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# THE EDUCATION–FERTILITY RELATIONSHIP IN BOSNIA AND HERZEGOVINA

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*ABSTRACT*

***The education-fertility relationship in Bosnia and Herzegovina***

*Education and fertility are considered to be the fundamental processes for the continuance of society. This paper presents an overview of the relationship between women's education and fertility patterns in Bosnia and Herzegovina. Given the complicated political situation the complete results of a long-delayed Census in Bosnia and Herzegovina, which was held in 2013, are not yet published and therefore we addressed the data on the female population of the last relevant Census held in 1991. The analysis suggests that higher educational levels are associated with lower fertility rates. However, a substantial difference exists in the scale of the gap between upper and lower educational strata, as well as between urban and rural areas within the country. Results of this study also indicate that the role of schooling effects reproductive behavior of the female population in urban and rural areas of Bosnia and Herzegovina.*

*KEY WORDS*

*Education, fertility patterns, Bosnia and Herzegovina, total fertility rate, urban and rural areas, reproductive decision-making, demographic transition*

## 1.Introduction

Education has long been recognized as a crucial determinant influencing women's childbearing behavior and fertility patterns. An extensive demographic literature is devoted to examining the role of female education in promoting sustained fertility decline (Cochrane, 1979; Becker, 1991). Women's education has been one of the most thoroughly studied determinants of fertility, with the perspective now often extended to include the closely related 'women's position', but the research area is still far from being exhausted.

The possible importance of 'mass education' was discussed by Caldwell (1980) many years ago, and has occasionally been touched on in more recent reviews (see e.g. Cleland and Jejeebhoy, 1996; Axinn and Barber, 2001; Jejeebhoy, 1992), but little empirical evidence has so far been accumulated. There is a need to assess how expansion of education influences fertility, and to estimate the effects of a woman's own education. The timing of childbearing is also an increasingly important aspect of fertility patterns in low fertility contexts. Most analyses of the timing of fertility - including those in Kohler et al. (2002) - emphasize the role of human capital investments in early adulthood, and in particular the substantial increases in females' investments in higher or professional education, in response to increased returns to human capital, improved access to the labor market and more effective contraception (see for instance Gustafsson, 2001; Goldin and Katz, 2002). Kohler et al. (2002) have argued in their analyses of declines of the total fertility rate (TFR) below 1.3 — or to lowest-low fertility levels — that the postponement of fertility in connection with these TFR declines is due to two factors: first, socio-economic incentives such as increased returns to education or high levels of youth unemployment that make late childbearing a rational decision for couples or individuals, and second, social interaction effects that reinforce the trends towards delayed childbearing through social learning, social influence and other feedback effects that affect the timing of fertility (Skirbekk et al., 2004).

Although the association between education and fertility was a constant theme in the early literature, the availability of data for the large number of countries that participated in the World Fertility Surveys (WFS) in the 1970s considerably improved our understanding of the relationship. The documentation of empirical patterns for a wide variety of settings inspired increasingly complex views: demographers no longer regarded the impact of education on fertility as automatic, but as conditioned by the level of development, social organization, gender stratification and cultural milieu of the surrounding society (Martin and Juarez, 1995; Kreyenfeld and Andersson, 2014; Lavy and Zablotsky,2015; Canning, D., Günther, I., Linnemayr, S., Bloom, D. 2013).

Education is typically used as an index of the socio-economic position of women having on mind the difficulty of collecting data on income, occupation or social status. Moreover, education is frequently the only available indicator for the more comprehensive concept of women's status, which positions women vis-à-vis men in both the family and society (Mason, 1984; 1986). In explanations of the demographic transition, education has been used as an indicator of socio-economic progress: at the macro social level and at the micro social level educated women present forerunners of fertility patterns and smaller families. Martin and Juarez (1995) inspired by the research of Inkeless (1973) and Eisemon (1987) examine the three key dimensions of education and explore their implications for fertility behavior.

- *Education as a "source" of knowledge.* They found knowledge transmission as probably the most explicit goal of schools. Schooling gives - literacy skills, enables pupils to process a wide range of information, and stimulates cognitive changes that shape an individual's interaction with the surrounding world.

- *Education as a "vehicle" of socio-economic advancement.* Education not only enhances cognitive abilities, it opens up economic opportunities and social mobility. In most societies, educational credentials are the primary criteria for entry into formal employment and for sorting individuals into the hierarchy of occupations.

- *Education as a "transformer" of attitudes.* Schooling's role in attitude formation goes far beyond the enhancement of conceptual reasoning and may lead to crucial transformations in aspirations and, eventually, to questioning traditional beliefs and authority structures.

Educational attainment is linked to wealth and hence to the ability to "afford" more children but, more importantly, education is associated with greater perceived costs of children. Higher standard-of-living goals and higher educational aspirations for children usually lead to the decision to have a small family so that more resources can be allocated to each child (Grönqvist, H., Hall, C. 2013) . Further, education raises the opportunity costs of children by enhancing women's opportunities to pursue wage-earning activities, which are likely to compete with domestic and childrearing responsibilities. So, there is no global relationship between education and fertility; rather, the linkages are both variable and complex (Fiori, F., Graham E., Feng, Z. 2015). Before the discussion of these association proceeds, however, some common associations between different levels of education and reduced fertility can be identified. First, the education to which we refer is formal academic schooling received by children and young people. The suggested associations with fertility should not be generalized to special adult education programs or training within the workplace.

The discussion focuses on female education, although it is recognized that the influence of men is extremely important in reproductive decision making. Finally, this paper focuses primarily on the linkages between education and fertility at the individual level, while bearing in mind that the education system also helps shape societal norms that can affect the fertility of women who do not themselves receive formal education.

## 2. The Education Attainment and Fertility in Bosnia and Herzegovina in 1991

In order to investigate the relationship between education attainment and reproductive attitudes and behavior in Bosnia and Herzegovina, analysis of the fertility rates among women with different education degrees at the municipality level is provided. Considering the fact that the long-awaited results of the Census held in 2013 are not yet published, this study refers to the results of the last relevant Census held in 1991. The intention is to review the existing hypothesis that attributes reproductive differences to specific differences between higher educated and lower educated women in association with socio-economic changes and the fertility transition. So, in this paper this hypothesis is explored by examining data on levels of fertility extended by considerations of the education of the female population.

## 3. Illiterates in the Female Population

Within the post-socialist countries Bosnia and Herzegovina ranks relatively high in educational achievement. The efforts aimed at eliminating illiteracy have been quite successful, and primary schooling, though not universal, is widespread. However, the region is far from homogeneous, and a country's level of socio-economic development continues to influence the availability of educational resources and women's access to them. The literacy issue has been mentioned and partly discussed previously, and it was observed that there was an obvious and sharp decline in the number of illiterate women during the thirty-year (1961-1991) period, by about 40 per cent in the total female population aged 15 or more. So, in 1991 about 80 per cent of women with no education were aged 50 and more. As explained earlier the situations among women with different educational attainments and among women in different age groups slightly vary (Figure 1).

According to the 1981 Census there were 60 municipalities with a share of illiterates in the female population aged 10 or more of between 20-29.9 per cent. This means that more than 50 per cent of municipalities had such a high illiteracy rate in 1981, compared with slightly more than 30 per cent in 1991.

The number of municipalities with more than 30 per cent of illiterate females dropped from 35 to 3 municipalities, which reflects the obvious efforts to acquire greater literacy in Bosnia and Herzegovina during the 1980s (Table 1). Somehow, though, the situation is different among the female population aged 10 to 49. In fact the number of municipalities with the highest percentage (more than 30 per cent) of illiterate women in those ages is much lower in 1991 (only 3) than in 1981 (70), as can be seen in Table 2. We can provide evidence on the extent to which illiteracy and high fertility are linked. Indeed, the 35 municipalities with an illiteracy rate of 30 or more per cent in 1981 maintained a fertility level close to or above replacement level in 1991, even with increased literacy in the ten-year period. Some of those municipalities with high TFRs in 1991 are Skender Vakuf 2.46, Kalesija 2.39, Kotor Varos 2.31, Srebrenica 2.29 and Bratunac 2.07.

*Table 1: Share of illiterates in the female population aged 10 or more (in %), according to Censuses 1981 and 1991*

| **(%)** | **Number of municipalities** | |
|---|---|---|
| | **1981** | **1991** |
| **0-9.9** | 3 | 8 |
| **10-19.9** | 11 | 60 |
| **20-29.9** | 60 | 38 |
| **30 or more** | 35 | 3 |
| | 109 | 109 |

*Source: Author's calculation based on the data from theAgency for Statistics of Bosnia and Herzegovinaand the Federal Office of Statistics of Bosnia and Herzegovina*

*Table 2: Share of illiterates in the female population aged 10 to 49 (in %), according to* ***C****ensuses 1981 and 1991*

| **(%)** | **Number of municipalities according to Censuses** | |
|---|---|---|
| | **1981** | **1991** |
| **0-9.9** | 5 | 29 |
| **10-19.9** | 12 | 59 |
| **20-29.9** | 22 | 18 |
| **30 or more** | 70 | 3 |
| | 109 | 109 |

*Source: Author's calculation based on the data from the Agency for Statistics of Bosnia and Herzegovinaand the Federal Office of Statistics of Bosnia and Herzegovina.*

According to the 1991 Census, at the municipality level the educational structure of the female population in Bosnia and Herzegovina looked as follows. Women who had no education represented 25.8 per cent of the total; women who completed primary school had the highest share (42 per cent) of the female population, while those with completed secondary school

represented 25 per cent. At the same time women with university educational attainment accounted for 4.9 per cent (Table 3).

The expected consequence is a low number of live births among the female population with no schooling: only 915 or 1.4 per cent of the total number of live births. The compulsory education contributed to a higher number of mothers with completed primary and secondary education. So, the number of live births by those mothers was increased and participation in the total number of live births reached 45.4 per cent and 44.7 per cent respectively. At the same time the number of live births given by university educated mothers was 3 877 (5.9%).

*Table 3: Female population by educational attainment, Census 1991*

| **Women by level of education** | **Area** | | |
|---|---|---|---|
| | **Municipality** | **Urban** | **Rural** |
| **No schooling** | 417 246 | 81 399 | 335 847 |
| **Primary schooling** | 679 273 | 253 433 | 425 840 |
| **Secondary schooling** | 404 426 | 254 960 | 149 466 |
| **University Education** | 79 243 | 66 925 | 12 498 |
| **Total** | 1 614 703 | 669 060 | 945 643 |

*Source: Author's calculation based on the data from the Agency for Statistics of Bosnia and Herzegovinaand the Federal Office of Statistics of Bosnia and Herzegovina.*

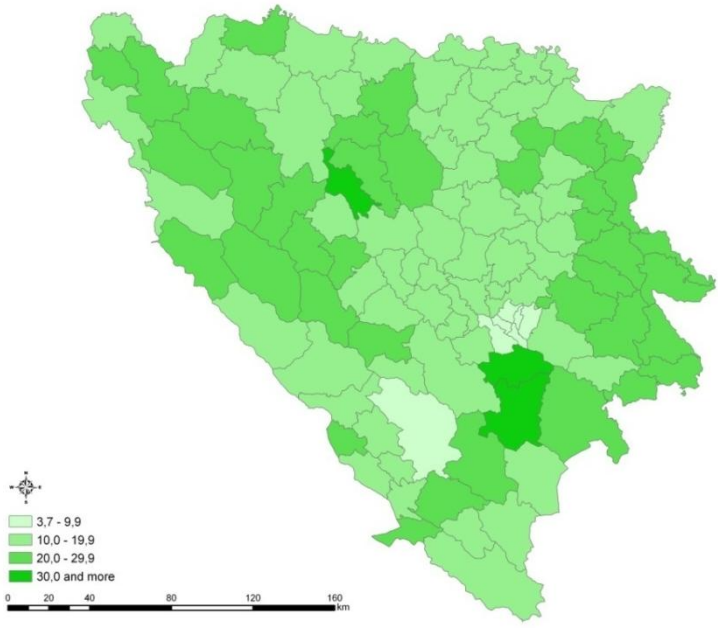


*Figure 1: Share of illiterates in the female population aged 10 or more (in%), Census 1991*

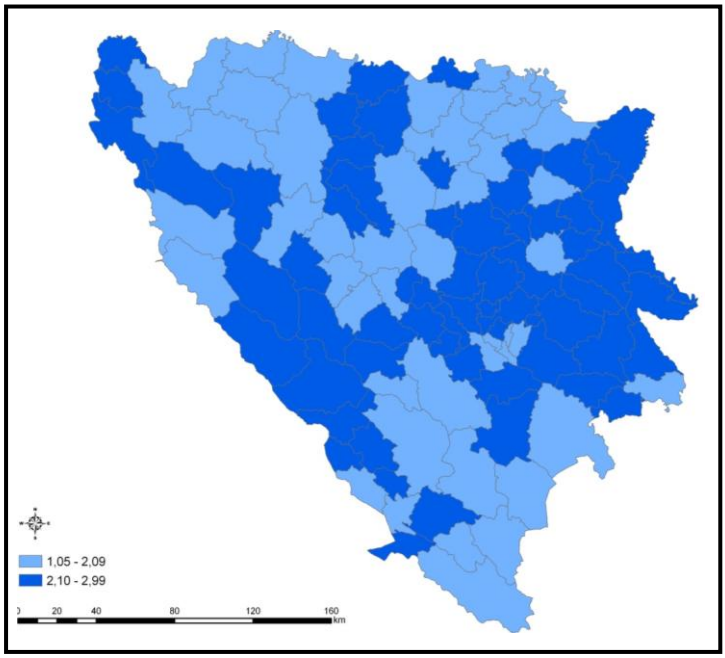


*Figure 2: Urban total fertility rates, Census 1991*

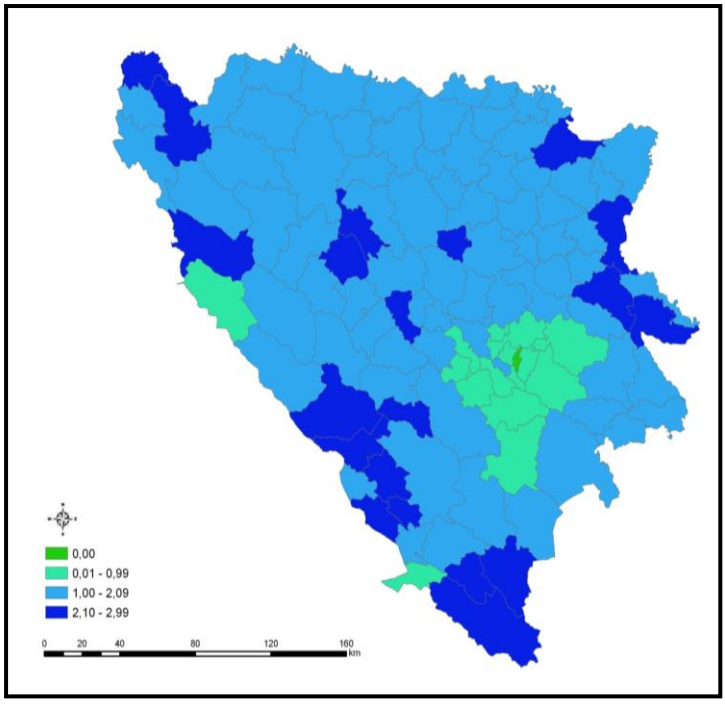


*Figure 3: Rural total fertility rates, Census 1991*

In 1991 in urban areas the percentage share of women with various educational attainments is somewhat different. Women with no schooling represented 12.2 per cent and most of them were aged 50 and above (81.5%), while women with completed primary and secondary schooling had shares of 37.8 and 38.1 respectively. University-educated women accounted for 10.0 per cent. The share of women aged 50 and above was smaller by increased educational attainment. So, 32.2 per cent of them were women educated only at primary level while 13.5 per cent and 14.4 per cent of them respectively were within secondary and university educated groups. The number of live births by female population with no schooling in urban areas was only 381 or 1.3 per cent. Women who had completed only primary school accounted for 8 417 live births or 29.1 per cent; 16 431 live births or 56.8 per cent were born by secondary-educated women and 3 219 or 11.1 per cent by women with university education (Table 4 and Figure 4).

*Table 4: Live births by mothers with different educational attainment, Census 1991*

| **Women by level of education** | **Area** | | |
|---|---|---|---|
| | **Municipality** | **Urban** | **Rural** |
| **No schooling** | 915 | 381 | 530 |
| **Primary schooling** | 29 417 | 8 417 | 20 752 |
| **Secondary schooling** | 28 978 | 16 431 | 12 378 |
| **University Education** | 3 877 | 3 219 | 646 |
| **Total** | **64 769** | **28 913** | **34 756** |

*Source: Author's calculation based on the data from the Agency for Statistics of Bosnia and Herzegovina and the Federal Office of Statistics of Bosnia and Herzegovina*

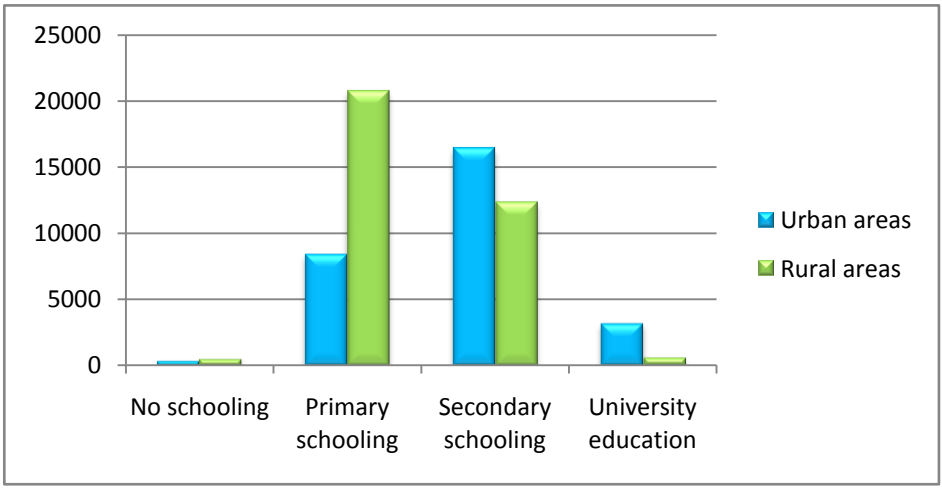


*Figure 4: Live births by mothers with different educational attainment, Census 1991*

## 4. Female Population by age according to educational attainment

An important concern is the age structure of females among each educational group. The situation is different at every educational level regarding the participation of women aged 50 and above, who usually do not participate in giving birth. In fact, 335 428 women (which is slightly more than 80 per cent) of those ages constituted female population who had no education. On the other hand, the situation is much different among females with primary and secondary education where women over 50 years of age accounted for 141 855 and 36 789 (20.8 per cent and 9 per cent) respectively. The smallest share was for those women with university education: only 10 271 or 2.5 per cent.

This educational age structure of women is a product of compulsory education and is notably different in comparison with the educational age structure in previous Census years. So, with no regard to place of residence (urban or rural) the number of women aged 15 to 30 years with no schooling comprised only 0.5% of the total female population and 2% of all women with no schooling. As the level of education increases until secondary level the number of women aged 15 to 30 is higher among the female population. So, women of those ages who completed primary education accounted for 35.3 per cent, whilst women with secondary educational level accounted for 54.5 per cent. Finally, university-educated women represented 24.0 per cent.

The female population with no schooling was mostly in the older age groups, as mentioned before. The smallest proportion of women with no education was aged from 15 to 30 years in both urban and rural areas. The number of live births was somewhat higher by mothers under 30 years old, than the number of live births by mothers aged from 30 to 49 years in urban areas while rural areas had the opposite situation (Table 6 and Figure 5). This can be considered as a consequence of the longer fertility lifespan of women in rural areas.

Women aged 15-30 years with completed primary schooling in urban areas account for only 26.1% of women in urban areas. The main reason for such a small share is that women mainly have increased their number of years of schooling and most of them have at least a secondary level of education. The number of live births by those mothers is notably high (76.0%). In rural areas the numbers of women with completed primary schooling in both age groups were similar, but the number of live births is much higher by younger mothers (Tables 5 and 6).

*Table 5: Female population by age (in %), Census 1991*

| Women by level of education (%) | Area | | | |
|---|---|---|---|---|
| | Urban | | Rural | |
| | 15-30 age | 30-49 age | 15-30 age | 30-49 age |
| **No schooling** | 3.0 | 13.3 | 1.9 | 15.6 |
| **Primary schooling** | 26.1 | 40.3 | 40.8 | 43.4 |
| **Secondary schooling** | 42.4 | 42.9 | 75.0 | 21.9 |
| **University Education** | 20.0 | 64.5 | 45.3 | 47.5 |
| **Total** | **28.9** | **40.0** | **32.2** | **29.7** |

*Source: Author's calculation based on the data from the Agency for Statistics of Bosnia and Herzegovinaand the Federal Office of Statistics of Bosnia and Herzegovina.*

In urban areas the percentage share of younger women as well as of older ones with completed secondary schooling is around 40%, with notably higher numbers of live births by younger mothers. The share of rural younger females who completed secondary schooling was much higher as well as the number of given live births. The higher percentage share of women aged from 30 to 49 years than the percentage of live births given by those mothers indicates that the duration of the period in which births occur declined by increasing level of mother's education. Among mothers with no education and mothers with primary or secondary education, the shortest fertility lifespan was for women with the highest educational level.

*Table 6: Live births according to age of mothers (in %), according to 1991 Census*

| Women by level of education (%) | Area | | | |
|---|---|---|---|---|
| | Urban | | Rural | |
| | 15-30 age | 30-49 age | 15-30 age | 30-49 age |
| **No schooling** | 56.7 | 38.3 | 45.7 | 52.8 |
| **Primary schooling** | 76.0 | 23.7 | 79.8 | 20.0 |
| **Secondary schooling** | 78.3 | 21.6 | 88.5 | 11.4 |
| **University Education** | 49.0 | 50.9 | 65.2 | 34.4 |
| **Total** | 73.6 | 25.7 | 81.8 | 17.7 |

*Source: Author's calculation based on the data from the Agency for Statistics of Bosnia and Herzegovinaand the Federal Office of Statistics of Bosnia and Herzegovina.*

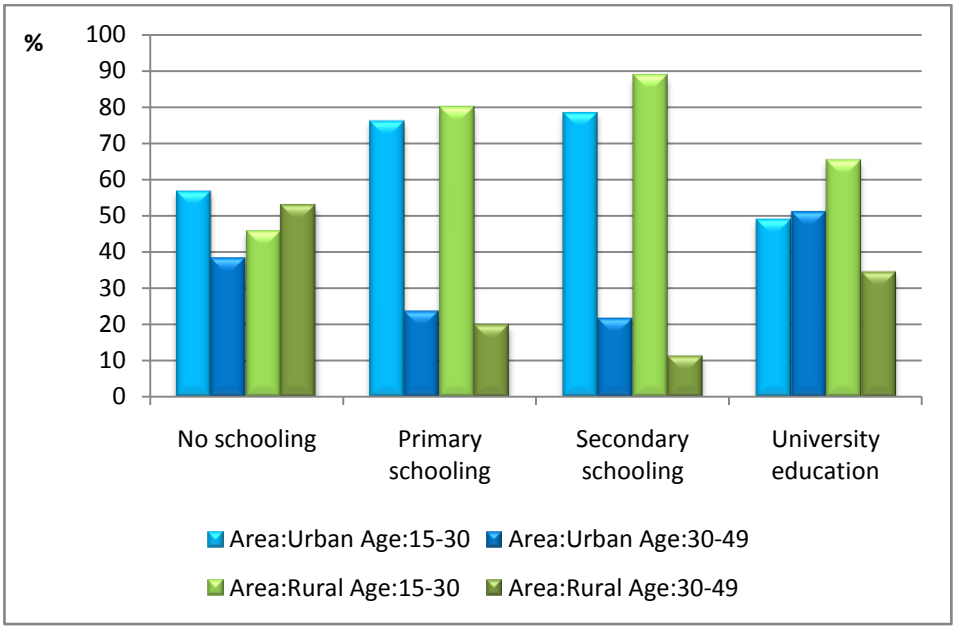


*Figure 5: Live births according to age of mothers (in %), Census 1991*

On the other hand, the university-educated urban female population aged from 30 to 49 years had a much higher share (64.5%) than those in younger age groups (20.0%), while the percentage share of both age groups of women with the same educational attainment in rural areas is almost the same. The higher number of university-educated women in the older age group is a consequence of the initiation and widespread launch of higher education in Bosnia and Herzegovina around two decades ago. It is also important to note that the number of these women was much higher among urban dwellers than among rural dwellers. So, the numbers of women (43 164) in the age group 30-49 who did receive tertiary education was more than seven times higher in urban than in rural areas (5 938). However, since educating women to the tertiary level continued to spread, the number of women aged 15-30 who had a rural place of residence was only around two times lower than the number of those women with an urban place of residence (5 659 and 13 379 respectively).

## 5. Conclusion

The data presented above show some differences in the proportion of urban and rural areas with respect to female schooling level and fertility rates. Total fertility rates vary across urban and rural place of residence generally, but higher fertility rates in urban areas in addition could be explained by taking into consideration the facts that during data gathering some settlements with semi-urban or even rural features were classified as urban areas.

In other words, the clear boundaries and criteria between urban and semi-urban settlements in Bosnia and Herzegovina do not exist so far. So, this situation also contributes to the fact that fertility is higher in urban than rural areas of Bosnia and Herzegovina.

On the other hand, the process of de-ruralization occurs ahead of urbanization, and rural populations situated in cities are connected in different ways with their place of origin, which is rural. So, necessarily these have some influence on the general demographic image of urban places, because some of its inhabitants maintain rural habits and type of family size as well as lifestyle.

In Bosnia and Herzegovina, as in almost all European countries, more educated women have the lower numbers of children ever born than are found among uneducated women. The country as a whole is characterized by falling fertility, but also by significant differences in fertility levels in urban and rural areas, influenced by differences in educational attainment. Both completed secondary and tertiary education tend to be associated with trends towards later age at marriage. In contrast with those who have only completed primary education, at the secondary level or above the relationship with fertility is always negative, and a marked decline in total fertility rates (TFRs) for women with higher levels of education is shown. Nevertheless, it is demonstrated clearly that for women with just a few years of education, there is little evidence of a systematic relationship between education and fertility.

There are several plausible reasons why women with education usually display a lower fertility than the uneducated. To summarize without pretending to produce a complete list of mechanisms, fertility desires have been thought to be affected by the individual woman's education because of several reasons:

- children's reduced contribution to domestic and agricultural work as a result of children's schooling, that might be encouraged by educated mothers;
- a stronger desire to spend more time caring for a child and to invest more in each child, not only in terms of education;
- educated women have greater economic power and gain more say in household decisions;
- the higher age at marriage among the better educated;
- women have more say in fertility, which they generally use to curb it;
- their knowledge about and acceptance of modern contraception, and their ability to use it efficiently, and also their more efficient use of traditional methods from the point view of better knowledge about their own body;
- women gain more equality and control over their own lives and control life options (e.g. marriage, divorce, sexuality, fertility patterns, freedom of movement);

- increased income controlled by women gives them self-confidence which helps them to obtain a voice in household decisions;
- the benefits of female education are enormously positive and affect the whole society (e.g. age of marriage, contraception, fertility, infant/child mortality, female paid modern sector employment, female earnings;

In sum, economically empowered females promoting their daughters` education comprise another effect that enhances development and national income growth, while freeing these daughters from a black future as ignorant "baby-making machines"(Blumberg,2005; King and Mason,2001; Cygan and Maeder, 2013; Testa, 2014).

After all, it is difficult to be sure whether the lower fertility of highly educated women can be ascribed to their education per se or to their other characteristics. However, it must be noted that education does not work in isolation to affect fertility. Indeed, increased education rarely occurs without concomitant changes to a society, as was the case in Bosnia and Herzegovina. The increase in educational attainment was followed by increased health services, enhanced communication, and better infrastructure that scaled down the difference between urban and rural living conditions. These factors occur but their effects cannot easily be disentangled.

## 6. Summary

This paper discusses the relationship between the level of education and female fertility patterns in Bosnia and Herzegovina. For the purpose of this study, data on the female population in the 109 municipalities that existed in the researched area in 1991 was analyzed. Due to the war and post-war events, the Census in Bosnia and Herzegovina has long been delayed, and it was finally held in 2013. However, given the complicated political situation, the results are not yet published and therefore the core questions and relations between the fertility and the education of the female population were reviewed and addressed based on the data of the last relevant Census held in 1991, which was compared to the previous Census held in 1981.

According to the 1991 Census, at the municipality level, women who had no education represented 25.8 per cent of the total; women who completed primary school had the highest share (42 per cent) of the female population, while those with completed secondary school represented 25 per cent. At the same time women with university educational attainment accounted for 4.9 per cent. The expected consequence is a low number of live births among the female population with no schooling: only 1.4 per cent of the total number of

live births, while the number of live births by mothers with primary or secondary education was increased and participation in the total number of live births reached 45.4 per cent and 44.7 per cent respectively, while the number of live births given by university educated mothers was 5.9 per cent.

At the same time, share of women with various educational attainments in urban areas is somewhat different, where women with no schooling represented 12.2 per cent and most of them were aged 50 and above (81.5%), while women with completed primary and secondary schooling had shares of 37.8 and 38.1 respectively. University-educated women accounted for 10.0 per cent. The number of live births by female population with no schooling in urban areas was only 1.3 per cent. Women who had completed only primary school accounted for 29.1 per cent; 56.8 per cent were born by secondary-educated women and 11.1 per cent by women with university education.

The analysis and discussion suggests that in Bosnia and Herzegovina, as in almost all European countries, higher educational levels are associated with lower fertility rates. The whole country is characterized by falling fertility, but also by significant differences in fertility levels in urban and rural areas, influenced by differences in educational attainment. However, it is difficult to determine with certainty whether the lower fertility of highly educated women can be ascribed to their education as such, because fertility rate is also associated with a group of other factors and characteristics of the observed population. Therefore, it is important to emphasize that the level of education does not act independently on the fertility rate. Indeed, increased education rarely occurs without concomitant changes to a society, as was the case in Bosnia and Herzegovina.

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