The Influence of Education on Fertility in Latin America

Elsa Ortiz, Centre d'Estudis Demogràfics. *Email (oravelsa@gmail.com)*
Daniel Devolder, Centre d'Estudis Demogràfics

Abstract: In Latin America there is scarcity of literature relating the fall in fertility with the increase on the level of education. Hence, in this paper we focus on education as a primary variable where our main objective is to analyze the trends in fertility in Latin America by studying eight countries (Bolivia, Colombia, Haiti, Honduras, Mexico, Nicaragua, Peru and Dominican Republic) and comparing their Total Fertility Rate (TFR) by level of education. The data source used for Mexico is the National Survey of Demographic Dynamics conducted in 2009, and for the other Latin American countries we used the Demographic and Health Surveys. For the purposes of the study the editions of this survey are the following: Bolivia 2008, Colombia 2010, Haiti and Honduras 2005-2006, Nicaragua 2001, Mexico 2009, Peru 2007-2008 and Dominican Republic 2007. In order to compare the levels of fertility by educational attainment for the 8 countries we used three series of TFR. The first is a 10 year computed overall TFR for each country, while the next series are the first and third child order TFR, both calculated by educational level. In order to predict the values of being a mother or not, when comparing with the results of the previously calculated TFR, the variable that better adjusts is the interaction between the age of the woman and the birth year of occurrence. This analysis is done by fitting a logistic regression model. The first results show that despite the fact that Latin America has predominantly low and medium educational levels, there is a fall in fertility and a delay in the age at first and third motherhood especially among highly educated women.

1. Introduction

Since the mid-twentieth century fertility in Latin America also experienced a huge decline due to the development process initiated in its countries. The decline in fertility in this region is associated with socioeconomic and cultural differences between developed societies. Even though this fall took place firstly among more educated women with higher incomes, today this phenomenon can also be seen among those with fewer years of schooling and income (Schkolnik and Chackiel; 1998).

In Europe, a large number of studies attribute the fertility decline primarily to a major economic investment for these countries, the rise in women's educational level. Not only educational expansion has been a key in this process, it is also the increase of women in the workforce, the importance women give to their career, financial independence they have gained in recent years, the cost and viability of childcare, globalization, labor market uncertainty and the correct regulation of fertility through contraception among other causes.

However, in Latin America there is scarcity of papers that relate the fall in fertility with the increase on the level of education, so in this paper we focus on education as a primary variable.

The main objective of this paper is to analyze the trends in fertility in Latin America where we studied eight countries (Bolivia, Colombia, Haiti, Honduras, Mexico, Nicaragua, Peru and Dominican Republic) and made a comparison between the countries Total Fertility Rate by level of education.

2. Data and methods

The data source used for Mexico is the National Survey of Demographic Dynamics conducted in 2009 and for the rest of Latin America we used the Demographic and Health Surveys. For the purposes of the study the editions of this survey are: Bolivia 2008, Colombia 2010, Haiti and Honduras 2005-2006, Nicaragua 2001, Mexico 2009, Peru 2007-2008 and Dominican Republic 2007.

This first set of results is the percentage of women by education level and birth cohort. We used the age of completion of studies grouped into 4 categories.

For the next set of results, three indicators were calculated, the total fertility rate (TFR) and the median age at motherhood (MAM). At the end we calculated the ratio orders for the contribution of each rank in the result of the TFR.

A third set of results was carried out in order to predict the values of being a mother or not, depending on the age of the woman and the birth year of occurrence, so we can compare these results with the previously calculated TFR. This analysis is done by fitting a logistic regression model.

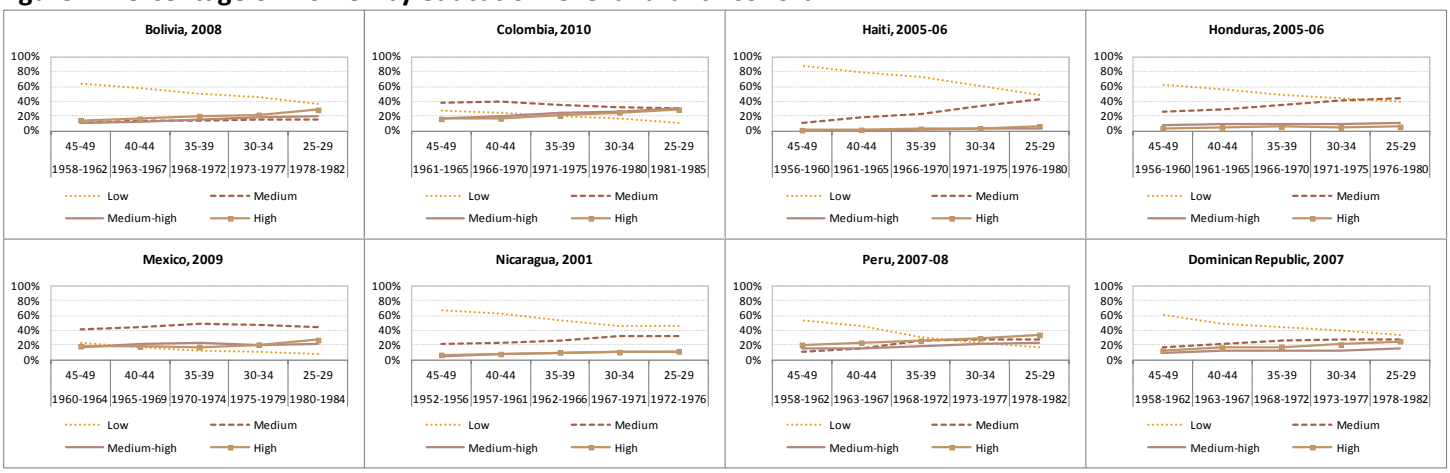
3. Results

3.1 Comparison of the educational level

Educational expansion in Latin America has been slow, as in the decade of the 50s most women had low educational level, except Mexico and Colombia which had medium educational level. Thirty years after the medium educational

level prevailed, however, in half of the countries there is significant high percentages of low educational level (Figure 1).

Figure 1. Percentage of women by education level and birth cohort



3.2 Comparison of fertility by education level

In order to compare the levels of fertility by educational attainment for the 8 countries we used three series of TFR. The first is a 10 year computed overall TFR for each country, while the next series are the first and third child order TFR, both calculated by educational level. These series are smoothed because they exhibited annual oscillations due to random factors.

The highest TFR in the selected countries is in Haiti, between 1995 and 2004 it was 4.4 children per woman, and a little lower in Bolivia (between 1997 and 2006), Honduras (1995 and 2004) and Nicaragua (1991 and 2000) with about 4.1 children per woman. In Peru it was 3.1 between 1994 and 2000. In Dominican Republic, Colombia and Mexico the TFR was less than three children per woman (Figure 2).

In order to find differences by educational level among countries, the TFR for the first child is studied. For example in Haiti, Honduras and Nicaragua there are significant differences between women with low and high educational level. A curious case was seen in Mexico where there are large differences between high and low educational levels, however they are not as important as those between the highest and the middle.

According to Figure 3 in all the countries there are differences of about four years in the MAM between highly educated women and women with low education. The difference in Honduras is more than 6 years. In this country and in Nicaragua it is clearly a delay of the age at first maternity among highly educated women.

Figure 4 shows how third order TFR falls along the period for each educational level. Unlike the results obtained with the first order TFR, for the third one there are strong differences by educational level in all countries. Among women with medium and low educational levels significant differences in TFR can also be observed.

The differences in median age at third maternity between highly educated women and women with low education are so visible. There are countries where the median age at third child is around 34 years old for highly educated women; while for those who have low education median age is around 26 years old. In countries like Peru and Nicaragua there is a clear median age at third maternity increase in women with higher educational levels.

3.3 Regression model fit

According to figure 9, one can see that the model which includes an interaction between the variables year of birth and age of women better fit the women's TFR compared to the model where the variables were entered without interaction. The last set of results, where the educational level is introduced in the model, is reserved for the presentation of this work in the EPC.

4. Conclusions

It is clear that in the countries of this study, there is large potential for fertility decline, and educational expansion is a factor that can accelerate it and delay the age at first motherhood. Our results reveal that there is a close relationship between the level of education, age at first motherhood and the number of children. Although in all countries there are differences among women with low education and high educational levels, there are no differences between women with medium and low educational ones.

Figure 2. First TFR order by period and educational level

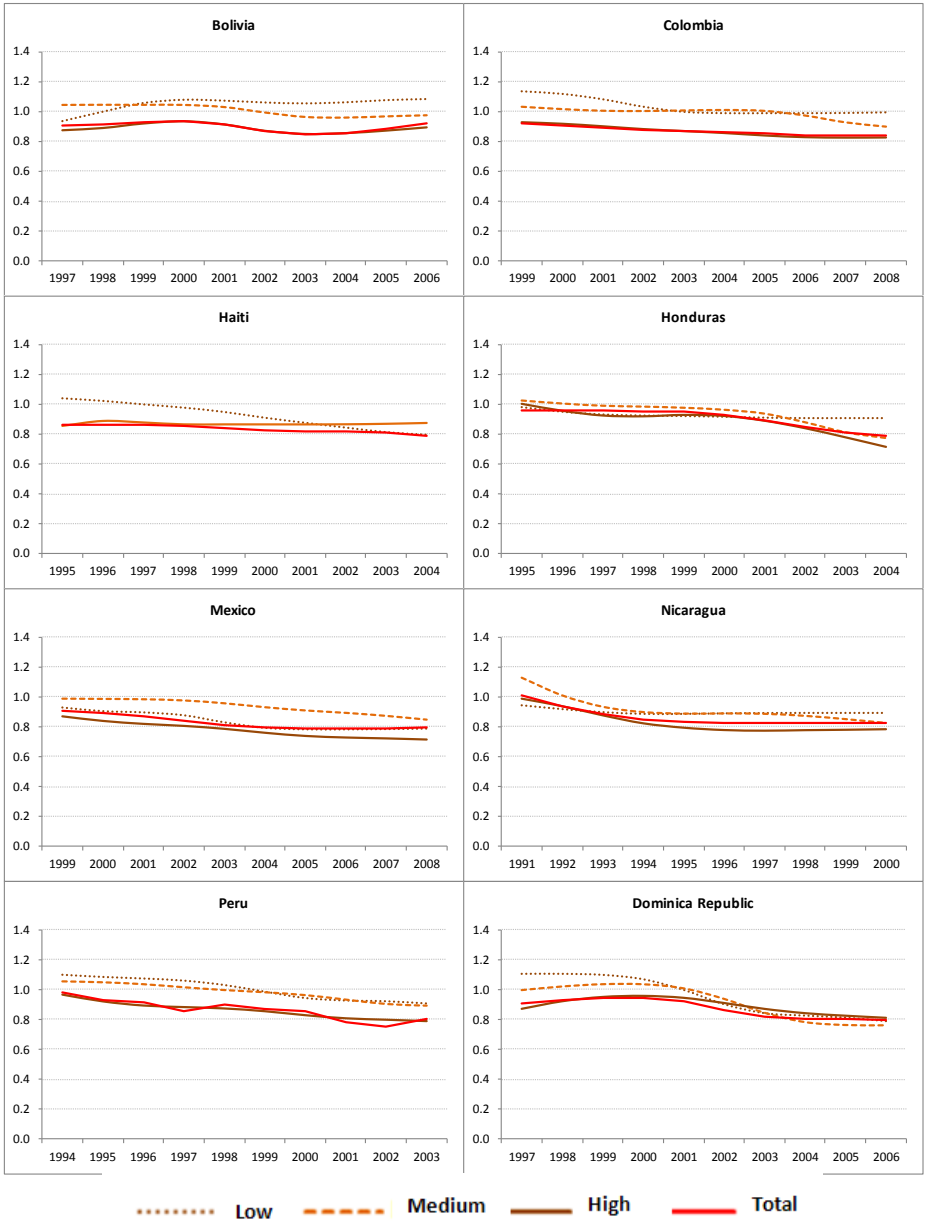


Figure 3. MAM by period and educational level

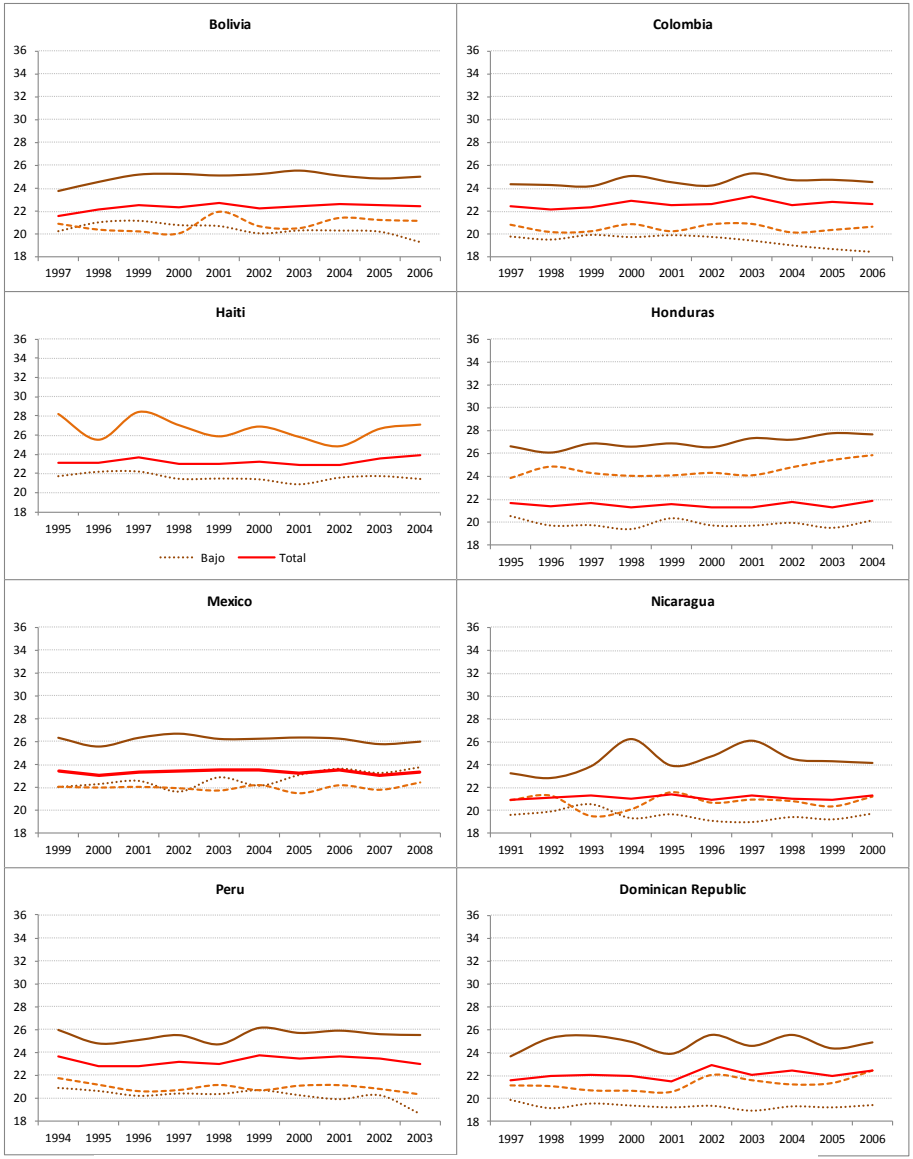


Figure 4. Third TFR order by period and educational level

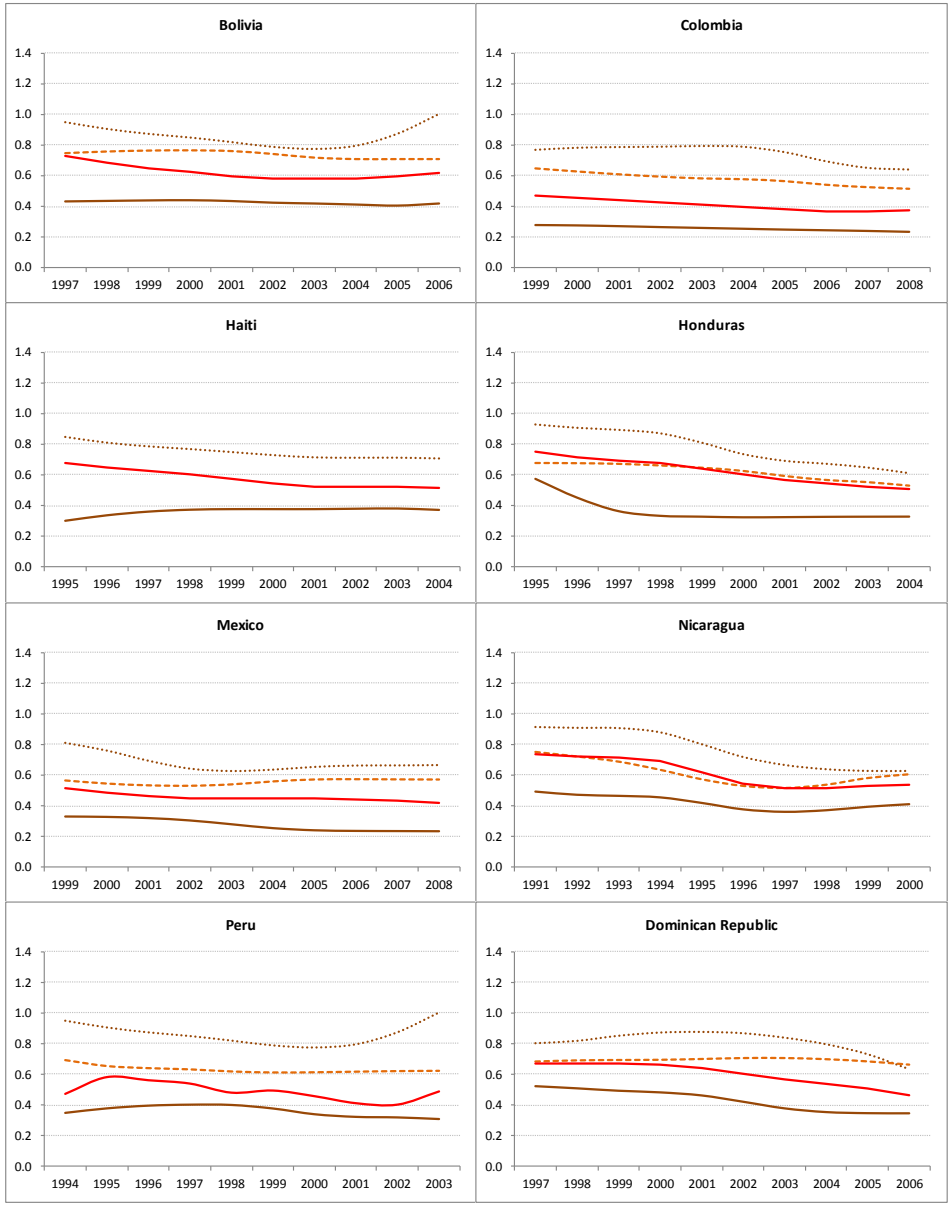


Figure 5. Median age at third motherhood by period and educational level