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GDP Growth and Fertility Decline - A Causality Evaluation for Albania

Marsida Abdul ¹

¹PhD candidate, Lecturer, Department of Statistics and Applied Informatics, University "Aleksandër Moisiu" Durrës, Albania

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Abstract: For years an extensive literature has supported the idea that economic development causes fertility declines in many countries. The economic and social impact that lower fertility has on demographic and macroeconomic variables raises the need for thorough analysis, and policy implications. However, recent studies have also shown that fertility rates can increase during economic development, if certain conditions are met. For this reason, in this paper we have evaluated to what extent the fertility declines in Albania during the last decades, was caused by GDP growth. Using the Toda-Yamamoto approach the results show that there is a causality effect between these variables. Therefore, policymakers should explore methods to enhance fertility, aiming for long-term demographic and macroeconomic stability.

Keywords: fertility, GDP growth, Albania, economic development, Toda-Yamamoto method.

Introduction

The relationship between economic development and fertility has received significant attention in demographic and socioeconomic research. The negative effect of economic development on fertility is due to the fact that with economic growth, the economic position of women in society also improves and their social perspective changes, which leads to a decrease in births, and consequently to a



decrease in the population. In countries where women's empowerment is higher, as analyzed by Mubeen et.al. (2022), decision-making authority, access to education, and access to economic resources will significantly influence fertility preferences. Sobotka (2004) highlights this phenomenon by linking it to societal shifts characterized by the postponement of childbearing, driven by improved education and employment opportunities for women. This suggests that as women gain autonomy and access to resources, their reproductive choices evolve, often leading to lower fertility rates. This echoes the results from Butz and Ward (1979) who showed that the increase in women's participation in the labor force combined with the increase in average hourly wages and total family income will lead to a decrease in the number of children per woman.

In an analysis of fertility levels across EU countries, the Russian Federation, and Eastern European nations, Kohler, Billari, and Ortega (2006) conclude that countries experiencing prolonged periods with fertility rates below 1.3 – classified as "lowest low" – are likely to face a population decline of nearly 50% within the following 45 years. Beyond the overall population decrease, the study highlights the negative demographic consequences associated with these low fertility rates. It also points out that, in many of the analyzed countries, this decline results from fewer children per family, decisions to remain childless, or the postponement of childbirth. Consequently, some countries have opted to implement one or more pro-natalist policies aimed not only at increasing the average number of children per family but also at encouraging young people to choose parenthood. According to Adema et al. (2015), the potential benefits of these policies are substantial. Paid parental leave for both mothers and fathers, as well as subsidized childcare, contribute to economic growth, support increased female labor force participation, provide physical and mental health benefits for children, and expand parents' options to balance family, work, and personal development.

Another optimistic premise is based on the analysis of the Human Development Index (HDI). Previous studies widely accepted that increases in human capital would lead to fertility decline. However, a study by Myrskylä et al. (2008), covering 143 countries over 1975–2005, revealed a more complex relationship. It was observed that at advanced levels of the HDI, the association with fertility turns positive, resembling a "J"-shaped curve. This suggests that further increases in HDI beyond a threshold of approximately 0.86 may actually raise fertility rates, a phenomenon previously considered unlikely since all countries experiencing economic and human development had also undergone fertility declines and slowed population growth. This shift in fertility as a result of sustained economic and social development has the potential to slow down population decline and aging trends, thereby alleviating social and economic challenges linked to very low fertility levels.

Therefore, given that some models, such as in the study by Adsera (2004), have forecasted not only fertility decline but also its postponement to later ages, future analyses do not exclude the possibility that we may be approaching a global fertility increase threshold.

Fertility Rate in Albania

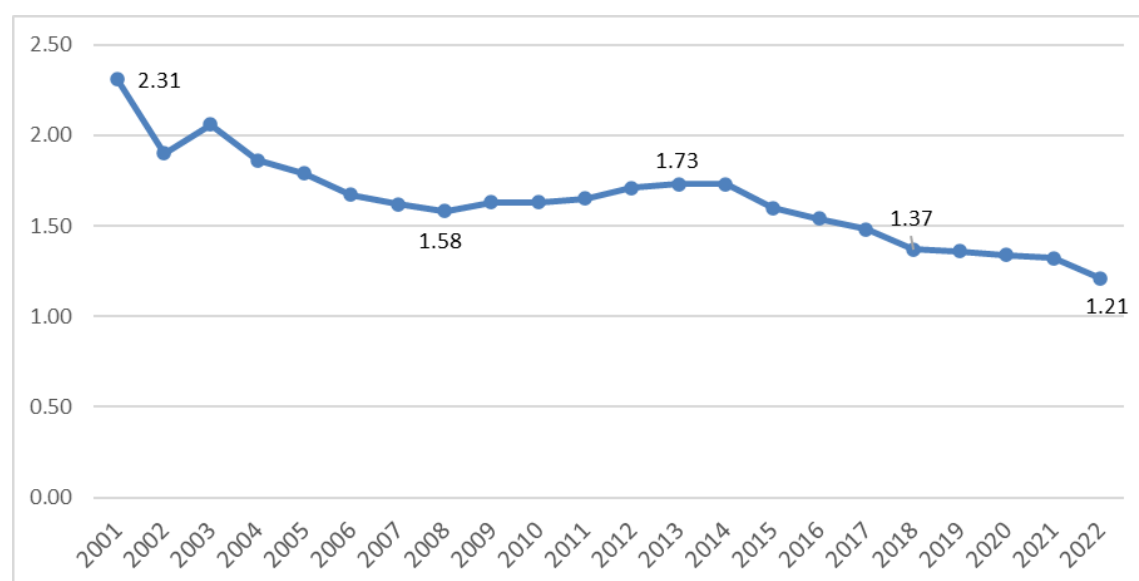
The declining fertility indicators in Albania over recent years motivate further analysis and empirical investigation. The following review of fertility and related variables forms the basis for the empirical analysis conducted.

The reciprocal relationship between fertility and economic development in Albania, as in many other countries, is a complex issue. This complexity stems primarily from the nature of the variables themselves, which can only be fully understood within a long-term context. Another limitation arises from latent factors influencing both fertility and economic development. These variables are deeply affected not only by microeconomic and macroeconomic factors but also by psychological, social, and political dimensions, the inclusion of which in the analysis presents additional challenges.

Data from Albania's Institute of Statistics (INSTAT) clearly show a continuous decline in births and fertility rates, representing a problematic trend with long-term implications. The Total Fertility Rate (TFR) falling below the replacement level of 2.1 indicates that Albania's population is likely to decline in the coming years. As supported also by birth data, since the early 1990s fertility rates in the country have steadily decreased. [Figure 1] below presents the TFR values for Albania from 2001 to 2022.

Figure 1

Total Fertility Rate in Albania during 2001-2022



Source: INSTAT Database, author's calculations

Such persistently low fertility rates underscore the urgent need for detailed analyses of the situation, enabling the development of effective policies.

In addition to the reduction in births mentioned above, another relevant indicator is female labor force participation. INSTAT data show that between 2003 and 2022, not only has the number of women in the labor force increased, but also the proportion of women relative to the total labor force has grown, approaching 50 percent—effectively half. Furthermore, improvements have been observed in the gender wage gap and the Human Development Index (HDI), which in 2021 stood at 4.5% and 0.79,



respectively. According to UNDP (2022), Albania experienced an increase in HDI from 0.67 in 2000 to 0.79 in 2022 during the post-transition period. Based on the study by Myrskylä et al. (2008), this ongoing economic and social development, particularly among the youth, may represent an opportunity to reverse the downward trend in fertility rates.

Further, the analysis of education data as a key human development indicator, reveals high participation rates of girls and women in education. [Table 1] below illustrates the share of graduates by gender for each year.

Table 1

The percentage of graduates by gender for the years 2015-2024

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Female	64.3%	63.8%	64.2%	63.3%	66.4%	65.3%	66.1%	66.3%	65.2%	65.8%
Male	35.7%	36.2%	35.8%	36.7%	33.6%	34.7%	33.9%	33.7%	34.8%	34.2%

Source: INSTAT Database, author's calculations

Therefore, it can be expected that in the coming years the gender wage gap will continue to narrow, female labor force participation will keep increasing, and women's HDI will further improve, thereby raising the overall national HDI. Under such conditions, it is possible that fertility and birth rates in Albania could increase, even amid periods of economic growth.

Research Aim and Research Questions

The above data analysis and literature review, serve as both a foundation and motivation for further analysis of the relationship between economic development and fertility in Albania. As widely acknowledged, a persistently low fertility rate has significant long-term effects not only on demographic indicators such as median age and dependency ratio but also on macroeconomic factors including workforce size and unemployment. Therefore, the primary objective of this paper is to provide empirical evidence on this relationship to support policymakers in making informed decisions aimed at encouraging fertility, thereby fostering more sustainable economic and social development.

To achieve this, we test for causality between economic growth and fertility using the Toda-Yamamoto methodology, as recommended by Boz and Ozsari (2020), Mishra and Mishra (2019), Akin and Aytun (2016), among others. Through this approach, we aim to answer the research question: *To what extent does economic growth predict changes in fertility behavior in the long run?*

Research Results

This study applies the Toda-Yamamoto (TY) approach to examine the causal relationship between economic growth and fertility rate. The time series data used in this model were obtained from the World Bank's World Development Indicators (WDI) database, accessed in December 2024. The dataset includes annual observations on the fertility rate (births per woman) and GDP growth (annual %) for the selected country, covering the period from 1993 to 2021.



First, we tested for stationarity using the Augmented Dickey-Fuller (ADF) test, which is a prerequisite for determining the maximum order of integration required for the TY procedure. Both fertility rate and GDP growth were found to be stationary at level, so no differencing was required.

Subsequently, the optimal lag length for the unrestricted Vector Autoregressive (VAR) model in levels was determined using standard information criteria (AIC, BIC, and HQC), all of which consistently selected a lag order of two. This lag structure was then employed in the estimation of the VAR model and the execution of the Wald test to assess Granger causality. The estimation results from the VAR(2) model demonstrate a strong model fit, with an adjusted R-squared value of 0.9969 in the fertility rate equation and no evidence of residual autocorrelation (Portmanteau test p-value = 0.5653).

Within the equation for fertility rate, the GDP growth variable was found to be marginally significant ($p = 0.077$, significant at $\sim 10\%$ level), suggesting a potential influence. The Wald test showed on [Table 2], applied to jointly test the null hypothesis that all lags of GDP growth have no effect on fertility rate, yielded a chi-square statistic of 3.9475 with a corresponding p-value of 0.0469.

Table 2

Toda-Yamamoto Wald test for Granger causality

Test	Value
Test type	Wald test
Null hypothesis	Regression parameters for GDP_growth are zero
Variable tested	GDP_growth
Chi-square (df=1)	3.94749
p-value	0.0469415

Source: author's own development

This result leads to the rejection of the null hypothesis at the 5% level, providing statistical evidence that GDP growth Granger-causes fertility rate in the long-run. In other words, historical values of GDP growth contain predictive power over changes in the fertility rate, highlighting the dynamic interrelationship between economic performance and demographic behavior.

Conclusions

As a conclusion we can say that the literature revised supports the idea that economic development causes fertility decline. Nevertheless, studies that have incorporated additional variables, such as HDI, show that there might be opportunities in the future for fertility increase even during economic development periods.

Regarding the case of Albania, the data show that the "lowest low" level of fertility during the last decade, calls for thorough analysis and carefully designed policies.

Empirical results prove that there is a causality relationship between economic development and fertility in our country. Thus, policy makers should look for alternative methods to stimulate fertility, in order to achieve long-run stability of the demographic and macroeconomic variables.



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