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The Effects of Macroeconomic Policies on Crime

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Abstract

This paper investigates whether monetary and fiscal policies, such as lump−sum taxes, distortionary taxation and monetization of public deficit, have criminal impacts. We address this question extending the neoclassical monetary growth model. We have demonstrated that fiscal policies affect crime through government spending. Conversely, the effect of monetary policy, especially inflation, on crime depends on the separability of the utility function.

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1 Introduction

Crime is an extremely important political and economic issue in our day. The considerable costs imposed by crime on its victims and society greatly exceed the private benefits of crime (Becker, 1968; Fender 1999). However, there is definitely no consensus among policy-makers or scholars on how to deal with this problem. This lack of agreement has undoubtedly been brought about by the complexity of the phenomenon, and research on this issue is being conducted in many areas.

In light of this fact, since the seminal article by Becker (1968) [1], crime has been formally dealt with by economists through the construction of micro-fundaments in order to better understand the reasons why agents take part in illicit activities.

Becker's original approach introduces a type of rational behavior in which agents compare their expected returns with the costs of committing a crime, so that the criminal activity will be engaged in if the expected returns surpass the legal alternatives. Therefore, the criminal, as well as the other agents, are considered economic agents who respond to stimuli in a market setting, and whose behavior may be studied by way of an equilibrium study in an optimizing framework.

This article follows the tradition of economic models used to study crime founded by Becker in order to construct an intertemporal general equilibrium model that will allow us to study the relation between macroeconomic policies and crime. In this sense, several articles have recently observed that problems such as unequal distribution of income, poverty, and unemployment have effects on crime (e.g. Hunag et. al., 2002; Burdett et. al., 2003). It is therefore possible to expect that, in certain circumstances, monetary and fiscal policies also affect crime. Also, the monetary and growth literature has indicated a relation between crime and inflation, if the real effects of inflation are considered. In this context, if the Tobin effect (Tobin, 1965) is verified, then inflation would have a positive effect on production (negative on unemployment), which could have a negative effect on crime. On the other hand, if the anti-Tobin effect is verified (e.g. Stockman, 1981) then inflation may be criminally friendly.

The goal of this article is to investigate, in a neoclassical monetary growth context *à la* Sidrauski (1967), how fiscal and monetary policies affect crime. Policies such as the monetization of the public deficit, lump-sum taxation, and distortionary taxation are evaluated with regard to their impact on economic

[1] Other articles that have dealt with the issue of crime in the economic literature are Fleisher (1966), Tullok (1967) and Rotemberg (1968), among others (see Ehrlich, 1996)

agents' decision to engage in criminal activity. Special attention has been given to the inflation effects on crime.

Section 2 outlines the standard model in which crime is inserted in the Sidrauski (1967) model, where the effects of the monetization of the public deficit are investigated. Section 3 covers the relation between fiscal policy and crime, and Section 4 offers concluding remarks.

2 Monetary Policy and Crime

The relation between monetary policy and crime shall be considered according to the hypothesis by which the government emits money to finance its deficit. This means that crime is incorporated in the Sidrauski (1967) model in order to make it possible to consider the consequences that the monetization of the public deficit have on crime. The modeling of the relation between the several variables and fiscal and monetary policy, according to the Sindrauski model, is habitual in economic literature. In that sense the model adopted in this study follows closely Faria (1998).

In order to incorporate crime in the Sidrauski (1967) monetary growth model we initially consider that criminal activity is a diseconomy to production, since negative externalities are generated, thus following the rationale of Becker (1968). This takes place because productive resources are allocated towards an unproductive activity such as crime, having adverse effects on agents' well being. This hypothesis may be directly inserted in the Sidrauski model by introducing crime in the economy's production function.

While agents are stimulated to engage in criminal activities according to the expected positive returns, they are also subject to the effects of crime, with loss in income. According to this idea, we may argue that the total income of a representative agent of this economy will be given by (1).

$$Y = f\left(k, o\right)\left[1 + \phi\left(k, o, \bar{o}\right)\right] \tag{1}$$

where

$$\phi\left(k, o, \bar{o}\right) \begin{cases} = 0, & if\ o = \bar{o} \\ > 0, & if\ o > \bar{o} \\ < 0, & if\ o < \bar{o} \end{cases}$$

Thus, $f(k,o)$ represents the production function, where k is the initial capital stock, with $f_k > 0$, and o the number of hours spent on criminal activity, with $f_o < 0$. On the other hand, $\phi(k,o,\bar{o})$ represents the net income function of the criminal activity, where the agent chooses the number of hours that will be dedicated to crime, when faced with the average number of hours of the other agents, $\bar{o}$. This type of function is commonly used in illicit activity models such as in Ehrlich and Lui (1999).

It must also be pointed out that k appears here in the criminal activity returns function. This is done in order to represent the increase in the expected returns from crime as the economy grows, increasing its capital stock. This hypothesis is widely supported by stylized facts, such as the evident difference between big city crime rates and the crime rates in small towns and/or rural areas, making it clear that in locations with greater capital stocks (e.g. big cities) there is a significantly greater incidence of crime per capita.

As pointed out by Glaeser and Sacerdote (1999) these facts may be explained by several arguments, such as the decrease in the probability the criminal will be punished, the lower costs of criminal activity, or eventhe increase in the expected returns from crime in locations with a high capital stock.

In Sidrauski's model, the representative agent maximizes the current value of his/her utility function subject to a budget constraint where income is allocated between a physical asset and a monetary asset. If we consider that criminal activity directly affects the well-being of an agent, and if we incorporate this in his or her utility function, the Sidrauski model then becomes,

$$\begin{aligned} &\underset{c,m,o}{Max} \int_0^\infty U\left(c,m,o\right) e^{-\rho t} dt \\ &s.t. \quad \dot{k} + \dot{m} = Y - c + x - \pi\, m \end{aligned} \tag{2}$$

Therefore, assuming there is no population growth, m represents the real monetary balance of the economy, where c is consumption, x are the government lump-sum transfers, ρ is the temporal preference rate, and π is the rate of inflation. All the variables are defined in per capita terms. By substituting (1) in (2) and solving the problem, the following first-order conditions are obtained,

$$\frac{u_m}{u_c} = \pi \tag{3}$$

$$u_o + \lambda \left\{ f_o + f_o\, \phi + f\ \phi_o \right\} = 0 \tag{4}$$

$$\frac{\dot{\lambda}}{\lambda} = \rho - \left\{ f_k + f_k\, \phi + f\ \phi_k \right\} \tag{5}$$

Since all agents are considered identical, and are confronted with the same maximization problem, we have that $o = \bar{o}$ becomes an equilibrium condition. At the same time, we have that in a steady state, the lump-sum government transfer is,

$$x \equiv \sigma m = \pi m \Rightarrow \sigma = \pi \tag{6}$$

meaning that the rate of monetary growth (σ) is equal to the rate of inflation. The impact of monetary policy may then be captured by inflation.

At the same time, since in this model's steady-state the per capita variables remain constant, meaning that the shadow-price of capital remains constant, we have that the following equations complete the steady-state condition.

$$u_o + \lambda \left(f_o + f\, \phi_o \right) = 0 \tag{7}$$

$$\rho = \left(f_k + f\, \phi_k \right) \tag{8}$$

$$c = f(k, o) \tag{9}$$

Therefore, the steady-state equilibrium is characterized by equations (3), (7), (8) and (9). Equation (3) supplies us with the marginal rate of substitution between currency and consumption, and equation (7) supplies us with the optimal rule for the construction of a marginal rate of substitution between crime and consumption and/or money, since λ may be easily related to its marginal utilities. Equation (8) concludes, as foreseen by the golden rule, that the temporal preference rate will be different than the marginal product of capital, and Equation (9) demonstrates that the product will be entirely consumed. The relationship between monetary policy and crime may be determined from these equations, as stated in Proposition 1.

Proposition 1 *Monetary policy affects crime if the agents' utility function is not additively separable.*

Proof: If the utility function is additionally separable the system is block recursive, so that equations (7), (8) and (9) may then be used to obtain the optimal levels of k, c and o, regardless of m, whose optimal level may be obtained, as a consequence, from (3). On the other hand, if the utility function is not additionally separable, the (3), (7)-(9) system becomes simultaneous, and the real and nominal variables are no longer independent. Inflation will particularly affect the optimal level of crime.

Proposition 1 states that if the quantity of money held by an agent does not affect the marginal utility of crime, then inflation will not affect the incidence of crime in the economy. Thus, the link between monetary policy and crime that is constructed with this model is the relation between currency and crime in its utility function.

In this context, it is important to remember that both the number of hours spent engaging in criminal activity and the quantity of currency are the ingredients of a choice between income and leisure that an agent must make, for if the agent opts for more money, he or she will have more leisure time, while more hours spent engaging in an illicit activity would mean less leisure time, compensated by greater income. Thus, criminal activity is directly related to an increase in an agent's consumption. If we consider that currency plays a role in minimizing transaction costs, or that it is necessary for consumption, then there will be no reason for currency and hours spent on crime to be separable in the utility function.

An alternative rationale would be to imagine a money-less economy, in which all negotiations are conducted through bartering. In this case, criminal activity would involve a series of costs, since the transport and exchange of stolen goods would create additional costs for said activity. This illustrates that money may lead to a reduction in the costs of crime, since there would a disutility in criminal activity, making it possible to support the idea of non-separability between currency and crime.

3 Fiscal Policy and Crime

3.1 Lump-Sum Taxation

In order to evaluate the impacts of fiscal policy on crime in this model, the Turnovsky (1995) approach has been adapted. This approach introduces a new argument to the utility function, g (government spending). In the current context, said spending could be related to the government's law enforcement policy. The other modification of the model would a budget restriction, in which the representative agent pays a lump-sum tax (T):

$$\begin{aligned} &\underset{c,m,o}{Max} \int_0^\infty U(c,m,o,g)\, e^{-\rho t} dt \\ &s.t. \quad \dot{k} + \dot{m} = Y - c - T - \pi\, m \end{aligned} \tag{10}$$

From the first-order conditions, we obtain the following steady-state condition,

$$c + g = f(k,o) \tag{11}$$

along with equations (3), (7) and (8). It must be pointed out that equation (11) arises from the fact the government finances its deficit by printing money:

$$g - T = \dot{m} + \pi m \tag{12}$$

It is now possible to study the impacts of fiscal policy on crime, according to what is stated in propositions 2 and 3.

Proposition 2 *If the utility function is additively separable, then only fiscal policy will affect crime.*

Proof: If the utility function is additively separable, then the (3), (7), (8) and (11) system is block recursive, and equations (7), (8) and (11) may be used to obtain the optimal levels of k, c and o, regardless of m, whose optimal level may be obtained from (3). On the other hand, changes in g affect the real variables, especially crime.

Proposition 3 *If the utility function is not additively separable, then both fiscal and monetary policy will affect crime.*

Proof: If the utility function is not additively separable, the system (3), (7), (8), and (11) becomes simultaneous, the real and nominal variables become non-independent, and monetary policy then affects crime, for inflation will affect the optimal choice of hours spent on an criminal activity. Fiscal policy continues to affect crime following the same rationale as stated in Proposition 2.

According to proposition 2, only fiscal policy has an impact on crime, while according to proposition 3, that suggests non-separability from the utility function, both fiscal and monetary policies affect crime directly, corroborating proposition 1, discussed above.

3.2 Distortionary Taxation

In order to introduce distortionary taxation in our model, we shall consider taxation as being a function of total consumption:

$$T = T(c) \tag{13}$$

Substituting (13) in (10) and solving the problem, only equation (3) will be altered in the steady state:

$$\frac{u_m}{u_c} = \frac{\pi}{(1 - T_c)} \tag{14}$$

Therefore, it becomes clear that none of the previous propositions shall be altered if distortionary taxation of this sort is considered. Thus, even in the case of distortionary taxation, the effects of monetary policy on crime will continue to depend on the non-separability of the utility function. The only alteration that will occur will be the magnitude of the effects of fiscal and monetary policies on crime.

4 Conclusion

The investigation into why an optimizing agent would engage in an illicit activity has been the subject of several recent studies, having reached prominence in economic research. In this context, the present article has constructed an intertemporal general equilibrium model with micro-fundaments in order to discuss the relation between macroeconomic policies and crime. The monetization of the public deficit, lump-sum taxation, and distortionary taxation were analyzed. We have demonstrated that fiscal policies affect crime through government spending. Conversely, the effect of monetary policy, especially inflation, on crime depends on the separability of the utility function.

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