



# Crime, fertility, and economic growth: Theory and evidence



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## ABSTRACT

This paper studies the link between crime and fertility and the way by which they jointly impact on economic growth. In a three-period overlapping generations model, where health status in adulthood depends on health in childhood, adult agents allocate their time to work, leisure, child rearing and criminal activities. An autonomous increase in the probability offenders face in escaping apprehension, increases both crime and fertility non-monotonically, giving rise to an ambiguous effect on growth. A cross-country empirical examination, based on data that span four decades, supports the non-linear effects on both crime and fertility. At the same time, it reveals a negative effect on output growth.

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## 1. Introduction

It is well-recognized that criminal activity can influence the pace of economic growth. The channels of transmission include, but are not limited to, a direct rise in the cost of doing business, a decline in competitiveness, a discouragement of foreign investment, a diversion of (private and public) funds towards crime prevention activities that reduce productive capacity, and a limited investment in human capital accumulation. At the same time, the unified growth theory has emphasized the role of fertility and demographic transition, more generally, as an important element of the transition in economic growth regimes. The economic growth literature, however, has treated crime and fertility considerations as independent and unrelated drivers of the growth process. This is so, despite the observed positive association between population growth and crime both at the city and country levels. To account for this stylized fact, in this paper, we build a unifying framework where we examine the link between crime and fertility and, subsequently, their joint influence on economic growth. This link is offered by the probability of crime apprehension, or inversely, the likelihood of escaping criminal arrest.

There is a long-established relationship between the probability of apprehension and criminal outcomes. The seminal contribution by [Becker \(1968\)](#) postulates that a rational individual's decision to engage in criminal activities is a function of

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the expected returns to crime and the returns to legitimate market opportunities. Optimizing agents have a higher incentive to participate in criminal activity when the financial rewards from crime exceed those obtained from legal work. According to Becker (1968), this would be the case in response to a lower probability of apprehension and conviction, a less severe punishment, and lower legal real wages, other things equal. More recently, Imrohoroglu et al. (2004, 2006) and Engelhardt et al. (2008) by calibrating their models to U.S. property crime data, have stressed that the most important factor for observed changes in crime rates is the apprehension probability. This finding has also received strong empirical support both for the U.S. and across countries. Many studies have shown that increases in the probability of apprehension and punishment, achieved by greater government expenditure on security or a greater number of security officers, decreases the expected return of crime and, therefore, crime (Corman and Mocan, 2000; Levitt, 2004; Di Tella and Schargrodsky, 2004; Evans and Owens, 2007; Draca et al., 2011; Harbaugh et al., 2011). It is, therefore, the conviction of this line of studies that the likelihood of arrest influences economic growth via its effect on crime rates.

From the perspective of development theorists, central role in economic growth is played by fertility decisions. According to them, a demographic transition represents the underlying mechanism of the passage from a near-zero steady state growth regime to a positive steady state growth regime. The mechanism that allows for this transition dates back to Becker (1960) and features the quantity–quality trade-off for children. The trade-off derives from the assumption that parental utility is a function of both the number of children and of their education or human capital. Since both rearing and educating children are costly, a trade-off between these two activities arises. In this environment, a decline in mortality makes investment in children's human capital more attractive, leading parents to substitute child quantity for child quality. The simultaneous accumulation of human capital and decline in fertility provides a link between transitions in demography and growth. Various versions of this argument have been developed by Galor and Weil (1999), Kalemli-Ozcan (2003) and Falcao and Soares (2008). More recently, Bhattacharya and Qiao (2007) and Agénor (2009) have considered human capital development as a function of investments in health.

This paper jointly studies the connection between crime rates and fertility rates. It then examines the way via which these two variables affect economic growth. In this way, the analysis offers a combination of the two above-mentioned literatures. Thus, this paper can be thought of as combining two pioneering works of Becker (1960, 1968) to illustrate that crime and fertility outcomes are jointly determined by the probability of avoiding apprehension. This is done by developing a theoretical framework and by testing empirically its implications.

To the best of our knowledge, the only study that has tried to (empirically) establish a link between crime and fertility is Gaviria and Pagés (2002). Using crime victimization data for 17 Latin American countries they suggest that higher population growth at the city level raises crime victimization rates. They interpret this finding as being causal, hypothesizing that higher city growth diminishes the effectiveness of law enforcement institutions. Our study, in turn, finds this positive relationship not to be causal but rather an equilibrium outcome stemming from the lower effectiveness of law enforcement, as this is proxied by the higher probability of criminals escaping apprehension.

Our theoretical model comprises two basic relationships. The first relates the probability of escaping apprehension to the level of crime. The second connects the probability of escaping apprehension to child-bearing decisions. In this way, the model illustrates the idea that crime rates and fertility rates are endogenously determined. Their relationship depends on the way the individual (time allocation) and the institutional factors (probability of arrest) that determine outcomes on an individual level, aggregate across the population.

The model contributes to the literature by generating three important results. First, by identifying a non-linear effect of escaping the probability of arrest on criminal activity so that the likelihood of escaping apprehension has a positive effect on crime only after a critical probability threshold. Second, by illustrating that fertility responds positively to higher values of the probability of escaping arrest. Third, by showing that the effect of the apprehension probability on economic growth is ambiguous.

The predictions of the model are then subjected to an empirical evaluation. The empirical analysis considers up to 90 countries with the use of panel data for the period 1970–2008. The methodology utilizes both reduced form estimations and joint estimations of the crime, fertility and growth equations. Our results offer support to the theoretical implications as they show a non-monotonic effect of the likelihood of escaping arrest and conviction on crime, with the effect turning positive above a probability in the range of 10–30 percent. Above this threshold value, we also find evidence of a positive impact of the probability of escaping apprehension on fertility. Further, the effect of this probability on growth is negative, corroborating the studies that document a negative relationship between crime and economic performance.

The remainder of the paper is organized as follows. Section 2 presents the theoretical analysis, setting out and solving our model economy to establish the key implications. Section 3 contains the empirical analysis, describes our methodology and data, presents our main findings and reports the results of various sensitivity checks. Section 4 contains a few concluding remarks.

## 2. Theory

Consider an OLG economy in which activity extends over an infinite discrete time period. In every period one homogeneous good is produced, which can either be consumed in that period or stored to yield capital at the beginning of the following period. In each generation individuals live for three periods: childhood, adulthood and retirement (or old age). Each individual is endowed with two units of time in adulthood, and zero units when in childhood and old age. Children

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