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The Role of Socio-political and Economic Factors in Fertility Decline: A Cross-country Analysis

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Summary. — In this paper, we have examined the fertility transition across countries in four different income categories from social, economic, political and population policy perspectives. We examine whether and how social, economic, political and population policy factors contribute to the decline in fertility rates in countries with different income levels, and our findings suggest that these factors can have very different effects on fertility rates in these countries. Political freedom is found to play a role in shaping people's perceptions of fertility and has different effects on fertility for countries in different income categories. Worsening political freedom in Upper Middle-income countries exerts downward pressure on fertility rates, while it contributes a positive effect to fertility rates in Lower Middle- and Low-income countries. Urbanization, if implemented successfully, can be an effective approach to further reduce the fertility rate for countries with lower income levels and higher rural populations. Population policies, measured by the contraception prevalence rate, have been found to be effective in reducing the TFR in Upper Middle-income, Lower Middle-income and Low-income countries. From the intra-country analysis, population policies are confirmed to be the main tool used by China and Bangladesh to cut down their TFR. Human capital is confirmed to be one of the most important determinants in explaining the decline in fertility rates across all income categories. The significant policy implication of these findings for policy makers in those Lower Middle-income and Low-income countries is to invest more in education which can have a notable impact on people's perceptions of fertility, and eventually this could help to effectively reduce their fertility levels in a more natural way than could be achieved by aggressive population policies.

Key words — political freedom, total fertility rates, population policy, human capital, urbanization, contraceptive prevalence rate

1. INTRODUCTION

Countries across the world have experienced a steady and continuous decline in the fertility rate (e.g., Van de Kaa, 1987). The decline in fertility has been evident in both high-fertility regimes as well as low-fertility regimes during 1950–2005 (Strulik & Vollmer, 2013). For example, Central and Eastern European countries experienced a rapid decline in fertility from having one of the highest levels to one of the lowest levels in Europe (Sobotka, 2004).

The dynamics of the fertility transition have been examined primarily within an economic framework. Even though the modern approach to fertility, both from a Malthusian and a neoclassical growth model, leads to very distinctive relationships between economic growth and population growth, they both support the view that there is a correlation between economic growth and fertility trends (e.g., Becker, Murphy, & Tamura, 1990; Deardoff, 1976; Fanti & Manfredi, 2003; Samuelson, 1975). A number of researchers have examined empirically the effects of population growth and fertility on economic growth (e.g., Barlow, 1994; Hondroyiannis & Papapetrou, 2000). Strulik and Siddiqui (2002) suggested "the existence of a critical level of per capita income above which fertility decreases exponentially with rising income". An inverse relationship between income per capita and fertility among countries and across households is commonly observed (Schultz, 2005). Economic convergence in Economic Co-operation and Development (OECD) member countries has been suggested to be linked to the fertility transitions (Dalgaard & Strulik, 2013).

Undoubtedly, there are other factors that have also contributed to the noticeable disparity in the fertility transitions around the world over the years (Reher, 2004). The effect on fertility of *mortality* reduction is another important mechanism being used by researchers to study demographic transitions (Tamura, 2006). In the recent and increasing amount of literature on demographic transitions, researchers (e.g., Azarnet, 2006; Falcao & Soares, 2008; Largerlöf, 2003) have used mortality reduction to explain demographic transitions, based mainly on the rationality of the seminal work of Becker and Lewis (1973), which is the trade-off between the quantity and quality of children. Angeles (2010) showed that "mortality plays a large role in fertility reductions". Falling mortality risk is found to be strongly positively correlated with falling fertility (Murphy, Simon, & Tamura, 2008). Another factor that has been identified as having an impact on fertility is *educational level*. Amin and Behrman (2014) find a strong association between years of schooling and fertility, and they highlighted how increased schooling causes women to have fewer children and to delay childbearing. Companionship and altruism have been assumed to be the main forces motivating parents in guiding their fertility and human capital investment (e.g., Becker & Barro, 1988). Ehrlich and Lui (1991) demonstrated that any increase in the *life expectancy* of the parents, who rely on their children for material support, would lead to an increase in the educational investment in

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their children as well as a reduction in fertility. Urbanization has long been identified as a social structural change associated with fertility transition in demographic transition (e.g., Thompson, 1930), and the fertility rate has been found to decline with *urbanization* (e.g., Sato & Yamamoto, 2005).

Recent studies have found that political transition in both the Czech Republic and Slovakia, from centrally planned to market oriented economies, have had a negative effect on the fertility rate (e.g., Klasen & Launov, 2006). The relationship between economic and political components has been discussed in previous studies (e.g., Burke, 2012), and they are often connected. For example, the decisions of political leaders can influence the economy, just as economic growth can influence the fate of political leaders (Jones & Olken, 2005). However, there are few researchers who have included political components, [1] such as political rights and civil liberty, in the study of demographic transition.

This paper makes several contributions to the existing literature. First, most existing studies have used mainly *mortality, life expectancy, urbanization, educational level* and economically related variables to explain the changes in fertility. As the change in fertility rates has been found to have a significant association with economic growth (e.g., Burke, 2012), the intimate relationship between political freedom and economic freedom could suggest that it may be important to take into consideration the political dimension in the study of fertility. Political discrimination in education provision between black and white people was found to have significant impacts on fertility and human capital accumulation for blacks (Tamura, Simon, & Murphy, 2014). Some countries have experienced dramatic changes in their political freedom measured by political rights and civil liberty. [2] This paper investigates whether there are any effects on fertility from changes in the statutes of a country's political freedom.

The second contribution of this paper is that we have used the index for human capital per person to measure the educational attainment of the entire population and returns to education, rather than including the years of schooling of only certain groups of people, such as female schooling, which is commonly used in fertility studies (e.g., Gries & Grundmann, 2014). The index for human capital captures both years of schooling and likely returns from investing in education. In the business world, human capital is considered to be the economic value of an employee's set of skills; to policy makers, it is the capacity of the population to drive economic growth (World Economic Forum, 2013). Hence, changes in human capital could have implications for policy makers in their decision making, for example on population policies or even on university funding. This could have impacts on people's decision making on whether or not to have an additional child when considering the cost and benefits of having more children. Berry and Glaeser (2005) indicated that cities with higher levels of human capital attract highly-educated labor, which contributes to the rapid population growth in such cities. However, Lehr (2003) indicated a negative relationship between returns to education and fertility. The more highly-educated households seem to take any expected future returns to education into consideration when deciding upon family size.

The third contribution of this paper is that we have studied the effects of population policies on fertility by using the contraceptive prevalence rate [3] as a measure of people's response to population policies. Population policies, such as birth control policies aimed to reduce high fertility rates have been hugely successful at reducing the same from the historically unprecedented high fertility rates of the 1970s to a modest growth rate in the 2000s for most Upper Middle-income countries. However, cross countries' analysis on the effects of different population policies employed by different countries on fertility rates can be very challenging as (1) some countries' population policies are implemented on a voluntary basis with governments almost unanimous in their support for methods of contraception, but without coercion or abortion, while other countries' population policies are implemented with heavy-handed methods; and (2) when the population policy itself is not quantifiable, then it can be very challenging to quantify its effects on fertility rates at a macro-level. Hence, micro-level studies, and country-specific evidence methods are preferred by some researchers (Lee, Lush, Walt, & Cleland, 1998). The contraceptive prevalence rate may be a solution to address these challenges as a sharp increase in the use of contraceptive methods has been widely observed in many developing countries, such as China, immediately after the introduction of their population policies. In urban areas, an almost total compliance with China's one child policy was ensured by the heavy-handed methods employed by the Communist Party (Aird, 1994). People needed to use appropriate contraceptive methods to prevent unwanted pregnancy, either to maintain their lifestyle or to comply with population policies.

The fourth contribution of this paper is that we not only examine the mean effect by using a fixed effect model, but we also examine the effect at different quantiles by using a quantile regression model (Koenker & Basset, 1978). This allows us to study the impact of explanatory variables on the entire fertility distribution.

2. DATA AND VARIABLES

We measured our dependent variable fertility with the *total fertility rate* (TFR). *Political freedom* (PF_i) means freedom from oppression. Political freedom consists of two basic components: Political Rights and Civil Liberties (Aixalá & Fabro, 2009). Political freedom, for example, empowers people with constitutional rights to choose their leaders and determines how much say they could have on government policies. In some extreme cases, political freedom may determine how many children a couple could have or choose to have. We have used an average of Political Rights ($PR_{i,t}$) and Civil Liberties ($CL_{i,t}$) to measure a country's level of political freedom. *Economic wellbeing* ($ECWELL_{i,t}$)is measured by the ratio between GDP per capita and household final consumption per capita. [4] The ratio tells us the change in economic conditions of a household. For example, an increase of the ratio indicates an improvement of a household's economic condition as more money is disposable after household consumption of items defined by the World Bank.

Our sample covers 70 countries in four income categories from 1973 to 2011. Data on the contraceptive prevalence rate, which is used to measure people's responses to population policies—denoted as $POPUY_{i,t}$, are taken from multiple sources. [5] Data on the contraceptive prevalence rate cover time periods during 1983–2011. As the data on the contraceptive prevalence rate are sporadic, we have conducted a smaller scale study of 25 countries to examine the effectiveness of population policies on reducing the TFR, and to test the robustness of other variables used in this study. Data for all variables used in this study are yearly data. The summary statistics for our panel data are provided in Table 1. In the Appendix, we have included a brief description of our dataset and its source (Table 4), detailed information on methodolo-

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