

EFFECTS OF EDUCATION ON BIRTH RATES IN ROMANIA

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Abstract

A growing share of Romania's female population is making increasing investments in human capital. These choices are to a certain extent affecting reproductive behaviour with repercussions on fertility levels at a national level. The aim of this paper is to assess the effects that tertiary education has on birth rates in Romania since the choice to invest in human capital tends to postpone the decision to reproduce. The method used to determine the influence between education and birth rates are of a statistical nature, using data collected from official sources. The expected results are of an inverse relationship between investment in human capital and birth rates and fertility levels.

Keywords: Birth rate, Tertiary education, Fertility, Population ageing

Clasificare JEL: C12, J11

1. Introduction

During the past few decades, Romania's demographic landscape has seen a slow decline in size and also in structure due to decreasing birth rates and a higher life expectancy, these transitions are generally referred throughout scientific literature as population ageing.

Another phenomenon that reflects and influences population ageing in current but also futures times is the decline in the fertility rate that plays an important role when discussing an intergenerational replacement.

These factors hold great importance when considering the social and economic aspects at a national level, in a country that is widely considered as an emerging nation [13].

One of the main reasons for the decrease in fertility and birth rates is the transition from an agrarian society to a service-based society, where a significant part is played by individuals personal goals, aspiration towards education and human capital development.

Human capital development is fundamental to a nation's wellbeing, contributing to a great extent to productive labour and economic growth. It is considered that education is one of the main factors that assist in achieving the goal of economic progress in current times where labour productivity is affected by disrupting factors.

Education is linked to increases in productivity, allowing workers to adapt better and understand emerging technologies and trend. Higher education also tends to affect fertility, mortality and income dispersal [6].

The effects that education has on birth rates and fertility rate have been intensively discussed in the literature, making it a relevant topic in research on reproductive behaviour [12].

The paper focuses on the influence that tertiary education has on woman's decisions in regard to postponing childbirth. The analysis of current fertility trends reveals that an important role is played by individuals intentions during the course of childbearing years since education is often seen as a modern form of contraception [15].

The expected results are a noticeable decline between the increasing percentage of women pursuing higher education and the decline in birth rates in Romania, as well.

2. Theoretical Framework

[12] have taken a comprehensive analysis of the effects that education has on fertility at a national level in Denmark taking into account direct and indirect contraceptive means, where two

of the most significant influences come from the desire to achieve financial independence and from the willingness to invest in human capital for future gains.

There is a significant difference between the quantity of children born and the age at which the first child is born considering different levels of education. Women that undergo high school educational programs tend to have more children and earlier than women that pursue a college degree [20].

With the increase in investments in human capital through learning, more highly educated women tend to have even fewer children. This phenomenon can be seen as a form of "reverse Darwinism" where the less educated members of society have more children.

There is an underlying assumption of the presence of an inverse relationship between higher status obtained through education and having fewer children in the case of highly educated women [14], [7], [11].

Gender inequality is an essential factor when considering the decline in total fertility since with a decline in inequality in the area of education, and with a rise in mean years of schooling for females there is a decline in fertility rates [8], [10].

The mean years of schooling for females is an indicator that is part of the Historical Index of Human Development (HIHD) published by the UN. The HIHD is defined as the "summary measure of average achievement in key dimensions of human development" where a rise in education through continuous investments in human capital is an important part [18], [2], [3].

When trying to understand the significance that the increase in the number of years spent in educational institutions plays on birth rates and fertility levels at a national level it is essential to look at how the mean years of schooling for females evolve in comparison to the total fertility rate.

The mean years of schooling for females refers to the "average number of years of education received by people ages 25 and older, converted from educational attainment levels using official durations of each level" [1], [19].

[4] states that "women that go to college or graduate school are unlikely to have even two children", the author goes on to state that in a sense these "this is kind of a reverse Darwinism where the traditional markers of success" are less likely to reproduce.

2.1. Educational attainment levels

A common denominator in assessing education levels at an international level is the ISCED or "International Standard Classification of Education", which is used as a statistical base to measure the educational attainment level. The indicator is structured on different levels with the aim of offering a common denominator for educational standards at a global level. Since its inception in 1997, the primary six levels have been expanded to eight levels in 2011, but mostly expanding upon the 5th level [17].

In 1997 the United Nations grouped education attainment levels through the ISCED using the following groups [16], [17]:

- Level 0 – "Pre-primary education" – focuses on the introduction of very young children to an organized learning environment designed to help develop cognition;
- Level 1 – "Primary education" – focused on providing basic reading, writing and mathematics to individuals between the ages of five and seven years old;
- Level 2 – "Lower secondary education" – the training present at this level is meant to enforce and complement training offered in the previous level;
- Level 3 – "Upper secondary education" – the training presented at this level focus on pupils that turn 15 years of age and are meant to develop on information presented on a lower level;
- Level 4 – "Post-secondary non-tertiary education" – The quality of training increases to prepare the participant for entry into the workforce;

- Level 5 – “First stage of tertiary education” – The programs in this group focus on proving higher level education comprised of training in that are found in professional qualification, Bachelor or equivalent and Master or equivalent;
- Level 6 – “Second stage of tertiary education” – The last class focuses on education that leads to an advanced research qualification, also known as Doctoral studies.

3. The effects of education on birth and fertility

With increasing requirements on behalf of society and heightened goals to overcome social norms and expectations, a growing number of women are making the choice to invest in a higher level of education. This increasing investments in human capital on behalf of women offers more avenues for productive work other than childrearing. The general acceptance is that, by increasing investments in human capital, there tends to be a decline in fertility rates.

Figure 1 presents the evolution of fertility rates per educational attainment levels as presented in the literature, compiled from publicly available data sources. For women that graduated in the ISCED 0-2 group, the recorded fertility rates are higher than all other groups, with a fertility rate of 2.03 children per woman in 2007 that gradually declined to a minimum of 1.79 children per woman in 2010. Between 2010 and 2014 the fertility rate for females in the ISCED 0-2 group rose to a peak of 2.24 children per woman.

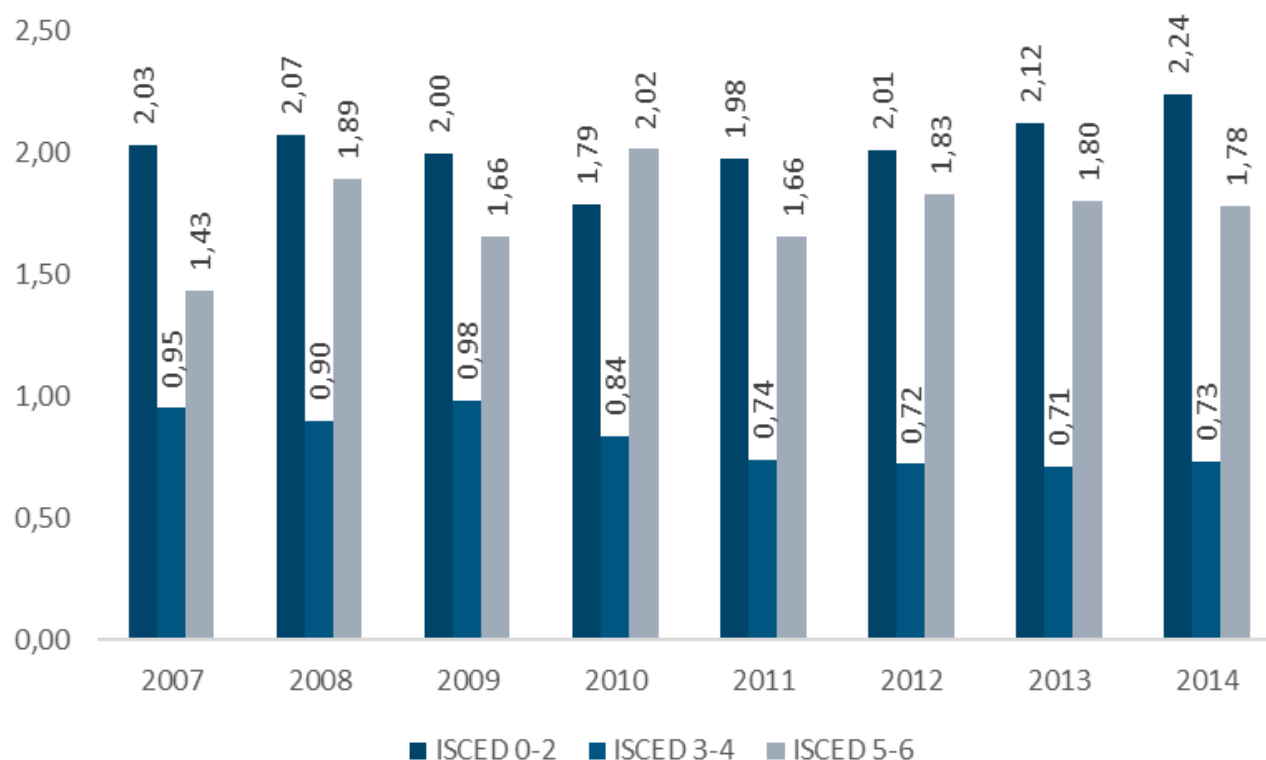


Figure no. 1. Fertility per female education attainment level in Romania between 2007-2014
Source: Own creation, based on EUROSTAT.

For the ISCED 3-4 group, the decline in birth rates is more considerable, starting at 1.43 children per woman in 2007 and gradually moving lower to 0.73 children per woman in 2014. These levels are alarming, indicating that women that undergo high school and other forms of short-term education are having much fewer children that trade school, or higher education. The reason being that the majority of women move on to superior levels of education or abandon educational goals, thus the low fertility levels.

The last group, ISCED 5-6, present overall fluctuations for the most part above the national mean recorded on a yearly basis. At the beginning of the period in question, the fertility rate was of 1.43 children per woman, this level increased to 2.02 children per woman in 2010 and slightly decreasing to 1.78 children per woman in 2014.

Figure 2 presents the evolution of live births by female education attainment level and the evolution of the educational attainment level for the population in Romania.



Figure no. 2. Population education attainment level and Live births by educational attainment level, in Romania between 2007-2017

Source: Own creation, based on EUROSTAT.

Based on the publicly available data published by Eurostat between 2007 and 2017, the education attainment level at a national level is presented in comparison with the share of live births by female education attainment level per ISCED standards. The aggregation for the live births by education attainment level encompasses all categories presented in the literature. As can be observed from Figure 2, as the education attainment level increase, there is a considerable decrease in the recorded birth rate. Between 2007 and 2009, the education attainment level increase from 65.2% to 66.5%, and live births gained from 214,728 live births to 222,388 live births.

Between 2010 and 2013, the education attainment level continued to increase after a slight decline in 2010, reaching a high point of 68.3%, while live births suffered a decrease to 188,599 live births. Between 2013 and 2017, the education attainment level climber to a peak for the entirety of the period of 71.6% in 2017, while live births fluctuated with increasing values, reaching 202,151 live births.

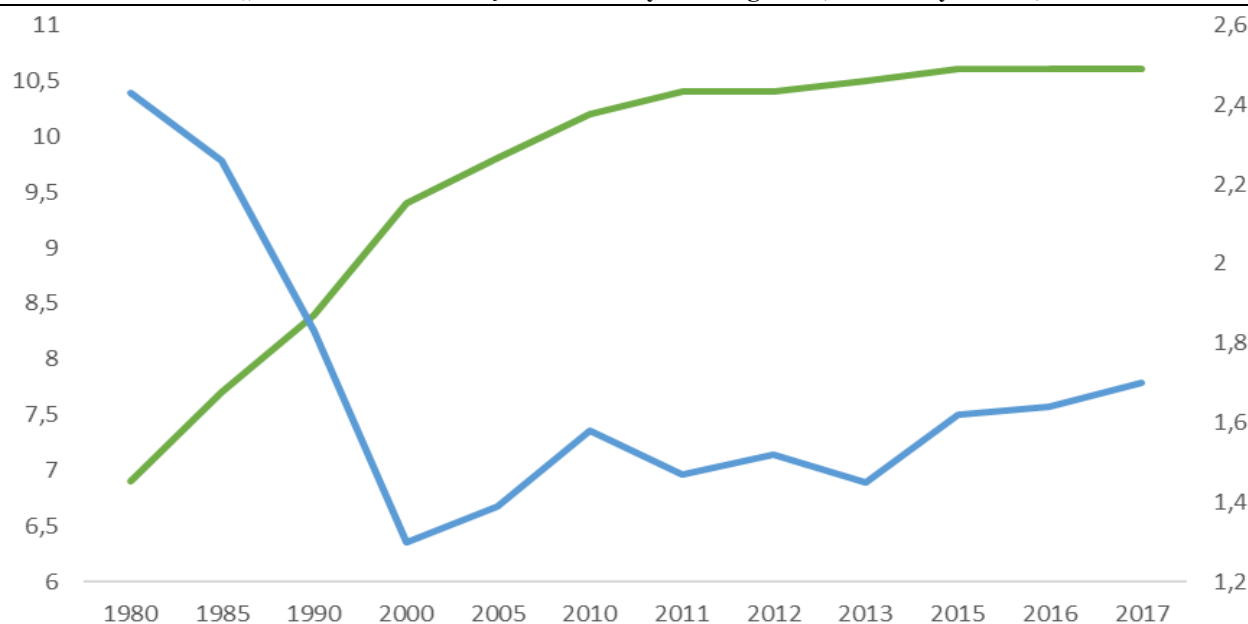


Figure no. 3. Mean years of schooling (females aged 25 years and above) and Total Fertility Rate, in Romania between 1980-2017

Source: Own creation, based on EUROSTAT and United Nations Human Development Reports.

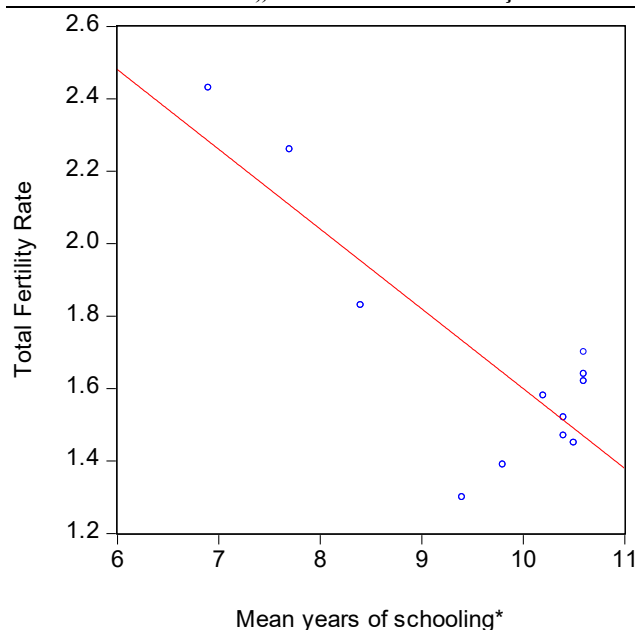
In the process of analysing the link between how education affects fertility, it is essential to review the relationship between the mean years of schooling for females and the changes in fertility over time.

Between 1980 and 1990, the mean years of schooling for women, grew at a steady pace from 6.9 years recorded in 1980 to 8.4 years in 1990. Between 1990 and 2000, the mean years of schooling for women increased to 9.4 years. This reflected the increasing tendencies on part of women to invest in human capital through education. At the end of the period in question, the mean years of schooling rose to 10.6 years.

The total fertility rate declined at an alarming rate from a value of 2.43 children per female in 1980 to a minimum value of 1.3 children per female in 2000. After this period a steady upwards trend can be observed with two highs recorded in 2010 of 1.58 children per female and 1.62 children per female in 2015. In 2017 the total fertility rate registered a value of 1.7 children per female.

To help offer more insight, a correlation analysis will be performed on the indicators presented above. The data for the analysis has been collected for the mean years of schooling as published by the United Nations in Human Development Reports, with the five years leaps between 1980 and 2010 and yearly data between 2011 and 2017.

As can be observed from Table 1, there is an inverse link between the two variables where an increase in the numbers of years spent in educational institutions by women tends to support decreasing levels in fertility levels. The results of the correlation analysis show a strong negative correlation of 0.8 between the mean years of schooling and the total fertility rate suggesting that with further increases in years spent in educational institutions on behalf of women a decline in fertility may occur.



Covariance Analysis: Ordinary

Date: 06/09/18 Time: 21:18

Sample: 1980 2017

Included observations: 12

<i>Correlation t-Statistic</i>	<i>Mean years of schooling</i>	<i>Total Fertility Rate</i>
<i>Mean years of schooling</i>	1	-0.81990
<i>Total Fertility Rate</i>	-0.81990	1

Table no. 1. Covariance Analysis between Mean years of schooling and Total Fertility Rate

Source: Own creation, based on EUROSTAT and United Nations Human Development Reports.

Increases investment in human capital through education tends to lead to decreases in the fertility rate since women tend to postpone giving childbirth in favour of pursuing more specialised training. A secondary phenomenon that occurs as education years increase is the decline in the number of children per women that tends to decrease further affecting the total fertility rate.

4. Conclusions

A core determinant of the demographic ageing process in Romania is the decline in fertility caused in part by the decision on behalf of women to pursue an investment in human capital through education.

This choice has a positive aspect on one side due to the improvements and contribution that it brings to society, but on the other side, it tends to affect fertility trends negatively, which will reverberate upon labour market and public pension [5].

When looking at how education attainment levels affect fertility rates, it is essential to note that for lower tier education, women tend to have more than two children, a level that is above the national fertility level of 1.7 children per female. In the case of mid-tier education, the fertility rate is relatively low, recording values of under one child per female and continuing to drop, the reason is that this is only a transitory stage to upper tier education where the fertility rate present a slight increase with values that hover around the national level.

Also, when looking at the education attainment level of the population and birth-rates over time, an obvious trend appears where the two move in divergent direction, thus even though education is the pillar of a productive society there seem to be consequences on the number of yearly live births.

Finally, the existence of a negative correlation between the mean years of schooling and fertility give more evidence to the impact that education has on Romania's demographic future.

A new approach has to be taken at a national level to help increase fertility through other channels and try to correct as much as possible current trends. Thus, the best approach would be in the case of highly educated women to give way to raising and offering assistance to fewer children to be happier and more productive members of society[9].

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