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Economic growth and crime: Is there an asymmetric relationship?☆

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ABSTRACT

We examine the relationship between crime and per-capita output growth in a panel of 26 countries for 1995–2009, focusing on the various channels through which crime can constrain growth and exploring the extent to which these channels are influenced by economic conditions. A simple structural growth model serves as a guide for the empirical specification and a reference point for the interpretation of the empirical results. Our estimates suggest significant potential gains from reducing crime during periods of worsening economic conditions, when market sentiment is pessimistic, and thus uncertainty regarding the return to saving is above average, employment is low, and the strain on government-sector resources through high public-safety spending is already sizable. Crime does not seem to be so harmful to growth when economic conditions are sufficiently satisfactory. In this respect, our results provide an explanation for the inconclusive empirical evidence, based on reduced-form models, regarding the strength of the growth–crime relationship.

1. Introduction

Crime imposes a burden on society and an extensive literature currently exists suggesting that the socio-economic costs of crime can be sizable (Czabanski, 2008; European Commission, 2010; World Bank, 2006, 2007). And while in most parts of the world crime rates are today lower compared to those recorded a few decades ago, a large fraction of the population in many countries still experiences crime every year. Moreover, public expenditures on crime prevention and law enforcement remain at high levels, crowding out other, more productive, types of government spending. At the same time, the decline in crime-related activity may not continue at the same pace in the coming years, given the reduction in incomes due to the recent fall in economic activity worldwide. In view of these developments, how crime impacts on economic growth becomes particularly important.

Although the importance of crime in determining a country's progress has long been recognized in the economic-policy literature, empirical studies have not yet produced a definite conclusion regarding the effect of crime on growth. Existing findings are contradictory, with some studies suggesting a strong adverse effect of crime on economic growth while other studies report evidence of no statistically significant impact. A recent World Bank study (World Bank, 2006), using a panel of 43 countries for 1975–2000, reports strong growth-reducing effects from higher crime rates even after controlling for a number of other factors affecting growth, including income inequality which is likely to be causally linked to crime. Càrdenas (2007) also finds a statistically significant negative association between per-capita-output growth and crime in a panel of 65 countries, after allowing for unobserved country-fixed effects and controlling for education and public infrastructure. On the other hand, Peri (2004), using provincial-level crime data from Italy, reports results indicating non-linearities in the growth–crime relationship, with modest- and low-crime showing no statistically significant adverse impact on growth. (Burnham et al., 2004), in exploring the effect of central-city crime on US county-level (per-capita) income growth, report results in the same direction, indicating no clear overall growth–crime relationship, with the growth effect of property crime appearing to be weak or perverse. At the same time, Mauro and Carmeci (2007), using data from 19 Italian regions for 1963–1995 and pooled-mean-group estimation techniques, find that crime impacts negatively on income levels but exerts no statistically significant adverse influence on growth rates. Chatterjee and Ray (2009), using a large cross-country dataset for 1991, 1995, 1999 and 2003 and controlling for human capital and institutional quality, report similar results, as they find no strong evidence of a uniformly negative association between growth and crime. Detotto and Otranto (2010), applying an autoregressive model, in which GDP growth is explained by past GDP and a crime proxy, to monthly crime data for Italy for 1979–2002, also find a small annualized real-GDP-growth reduction due to crime, with their estimates indicating cyclical components in the growth–crime relationship.

These results suggest that, despite the growing empirical literature, the effects of crime on economic growth still are not well understood and that the growth–crime relationship is more complex than often assumed in existing studies. Crime may affect growth through four key

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channels: (i) through lower physical- and human-capital productivity, by undermining confidence in the rule of law and thus discouraging innovation and entrepreneurship and the accumulation of knowledge via education; (ii) through the opportunity cost of public control of crime, as government-sector resources that could be used for productive activities, including education, health and infrastructure, are directed to crime prevention and law enforcement; (iii) through reduced labour supply, to the extent that some individuals are inclined to believe that income can be earned through illegal activities while others deliberately reject certain job types or job locations due to the fear of criminal victimization; and (iv) through reduced savings due to less secure property rights, as high crime rates contribute to a general perception of instability and bad business climate. Much of the existing empirical literature uses reduced-form models that cannot shed light on the different channels via which crime impacts on growth and on the extent to which the strength of these different channels is influenced by current economic conditions.

This paper adds to the growth literature by distinguishing between the various mechanisms through which crime may have an effect on economic growth and by exploring the sensitivity of the growth–crime relationship to changing economic conditions in an attempt to identify possible asymmetric effects. Using panel data from 26 countries covering the period 1995–2009, we find that the effect of crime on growth is indeed asymmetric. The growth–crime relationship is found to be strongly negative in bad times, when market sentiment is pessimistic and thus uncertainty is high, employment is low and the strain on public-sector resources through public-safety spending is already sizable, and insignificant in good times. In this respect, our results provide an explanation for the inconclusive empirical evidence regarding the strength of the growth–crime relationship when using reduced-form models.

The rest of the paper is organized as follows. In Section 2.1 we analyse a simple structural growth model, which serves as a guide for the empirical specification and a reference point for the interpretation of the empirical results, while in Section 2.2 we describe the empirical specification. Section 3 describes the data and presents the estimation results. Section 4 contains concluding comments.

2. Growth and crime

2.1. A simple structural model

Insights into how growth may be related to crime can be obtained by examining a simple growth model, with two private input factors, labour, L, and capital, K, along the lines suggested by Agénor (2008, 2010), Barro (1990), Bayraktar and Moreno-Dodson (2010), and Blankenau et al. (2007). In particular, resources claimed by the government can be put into productive uses, such as education, health and infrastructure, which enter into the production function by having the potential to improve the quality of all private input factors, and into non-productive uses, such as expenditures on crime prevention and law enforcement, which do not enter into the production function. Thus, assuming a constant-returns-to-scale technology with respect to L and K, output produced, Y, can be taken to be given by (1a) [1]:

$$Y(t) = Ag_p{}^{*\theta}(R_L L(t))^a (R_K K(t))^{(1-a)} \quad \text{with} \quad R_L = cr^{-\beta}, R_K = cr^{-\delta}, cr = (CR/N), \quad \theta > 0, \beta, \delta \geq 0 \tag{1a}$$

where A is a technology variable (assumed exogenous), $g_p^* = (G_p/Y)$ represents productive public-sector spending, measured by the share of the corresponding government expenditures in GDP, and θ measures the return from such spending. R_L and R_K are labour-productivity- and capital-productivity-reducing factors, potentially related to the crime rate cr, to the extent that a high-crime environment is likely to reduce workers' incentives to accumulate knowledge and enhance skills as well as firms' incentives to engage in innovative entrepreneurial activities. cr is defined as the number of crime incidents, CR, to total population N, while $-\beta$ and $-\delta$ reflect the potentially negative return to output arising from the adverse impact of crime on private-input factors' productivity. Denoting by $y = (Y/N)$ and $k = (K/N)$ per capita output and per-capita capital respectively, output supplied can be expressed in per capita terms as:

$$y(t) = Ag_p{}^{*\theta} cr^{-\gamma} l_p{}^a k(t)^{(1-a)} \quad \text{with} \quad \gamma = \beta a + \delta(1-a) \geq 0 \tag{1b}$$

where $l_p = (L/N)$ is the labour-force participation rate.[2] To the extent that in a high-crime environment some individuals are likely to perceive that they can make a living by engaging in crime-related activities while others are likely to be reluctant to accept late-night jobs or activities and locations associated with high crime-victimization rates, l_p may fall as cr rises. Thus,

$$l_p = [1-\phi(cr)] \quad \text{with} \quad \phi' \geq 0. \tag{1c}$$

At the same time, total government spending as percent of GDP, g^*, is the sum of productive expenditures, g_p^*, and non-productive expenditures, g_{np}^*,which include expenditures on crime prevention & law-enforcement that are likely to be positively related to the level of crime activity cr [3]:

$$g* = g_p* + g_{np}* \tag{1d}$$

$$g_{np}* = q(cr), \quad q' \geq 0. \tag{1e}$$

Accordingly, on the supply side, combining (1b) with (1c)–(1e), per-capita output is given as:

$$y(t) = A\,[\,g* - q(cr)\,]^\theta\; cr^{-\gamma}\; [1-\phi(cr)]^a\; k(t)^{(1-a)}. \tag{2}$$

On the demand side, in the absence of unexpected events, $y(t)$ is the sum of planned private consumption $c(t)$, total planned private investment $i(t)$, and overall government spending $g(t)$, all defined in per capita terms (i.e. $c = C/N, g = G/N, i = I/N$):

$$y(t) = c(t) + i(t) + g(t). \tag{3a}$$

The excess of households' income over consumption, $y(t) - c(t)$, equals private savings, $s(t)$, plus tax payments $\tau(t)$, while planned private investment consists of replacement investment and net additions to the (per capita) capital stock, i.e. $i(t) = (n+\delta)k(t) + \dot{k}(t)$, where δ is the rate of capital depreciation, $n = (dN/dt)(1/N)$ is the rate of population growth (assumed exogenous), and $\dot{k}(t) \equiv dk/dt$. Assuming further

[1] Following much of the recent growth literature, we model productive government spending as a flow variable. Alternatively, it could be specified as a stock variable, in which case g_p in (1a) would correspond to e.g. public investment as percent of GDP and a public-capital accumulation function would have to be added. This would complicate the model, while there would be little difference as far as steady-states were concerned (see e.g. Futagami et al., 1993).

[2] We abstract from equilibrium unemployment resulting from wage bargaining or other labour-market frictions.

[3] To the extent that the size of government, as measured by the share of overall public spending in GDP, reflects socio-economic considerations and elements related to the decision-making process at the political level, g^* is treated as a policy variable, and so it is specified as time-invariant. Over time the government sets g to grow at the same rate as y, so g^* is constant.