this idea is a great obstacle to the education of children and especially young adults, as shown in the study by Aisa et al (2014) on the Rome population of Spain.

Indeed, in Northern Cameroon where the Muslim population is dominant, young boys are forced by their parents to leave school early to help them, and young girls drop out of school for marriage. Adult boys are given their own herds and land by their parents immediately and are therefore motivated to marry and have children. According to the customs of Northern Cameroon in general and of Muslims in particular, the girl is made for marriage and should play the role of mother of a family, a wife and therefore should not have access to education (Domo, 2010).

These different problems do not only exist in North Cameroon, Muslims in other regions live almost the same story. 75% of the Bamoune population in West Cameroon is Muslim. Young people in this department have the same problems as those in the North about non-enrolment and early marriages. They are found more in sectors such as : commerce, driving, agriculture and guarding.

Sonzia's (2012) empirical study of fertility in northern Cameroon shows that more than 50%

2. See Johnson-Hanks(2003)

of women are employed in agriculture and commerce, while less than 2% are managers, most of whom are independent. She found that there is a big difference between Catholic/Protestant and Muslim women depending on the level of education. With a population of over 84% Muslim, the proportions of Muslim women with secondary school or higher education were 2.06 in 1991 ; 3.95 in 1998 and 5.18 in 2004 compared to 14.78, 17.01 and 18.94 for Catholic women during the same periods.

Although these studies on Cameroon allow us to understand that the Cameroonian Muslim community is a minority group in terms of religion ; they do not, to our knowledge, study the incentives of parents in this group to high fertility. It is for this reason that we want to address the issue of fertility and education of the Muslim community in Cameroon through the minority aspect of this group in order to identify the key factors that encourage parents of this group to high fertility.

3 Data and methodology

We will use secondary source data from the Integrated Public Use Microdata Series (IPUMS) database. For Cameroon, this database provides us with data for only three years : 1976, 1987 and 2005 but we will use 2005 data for this study. This will be data on fertility, education and religion.

Although this database gives us a great deal of information on Cameroonian households, we have encountered some limitations for some important data for the study of fertility. Indeed, the existing economic literature showed us that, in general, fertility is strongly related to the standard of living of households, but in our database, we did not have the data to measure this standard of living. Furthermore, the literature on fertility among Muslim women in Cameroon shows that the high number of children in this group is due to the practice of animal husbandry, agriculture and fishing. However, we have not had data that would allow us to measure the impact of these practices, although some studies show that these practices encourage young children to leave school to help parents and become self-sufficient, and consequently parents are encouraged to high fertility (Domo, 2010). We also noted from Johndon-Hanks (2003) that the high fertility of Muslim women is also due to their low use of contraceptives and their young age. But the database does not tell us about variables that allow us to judge the effects of contraceptive methods and age at first marriage on women's fertility.

3.1 Distribution of variables

Cameroon is divided into ten main regions : Adamaoua (Adam), Center, East, Far North(FN), Littoral, North, North-West(N-W), West, South, South-West(S-W) ; within which there is a multitude of ethnicities and religions. There are more than 250 ethnic groups in the country, and about ten religions. Depending on the geographical distribution of the country, the different ethnic groups and religions can be found in all the major cities of the country.

3.1.1 Distribution of the Cameroonian population by region

Table1 : Distribution of the Cameroonian population by region

Region	Adam	Centre	Est	FN	Littoral	North	N-W	West	Sud	S-W
Frequency(%)	5.1	17.9	4.4	17.6	14.4	9.6	9.9	9.8	3.7	7.5

From Table 1, we note that the Southern region was the least populated in Cameroon according to IPUMS 2005 data, followed by the Adamaoua region ; on the other hand, the central region was the most populated region followed by the Far North.

3.1.2 Distribution of the Cameroonian population by religions groups

TAble2 : Distribution of the Cameroonian population by religion [3]

Religion	Unk	Catho	Ortho	Protes	OthChris	Musl	Anim	Othrel	F-T
Frequency(%)	1.4	37.9	0.5	25.9	4.0	20.6	5.5	1.0	3.2

Table 2 shows us that at the country level, Christians (Catholic, Orthodox, Protestant and others) are the most numerous. They are followed by Muslims and Animists respectively. Other religions, pagans, Free thinker and people of unknown religion are negligible.

3. UnkUnknown, Catho=Catholic, Ortho=Orthodox, Protes=Protestant, OthChris=Other Christian, Musl=Muslim, Anim=Animist, Othrel=Other religion and F-T=Free thinker

3.1.3 Percentage proportion of religious groups by geographical area

The following table represents the religious proportions in each region [4] in Cameroon, this table shows that the three main religions in Cameroon are Catholic, Protestant and Muslim. Furthermore, with the exception of Catholics and Protestants, other Christians (Orthodox, Adventists, Pentecostal, Baptists ...) have very small proportions in the regions.

As far as the animist religion is concerned, in 60% of the regions, it has a proportion of less than 1%. As for the other religions, whatever the region chosen, their proportions are less than 2.5%.

Table3 : The shares of religious groups in each region

$\frac{Region \longrightarrow}{Religion \downarrow}$	Ad	Cen	East	E-N	Lit	No	NW	West	South	SW
Unknow	1.2	2.4	1.4	0.6	1.1	1.0	0.9	1.5	2.6	1.5
Catholic	7.3	63.5	42.1	16.8	51.3	26.7	35.4	34.3	38	40.9
Orthodox	0.1	0.4	0.3	0.5	0.5	0.3	0.6	0.3	1.3	1.3
Protestant	18.3	21.1	29.5	14.9	27.8	18.3	49.0	22.1	47.4	36.3
Others Christians	1.4	4.4	5.7	1.3	5.8	1.8	3.0	1.6	4.4	14.0
Muslim	70.8	5.1	17.0	42.4	5.6	39.9	9.0	21.1	3.7	1.2
Animists	0.3	0.4	0.3	20.1	1.1	8.9	0.2	7.9	0.3	0.7
Others religions	0.4	1.0	2.2	0.7	1.7	2.2	0.6	0.6	1.2	1.2
Free thinker	0.1	1.6	1.5	2.6	5.2	0.0	1.1	10.7	1.0	2.9

Table 3 gives us the shares of religious groups in each geographical area (region). We note from this distribution that in the three northern regions, at least 40% of the population is Muslim. These regions are followed by the West and the East with shares of 21.1% and 17% respectively. In the rest, less than 10% of the population is Muslim.

A brief percentage comparison of this table shows us that the Muslim religion compared to other religions is in the majority in the three regions of North Cameroon, but it remains a minority in seven remaining regions compared to the Catholic and Protestant religions. We also note that apart from these three religions (Catholic, Protestant and Muslim), the other

4. Ad=Adamaoua, Cen=Center, E-N=Far North, Lit=Littoral, No=North, NW=North West and SW=South West

religions are in very small proportion in Cameroon with the exception of the animist religion in the Far North region (20.1 per cent).

Furthermore, a breakdown of the Cameroonian population by region and by religious groups showed us that the north concentrates about 73% of the country's Muslims. Thus, 60% of the regions have less than 30% of the Muslim population.

3.1.4 Summary statistics at the individual level

Table4 : Summary statistics at the individual level

	country level		**Muslim group**	
Variable	**Mean**	**Std dev**	**Mean**	**Std dev**
Children ever born	4.41	2.988	4.81	2.16
Children surviving	3.86	2.526	3.221	2.677
Mortality rate(per 1000 births)	118.83	48.20	140.39	40.57
Currently married (%)	69.1	0.462	79.7	0.402
Age	40.78	4.252	40.17	4.079
Rural status (%)	50.4	0.5	60.1	0.490
Labor force participation (%)	56.1	0.495	36.3	0.481
Years of schooling	4.60	4.656	1.68	3.304
Number of observations	**107525**		**19330**	

After considering women aged 35-49, we obtained 107525 observations at the national level and 19330 observations for the Muslim group, whose characteristics are grouped in table 4 above. The description of the samples shows us that in 2005, the fertility rate of Muslim women was higher than the national rate. We also noted that, on average, the mortality rate was higher in the Muslim group (140.39 deaths per 1000 births) than at the national level (118.83 deaths per 1000 births).

On the one hand, at the national level, the average age of the woman is about 41 years, the median woman had an average of 4.41 children of which nearly 3.84 were still alive in 2005, she had an average of 4.60 years of schooling. Nearly 69.1% were commonly married, 50.4% lived in rural areas and 56.1.1% were in the labour force at the time of the survey. On the other hand in the Muslim group, the average age of women is about 40 years, the median woman had an average of 4.81 children of which about 3.22 were still alive in 2005, she had an average of

1.68 years of schooling. Nearly 79.7% were commonly married, 60.1% lived in rural areas and 36.1% were in the labour force at the time of the survey.

3.1.5 The variation of fertility and education

Table5 : The variation of fertility and education

	Children ever born		Years schooling		
Variable	**Mean**	**Std dev**	**Mean**	**Std dev**	**Observations**
1976	0.78	1.665	1.75	2.865	736514
1987	0.82	1.699	2.61	3.544	897211
2005	0.85	2.036	3.90	4.601	1772359

In the table below, we have considered data on all households for the three survey years and at the national level. As a national average, the number of children already born is very low : this is due to the fact that we have all households in these calculations. This description shows us that the number of children born per household and the number of years of schooling increased between 1976 and 2005.

3.2 Methodology

Based on the work of Aisia et al (2014) in Spain and Bezin, Chabé-Ferret and De La Croix (2018) in Indonesia, we will build a model of fertility of the Muslim community in Cameroon. This study will therefore attempt to relate the number of children born to a woman to a certain number of variables in order to identify the key elements that encourage parents in this community to have more children.

An important step will be to construct the variable that makes it possible to measure the parents' bargaining power. To do this, we considered the ten regions of Cameroon as geographical areas, then we divided the population into religious groups. For each of the geographical areas we calculated the share of each religious group (See Table3 above). Thus, in order to have our indicator capture the bargaining power of a parent, we assigned the share of his religious group according to his geographical area.

Once these proportions are calculated, we construct the variable religious proportion (Prorel) afterwards. To do this, for each woman in the sample we identify her region of residence and

her religion, then we assign her the proportion of her religious group in that region.

Since some of these proportions are very low, any individual whose religious proportion in a region is less than 1% will be excluded from the analysis. In order to carry out the various regressions, the variable representing religious proportion will be transformed into a categorical variable in the following way : individuals with religious proportions between 1% and 10% constitute small minority groups, between 10% and 30% constitute minority groups, between 30% and 60% constitute medium-sized groups and, finally, majority groups are those with proportions between 60% and 100%.

Moreover, Table 3 above shows that only Muslim women in the Adamaoua region are part of the majority groups. In five regions, Muslim groups are small minority groups (Central, Littoral, North West, South and South West), they are a minority in the East and West regions and medium size in the far North and North.

In analyzing our data, we define below an econometric model that will be estimated by one step for all women in the selected age group, then the same model will be estimated for married women only. For this model we will make a comparative study between the Muslim community and Cameroon as a whole. Thus, we consider all women between the ages of 35-49.

The mortality rate used in this study is that calculated at the district level, we defined it from the variables number of children born to a woman and number of children surviving.

With respect to the fertility model, it takes the form of the following econometric equation :

$$Nchib_i = \alpha_0 + \alpha_1 Ysch_i + \alpha_2 Age_i + \alpha_3 Stra_i + \alpha_4 Mortalrate_i + \alpha_5 Proprel_i + \alpha_6 Labfor_i + \alpha_7 relg_i + \alpha_8 Eduattain_i + \varepsilon_i . (1)$$

Where Nchib is the number children ever born, Ysch represent the years of schooling, Age is the age, Stra is the strata of residence (urban or rural), Proprel is the parent's power, Mortalrate is the mortality rate, Labfor represent the labor force participation status, relg is the religion group and Eduattain is the level of education attained.

In order to better evaluate the effect of the explanatory variables on the explained variable, we had recoded the variables such that Age, Stra,Marstat, Eduattain, Proprel, Labfor and relg to obtain some dummies.

4 Data Analysis

In this section, we will analyse the data using econometric equation (1) according to the national level and the Muslim group. For categorical variables, we will use the dummy variables obtained by recoding.

4.1 Distribution of women by religions groups

Religion	Unk	Catho	Ortho	Protes	OthChris	Musl	Anim	Othrel	F-T
Frequency(%)	1.5	38.5	0.5	27.3	4.1	17.7	6.0	1.5	3.0

In this paragraph, the study concerns only women, we note that the distribution of women according to religious groups is very similar (in terms of frequency) to the distribution of the Cameroonian population as a whole. The Muslim religion occupies third place in Cameroon after the Catholic and Protestant religions.

4.2 Distribution of women by marital status(%)

	Single	Married	cohabitation	Separated	Divorced	Widowed	Total
National level	13.8	69.1	3.6	2.2	2.1	9.3	100
Muslim religion	7.7	79.7	0.8	1.4	2.9	7.6	100

The above table shows us that in 2005, the proportion of married Muslim women was 79.8 per cent compared to 69.1 per cent for married women at the national level, giving us a gap of 10.6 per cent. We also note that about 3 out of 100 Muslim women were divorced compared to about 2 out of 100 women at the national level. For the other modalities of marital status, the proportions at the national level were higher than those of the Muslim group.

4.3 Distribution of women by education level(%)

In the following table, Less or pri inco= Less or primary incomplete, Pri Comp=Primary completed, Sec comp=secondary completed and Uni Comp= University completed.

	Unknown	Less or Pri inco	Pri comp	Sec Comp	Uni comp	Total
National level	2.1	44.7	47.1	4.7	1.4	100
Muslim religion	3.2	77.8	17.7	0.9	0.5	100

The distribution shown above indicates that in 2005, Muslim women were the least educated. About 18 out of every 100 women among them had a complete primary education compared to nearly 47 out of 100 overall. Barely one in 100 Muslim women had completed high school and they were almost absent at the university level. Furthermore, although women were more likely to reside in rural areas, the table below shows that the proportion of Muslim women in this area was the highest (about 60 percent).

4.4 Distribution of women by place of residence and labor force participation

	Place of residence(%)			**Labor force participation(%)**		
	Rural	Urban	Total	yes participation	no participation	Total
National level	50.3	49.7	100	56.1	43.9	100
Muslim religion	60.1	39.9	100	36.3	63.7	100

The above distribution shows that women reside much more in rural areas, especially Muslim women. In terms of labour force participation, almost two thirds of Muslim women do not participate in the labour force, while at the national level more than half of women participate in the labour force.

The following table presents the results of our estimates for econometric equation (1).The analysis of model (1) considers all women in the sample while the analysis of model (2) considers only married women.

4.5 Model results

	National level		**Muslim group**	
	Model (1)	Model (2)	Model (1)	Model (2)
Variable	**Coef**	**Coef**	**Coef**	**Coef**
Const	3.064^{***}	3.321^{***}	3.743^{***}	3.907^{***}
Yeaschool	-0.004^{***}	-0.004^{***}	-0.002^{***}	-0.003^{*}
Mortalrate	0.004^{***}	0.004^{***}	0.002^{**}	0.001^{*}
Small minority	0.047	−0.049	−0.126	−0.166
Minority	0.117^{***}	0.031	0.145^{*}	0.066
Medium size	-0.055^{**}	-0.151^{***}	-0.165^{**}	-0.224^{***}

36 years	0.151***	0.178***	0.041	0.036
37 years	0.227***	0.256***	0.197*	0.195
38 years	0.284***	0.304***	0.193*	0.245*
39 years	0.397***	0.381***	0.180	0.126
40 years	0.372***	0.390***	0.437***	0.475***
41 years	0.611***	0.648***	0.791***	0.940***
42 years	0.523***	0.521***	0.725***	0.708***
43 years	0.676***	0.671***	0.816***	0.909***
44 years	0.754***	0.814***	0.926***	0.950***
45 years	0.613***	0.648***	0.370***	0.430***
46 years	0.734***	0.738***	0.494**	0.726**
47 years	0.833***	0.833***	0.777***	0.705***
48 years	0.853***	0.901***	0.688***	0.829***
49 years	0.870***	0.788***	0.620***	0.484**
Prim compl	−0.148***	−0.107***	−0.113*	−0.111
Sec compl	−0.720***	−0.726***	−0.748***	−0.639**
Uni compl	−0.491***	−0.507***	−0.088	−0.114
Rural	1.324***	1.251***	1.106***	1.071***
Yes,In the labor force	−0.068***	0.015	−0.102**	−0.026
NotReligion	0.090	0.030		
Protestant	−0.074***	−0.042		
Oth Chris	−0.195	−0.170		
Muslim	0.058**	0.026**		
Animists	0.063	−0.030		
Oth rel	−0.158	−0.167		
R^2	0.098	0.084	0.039	0.032
F	832.525	231.850	32.895	25.221
$Pvalue$	0.000	0.000	0.000	0.000

Dependant variable= Number of children ever born

Note : *= significance at 10% ****=significance at** 5% *****= significance at** 1% **; Age (Ref=age1=35 years old), Urban strat (ref=urban), Education attainment (ref=Less than primary completed), Religion (Ref=Catholic), Prorel(ref=Majority),**

Labor force Participation (ref=not in the labor force)

From these results, we note that the independent variables taken into account in the models give a very weak explanation of the dependent variable (with the R-squared between 3.8 per cent and about 10 per cent), nevertheless the models are globally significant (p value=0.000).

The variable Mortality rate is very important for our study. It positively and significantly affects the number of children born to a woman, regardless of the model or sample. The coefficients are the same for models (1) and (2) at the national level, but in the Muslim group sample the coefficients are different for these models even this difference is very small. When the mortality rate increases by one unit per 1,000 births, the average number of children born to a woman also increases by 0.004 for the national sample. In the Muslim group, for the same variation in the mortality rate, the average number of children of Muslim women increases by 0.002 in the general case and by 0.001 for married women.

On the other hand, Table 4 shows us that, on average, the mortality rate is higher in the Muslim group 140.39 per 1000 births compared to 118.83 per 1000 births at the national level. This is linked to the results that the regression can already give us an explanation for the high fertility in Cameroon.

But note that although the sign of the coefficients of the mortality rate is as expected, we have a surprising result when comparing the coefficients of the two samples. In short, the increase in the average number of children due to mortality was expected to be higher in the Muslim group (which has the higher mortality rate) than at the national level, but the opposite was observed.

Whatever the sample, the number of years of schooling negatively and significantly affects the average number of children born to a woman. Compared to women at the national level, Muslim women study less and their fertility drops less strongly with an additional year of schooling. At national level both models have the same coefficient for this variable (-0.004), so when a woman has an extra year of schooling, her fertility drops by 0.004 units. In the Muslim group on the contrary the two models have the different coefficients for this variable (-0.002 and -0.0003 for models (1) and (2) respectively). An additional year of study by a Muslim woman lowers her fertility by 0.002 units in general, among married Muslim women in particular, the decrease is 0.003 units.

Thus the lack of schooling among Muslim women is another reason for their high fertility, as Table 4 shows that, on average, the number of years of schooling in this group is 1.68 years

compared to 4.60 years at the national level.

The religious proportion, represented here by Prorel, measures the share of a given religion in each region of the country. For the prorel variable, we note that compared to majority groups, the small minority group does not affect the number of children born to women in all samples. As for the minority group, it does not affect the fertility of married women at the national level as well as that of the Muslim group. The minority modality compared to the majority group (for models (1)) has a positive and significant effect on the average number of children born to women (1% and 10% at the national level and in the Muslim group respectively). Thus, a woman from the minority group has on average 0.117 and 0.145 more children than a woman from the majority group at the national level and in the Muslim group respectively. Thus, the increase in the average number of children due to the minority status of a group is greater in the Muslim group than at the national level.

Finally, the mean height modality negatively and significantly (at 5% for models (1) and 1% for models (2)) impacts the number of children born compared to the majority modality. Compared to a woman from a majority group, a woman belonging to a medium size group has on average 0.055 and 0.165 fewer children than a woman from the majority group at the national level and in the Muslim group respectively. The decline in the average number of children born to women due to the medium size status is greater in the Muslim group than at the national level.

Our results thus show us that the shares of religious groups in each region, which measure parental power in a region, plays an important role in the Muslim group, which is in the minority here. As this power increases, parents in the minority group are encouraged to have more children. In the end, we find that regardless of the sample, the small minority status has no effect on the number of children born to women.

With respect to age, we find that women over 40 years of age increase the average number of children born compared to those over 35 years of age for both models and both samples. The number of children increases significantly up to the age of 44, with the highest average number of children born being found in the Muslim group.

Regarding the variable education attainment, we note that for the national samples, the highest level of education attained by a woman is a very important factor for the reduction of her fertility. For models (1) and (2) respectively and compared to a woman who does not have a complete primary education, a woman with a complete primary education has an average of

0.148 and 0.107 fewer children, a woman with a complete secondary education has an average of 0.720 and 0.726 fewer children and a woman with a complete university education has an average of 0.491 and 0.507 fewer children. At the level of the Muslim group, The modality university completed has no impact on the number of children born to women. The primary completed modality does not affect the number of children born to married Muslim women, but in the sample of all Muslim women aged 35-49, a woman who has completed primary school has on average 0.113 fewer children than a woman who has not completed primary school. A woman with full secondary education has an average of 0.748 fewer children than a woman who has not completed primary school (model (1)), while a married Muslim woman with full secondary education has an average of 0.639 fewer children than a woman who has not completed primary school.

We can therefore understand why in 2005, the fertility of Muslim women was the highest. In fact, almost 78% of Muslim women aged 35 to 49 had not finished primary school. Furthermore, Muslim women compared to women without religion are more likely to have more children.

Compared to a woman who resides in an urban environment, that of the rural environment is more likely to have a high number of children. Indeed, the rural environment compared to the urban environment affects positively and significantly (at 1%) the number of children born to women. However, coefficients are smaller in the Muslim group models. In fact, a married Muslim woman living in a rural environment compared to her sister in an urban environment has on average 1.071 more children. Nationally, a rural married woman compared to an urban married woman has on average 1.251 more children. With regard to models (1), a woman living in a rural area has on average 1,324 (national level) and 1,106 (Muslim group) more children than a woman living in an urban area.

Moreover, the distribution of the population according to place of residence has shown us that the populations under consideration are more rural, which may also give us one of the origins of high fertility in Cameroon. Although the increase in the number of a woman's children due to the fact that she resides in rural areas is lower among Muslim women than among women in the same area as a whole, one can understand the high fertility of Muslim women, as 60.1% of them reside in rural areas compared to 50.3% at the national level.

As for women's participation in the Labor force, the results show us that the modality yes participates in the workforce does not affect the number of children born to a woman in the

married samples, for the other samples it has a negative and significant effect on the number of children born to a woman (at 1% (national level) and 5% (Muslim group)). We note that at the national level, compared to a woman who does not participate in the labour force, the woman who does participate has on average 0.068 fewer children. Among Muslim women, compared to a woman who does not participate in the labour force, that one who participates has on average 0.102 children is 0.102 less.

The decline in fertility as a result of women's participation in the labour force is greater in the Muslim group. But although this is the case, the fact that fertility was higher in this group in 2005 does not surprise us, as only 36.3% of Muslim women participated in the labour force compared to 56.1% at the national level.

As for the effect of a religious group on fertility, although Protestant and other Christian modalities compared to Catholic ones negatively and significantly affect the number of children born to women, they do not have an effect on the number of children of the tides in particular. A Protestant woman has an average of 0.074 fewer children than a Catholic woman, and a woman from the other Christian group has an average of 0.195 fewer children than a Catholic woman. Moreover, the Muslim modality is the only one with a significant impact on the number of children born to a woman for both models. A Muslim woman has on average 0.063 (model (1)) and 0.030 (model (2)) more children than a Catholic woman.

5 Conclusion

The objective of this work was to identify the factors that drive Muslim women to high fertility. Specifically, we wanted to study whether parental affiliation could encourage them to have more children. Thus, based on the existing literature on women's fertility, several variables were considered in defining the regression model. An important phase in our work was to construct a variable measuring parental bargaining power. This variable was constructed by calculating the proportion of each religion in the ten regions of Cameroon, then the power of a given parent is the proportion of his or her religion in the region where he or she resides.

This variable was then transformed into a categorical variable and for the regression we had the dummies for this variable. From this transformation, we found that the minority status of a group plays an important role in the high fertility in Cameroon. Compared to the majority status, a woman's minority status encourages her to have more children, especially among Muslim women. This corroborates the results of Bezin, Chabé-Ferret and De La Croix (2018) in Indonesia and Aisa and al (2014)et al in Spain.

We considered two models in our study, the first considered all women between the ages of 35-49 at the national level and in the Muslim group, while the second considered only married women for both study groups.

Our investigations revealed five main findings : (i) The fertility rate is higher in the Muslim group than in the national group, except for certain modalities (Rural area, which shows that compared to a woman living in an urban area, a woman living in a rural area increased the average number of children born to a woman by 1.324 at the national level, while in the Muslim group this number is 1.106). Similarly, the coefficients of the 45, 46,47,48 and 49 years old modalities, years of schooling and mortality rate are the lowest in the Muslim group.(ii) The minority status of a group, the mortality rate, rural areas, and age are positively and significantly affect the number of children ever born to a woman. (iii) At the national level, a woman's membership of Muslim group has a positive and significant impact on the number of children. (iV) The medium sized groups compared to the majority groups and the participation in labor force compared to not participated decrease the number of children born to a women at the national level and in the Muslim group. (v) A key factor in reducing fertility is the educational level of women, years of schooling and participation in labor force also reduce fertility.

These results allow us to suggest some economic policy recommendations. The implementation of fertility reduction strategies should be encouraged in Cameroon. To this end, an emphasis on educational development would be an asset. To that end, the Government must encourage the woman to go to school by increasing the number of schools and even subsidizing education, it must also encourage the participation of women in the labor force. It must make that community aware of the importance of education and set up an education system that could accommodate all social strata. For example, making school free in rural areas would allow more women to have access to education.

In summary, we note from the results of this study that the key factors that encourage Muslim women to have many children are, on the one hand, their membership in minority, the higher mortality rate and, on the other hand, their low level of education and their low rate of participation in the labor force.

Bibliography

Aisia and al (2014), "Fertility patterns in the Roma population of Spain", university of Zaragoza.

Bezin, Chabé-Ferret and De La Croix (2018),"Strategic Fertility, Education Choices, and Conflicts in Deeply Divided Societies."

Bongsuiru S. T. (1993),"Education des femmes et fécondité au Cameroun", Regional lnstitute for Population Studies, Accra.

De la Croix and Doepke (2003), "Inequality and Growth : Why Differential Fertility Matters". American Economic Review, 93(4) : 1091-1113.

De La Croix, David, and Davide Dottori. (2008), "Easter Island ?s collapse : a tale of a population race". *Journal of Economic Growth* 13 (1) : 27-55 (March).

Domo, Joseph. 2010. *Le Nord du Cameroun : mythe ou réalité*. Editions L'Harmattan.

J. Johnson-Hanks (2003) :"Education, Ethnicity and Reproductive Practice in Cameroon", *In : Population (English edition)*, 58^e année, $n^0 2$, 2003. pp. 153-179.

Graham-Brown, Sarah. (1994) "The role of the curriculum". Chapter 6 *of Education rights and minorities*. Florence : Minority Rights Group and Unicef.

Joseph Alfred Grinblat, "L'évolution de la fécondité dans le monde depuis 1965 et ses conséquences". *Dans Mondes en développement* 2008/2 ($n^0 142$), pages 13-22.

MUGNY, Gabriel, PAPASTAMOU, Stamos (1977), "Pour une nouvelle approche de l'influence minoritaire : les déterminants psychosociaux des stratégies d'influence minoritaires". Bulletin de psychologie, 1977, vol. 30, $n^0 328$, p. 573-579

René Otayek, "L'Afrique au prisme de l'ethnicité : perception française et actualité du débat ", *Revue internationale et stratégique* 2001/3 ($n^0 43$), pages 129- 142.

Sonzia T. (2015), "Fertility trends by ethnic group's in Cameroon : evidence from three Demographic an Health Survers", Institut de Démographie de l'Université de paris 1.

Sonzia T. (2012),"Mutations sociodémographiques, économiques et culturelles au Cameroun : vers une baisse de la fécondité dans le septentrion ? "

Yuval-Davis, Nira. (1996), "Women and the biological reproduction of the nation". *Women's Studies International Forum* 19 (1) : 17-24. Links Across Differences : Gender, Ethnicity, and Nationalism.