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Demographic transition, education and economic growth in Tunisia

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ABSTRACT

This paper provides empirical evidence supporting the interaction between fertility, education and economic growth through the underlying mechanism behind that correlation in accordance with Becker's theory. In consistency with the theory, the key explanatory variables in Tunisia's fertility model are real GDP per capita, infant mortality, contraceptive use ratio, and education. As opposed to most empirical works, the present study takes into consideration three educational levels, i.e., primary, secondary and higher. Also unlike most empirical research, this study attempts to analyse the impact of fertility transition on education and economic growth. To deal with too little or incomplete data, time series data for Tunisia are computed over 45 years. A multivariate cointegration analysis is carried out and shows that a long-term triangular relationship exists. A short dynamic run analysis based on the vector correction error model displays results in coherence with and close to those of the long term. Among our key results, education is found to trigger fertility transition both in the short and long run. In addition, education has relatively fostered economic growth but hardly boosted it through its dynamic interaction with fertility. Furthermore, the variance decomposition and the impulse function show that the fertility transition has produced a feedback effect on both education and economic growth.

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1. Introduction

In the literature, the link between demographic transition, human capital accumulation and macroeconomic performance has continuously been emphasized.[1] The term demographic transition describes the change that occurred from pre-industrial high fertility and mortality to post-industrial low fertility and mortality observed along economic development. Demographic transition is often believed to foster economic growth.[2]

In particular, the New Household Economics theory claims that the interaction between fertility and human capital accumulation leads to demographic transition and incites economic growth.[3] Education may participate in declining fertility rate because it vehicles values in favour of socioeconomic advances in contrast to traditional ones.[4] Human capital has also been found to affect demographic and economic growth through diverse channels. The most familiar channel, however, is related to the child quantity–quality trade-off within households (Becker, 1960) as well as gender. Accordingly, education is expected to raise wages and consequently motivates great concern with high child quality. Besides, it is assumed to boost the "price" of child quantity through increasing the opportunities cost of time devoted by women on child care (in terms of foregone labour force participation). Moreover, as the household decisions moved away from child quantity to child quality, a remarkable decline in population growth took place. An even more important channel works through the human capital return on technological progress. Indeed, the choice made by parents concerning child education affects the pace of technological progress. For example, an augmentation in human capital accelerates technological progress, which in turn raises the human capital return and thus induces the substitution of child quality for child quantity characterizing demographic transition. Another channel is through the negative education effect on mortality. Finally, human capital accumulation is one of the prime engines for economic growth as a major production factor.

In addition, human capital accumulation can indirectly spur economic growth through accelerating demographic transition. Indeed, demographic transition affects the economic performance of a country in a number of ways. During the transition, households are more willing to reduce the number of children in order to foster education and ensure better human capital for the few remaining children. Therefore, they accumulate more human capital, which accelerates economic growth. Moreover, the fertility decline lowers the dependency ratio and increases the proportion of the working age population and, consequently, the availability of economically productive time. These changes have a great impact on economic growth (Nerlove and Raut, 1993). Besides, a low population growth reduces physical capital sharing among individuals and increases income per capita.

Demographic transition in Tunisia was fast. Over the last five decades, the population rate decreased to a low and stable level of around 1.18 percent, while fertility fell down to the population replacement threshold. Meanwhile, education development and economic growth were prompt. The schooling rate of the age group 6–11 rose from 29 percent to 97.7 percent and the GNP rose from about 87 to 5048.6 dinars per capita. Tunisia presents a successful example of demographic evolution and education generalization which will provide some insights about Arabic developing countries in the MENA regions. Similarly, the case is of interest in regard to the lack of related quantitative analyses. Did education change fertility behaviour and thus contribute to the demographic transition? Does a long-run causal triangular relation exist between fertility, education and economic growth? Did Tunisia benefit from the economic opportunities of the demographic transition?

In accordance with Becker's theory, the present study empirically tests the interaction between fertility–education and economic growth through the underlying mechanism behind that link. The paper does not aim at analysing the education–fertility interaction. Rather, it seeks to investigate the link between demographic changes and macroeconomic performance through analysing the education–fertility interaction. The paper aims at providing explicit evidence justifying the dynamic

[1] E.g., Galor and Weil (2000), Tamura (2002), Kalemli-Ozcan (2002), Hansen and Prescott (2002), Doepke (2004) and Cervellati and Sunde (2005).
[2] For example, for North Africa, see Bloom and Canning (1999) and Bloom et al. (2003).
[3] Becker et al. (1990) and De la Croix and Doepke (2003).
[4] Schultz (1969, 1985), Becker (1960, 1992), and Easterlin (1996).