



## Tax evasion, tax corruption and stochastic growth



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### ABSTRACT

This paper presents a continuous time stochastic growth model to study the effects of tax evasion and tax corruption on the level and volatility of private investment and public spending that are both factors of growth. The model highlights several channels through which the mean and volatility of these variables are affected. We first stress the role of equity markets, showing that the evasion outcome for the private sector is not necessarily viewed as a burden. Equity market performs here have the same role as a policy of tax exemption. In societies in which the share of private investment in percentage of GDP is growing, in which tax cheaters usually choose to shelter the proceeds of their illegal activities from the official financial institutions, and in which the productivity of public spending is often low, tax evasion and tax corruption may contribute to the development of private capital if people find an opportunity to invest the proceeds of their illegal activities in equity markets.

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### 1. Introduction

This paper studies the impact of tax evasion and tax corruption on private investment and government spending, two key determinants of the growth rate and volatility of per-capita GDP. When the public sector is an essential contributor to the economic growth, stagnation and severe swings in economic growth are related to the deficient tax collection systems which do not allow providing the minimum amount of public goods and services necessary for productive activities like infrastructure, education, or investment (see [Friedman et al., 2000](#)). Many countries are still stuck in a vicious circle of both tax corruption and tax evasion, a phenomenon to which the theoretical and empirical literature has paid a great attention (see, among others, [Mauro, 2004](#)). According to the literature, corruption is an important factor contributing to growth volatility (see [Denizer et al., 2010](#)).

This paper suggests that when a government is unable to reduce the level of corruption and tax evasion, an alternative solution could be, either to allow the resources of the evaded tax to be invested in equities (by fostering the development of equity markets) or to raise the efficiency of public spending in order to attenuate the negative externalities of tax evasion on productive public expenditure. To develop these ideas, we use a standard portfolio argument by adopting an open economy stochastic growth model, in line with previous models like

[Turnovsky \(1993\)](#), [Grinols and Turnovsky \(1993\)](#), [Turnovsky \(1999\)](#). Public goods and private investment are both productive inputs in the production function.

The uncertainty in our model is endogenous to the functioning of institutions. It comes from the fact that people hide income from the tax administration and offer bribes to inspectors. Cheating is a risky activity because there is a probability of being detected and a probability of being confronted to a corrupted inspector. The model considers tax evasion, private capital and public spending as endogenous variables and creates a loop between them.

We build upon the idea that tax evasion and tax corruption are non-separable when tax collection is performed by corruptible inspectors (see [Hindriks et al., 1999](#); [Sanyal et al., 2000](#)). However, our model differs from previous models on the same topic in several respects. [Lin and Yang \(2001\)](#) also consider a stochastic growth model of tax evasion, but with no specific role for corruption and no role for public spending as an input in the production function. [Chen \(2003\)](#) also considers a model of tax evasion with productive public capital. Unlike the author, we do not consider any optimizing behavior from the government side. Further, in our model tax evasion generates a source of uncertainty on production. [Dzhumashev \(2007\)](#) uses a framework like ours, but his model applies to a closed economy. In our case, opening the economy allows introducing wealth effects in the model. Considering a general CRRA utility function (with Constant Relative Risk Aversion), we show that the impact on capital accumulation of tax corruption and tax evasion depends upon a trade-off between the risk aversion and the saving behavior. Finally, [Corquetti and Coppier \(2011\)](#) address the issue of the effects of tax evasion and tax corruption on economic growth and they

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apply a game-theoretical approach to a Ramsey model. The authors focus on the strategic behaviors of consumers and bureaucrats and this issue is out of the scope of this paper.

The remainder of the paper is organized as follows. Section 2 sets out the main findings of the paper. In Section 3 we present the model while Section 4 analyzes the optimal choice of the domestic agent. Section 5 presents the steady state distributions, and Section 6 contains the results of a comparative dynamics analysis. Finally Section 7 concludes.

## 2. How do tax evasion and tax corruption affect the economies? Main findings

In order to clarify the understanding of the model proposed in the next section, we briefly summarized our main findings and explain how our work is related to the existing literature on similar topics. The general message of the paper is that, when private capital and public spending are substitutes in the productive sector, the usual externalities of tax evasion can be internalized by private agents and compensate their negative impact of economic growth. But this can be done only at the cost of a higher volatility in production.

In countries with a minimal level of financial development, the proceeds of tax evasion are not necessarily consumed or thrown abroad in foreign banks, but can be used for rising funds to finance private domestic investment. This argument in contrast with a widespread literature suggesting a negative link between tax evasion and economic growth, especially in the developing countries (see, for instance, Barreto (2000), Brevik and Gartner (2008), Ehrlich and Lui (1999)).

Unlike many previous papers, we connect tax evasion and tax corruption. We refer to the empirical observation according to which, when corruption is widespread, a connection is established between corruption activities by bureaucrats and the countries' fiscal policy. Both tax evasion and tax corruption reduce the ability of the administration to raise funds to finance the economic growth, since both are diverted for private use. But, we distinguish between the diversion to bureaucrats' and households' private use. While bribes are very often consumed (rent seeking activities), the proceeds of tax evasion can be re-invested in private ownership of firms.

In our model, the decision to cheat and corrupt a bureaucrat is the result of a rational choice. This decision generates negative externalities in the production activity, because the amount of evaded income yields lower tax revenues that are used to finance public goods and services. Tax evasion and tax corruption are also a source of volatility of per-capita GDP, capital, spending and consumption. In our model the agent internalizes the potential spending externalities on production

caused by her behavior. Though she does not obtain utility from public expenditure, the consumer–producer knows that tax evasion and tax corruption impact the amount of per-capita spending in the economy and thus the amount of income she will receive from production. This knowledge could encourage evasion if the return on the equities generated by tax evasion is higher enough so that the positive impact on production of a higher share of private capital exceeds the negative impact of public spending externality. This is likely to happen if the agent faces a favorable gamble, for instance with a low probability of being caught and convicted and for the likelihood of paying a bribe when detected is high. A key parameter is also the degree of risk aversion because the agent may rather decide to consume the extra-income from cheating. In this case, she would reduce her share of domestic and foreign capital out of wealth because, according to her preferences, consuming an unexpected income (random income) is better than taking part in a gamble.

Tables 1 and 2 display our main findings.

Assume that we are in a “poor” country in which consumers have preferences characterized by a strong risk aversion and thus by a high curvature of the utility function (high  $\gamma$ ). Further assume that the country also lacks developed equity markets and that the productivity of public goods and services is low, that the tax administration faces difficulties in collecting taxes and that consumers escape tax payments by paying bribes to the bureaucrats. According to the tables, not only will tax evasion and tax corruption reduce the mean growth, but per-capita output will also be highly volatile. This implies situations in which tax evasion deepens recessions. There are several ways in which a government could smooth the cyclical fluctuations of the economy. It could raise the efficiency of public spending in order to reduce the degree of the public spending externality in the presence of tax evasion. Another possibility would be to reduce the incentive for cheating by employing an efficient technology to detect tax evasion or to fight corruption. The government may also want to limit the negative effects of tax evasion on the mean growth, by allowing people to invest their ill-gotten benefits in equity markets. However, if agents have a high risk aversion, the wealth effects on consumption will be important, thereby implying a decrease in their holding of private capital.

Now imagine a country in which a government faces tax noncompliance, but in which taxpayers want to buy domestic and foreign equities (we assume that they have a low risk aversion). Assume that, in this country, the productivity of public spending is low, that people have incentives to pay bribes to government tax collectors, that income tax evasion is widespread. Finally, let us assume that the government is unable to implement an effective fight against corruption and tax evasion.

**Table 1**  
Impact of tax evasion and corruption on private capital and public spending.  $p$ : probability of being caught,  $p_1$ : probability of facing a corrupted bureaucrat,  $b$ : amount of bribe, and  $\bar{\theta}$ : expected returns of a unit of evaded tax.

<i>Low incentive for cheating</i>		
Impact on private capital	Magnitude increases with degree of financial openness ( $n_d^*$ ) and risk aversion ( $\gamma$ )	$p, p_1, b,$ and $s$ are high (or increase)
		(+) Wealth effects on consumption ratio
		(–) Positive externality of public spending on consumption
		(–) Higher risk of investing in private capital: $\omega_1$
Public spending	$p, \bar{\theta}, \tau$	(+) Output-enhancing public spending
Private capital	$\tau$ which influences the tax income yield $\alpha^s/(\beta^s)^2$	(–) Internalization: higher public spending reduces the agent's incentive to accumulate private capital
	Equity market depth ( $n_d$ )	
<i>High incentive for cheating</i>		
Impact on private capital	Magnitude increases with degree of financial openness ( $n_d^*$ ) and risk aversion ( $\gamma$ )	$p, p_1, b,$ and $s$ are low (or decrease)
		(–) Wealth effects on consumption ratio
		(+) Negative externality of public spending on consumption
		(+) Lower risk of investing in private capital: $\omega_1$
Public spending	$p, \bar{\theta}, \tau$	(–) Diversion of productive public spending
Private capital	$\tau$ which influences the tax income yield $\alpha^s/(\beta^s)^2$	(+) Internalization: lower public spending increases the agent's incentive to accumulate private capital
	Equity market depth ( $n_d$ )	

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