

# 10. Tax Evasion and the Balance of Payments

**Thomas Moutos**

---

## 1. Introduction

The worldwide phenomenon of tax evasion has attracted increasing attention in recent years. Tax evasion is usually (but not exclusively) associated with the «underground»,<sup>1</sup> «unofficial» or «black» economy. The underground economy consists of activities that range from perfectly legal to totally criminal. These activities avoid official detection, distort official statistics and can make the design of proper economic policies extremely difficult. For example, if the underground economy is growing faster than the official economy, and this is not properly measured by the national accounts authorities, the rate of growth of the country will be underestimated. This could lead to policies which, although they seem appropriate on the basis of what is officially known about the economy, are actually overly expansionary.

In a properly functioning market economy, without a public sector, no legal activities would be performed in the underground economy. The growth of the public sector, with the associated increase in regulation and tax rates, has provided an incentive for the growth of the underground economy. In recent decades, the share of taxation in the gross national product of many countries has increased substantially, and in some cases it is higher than fifty per cent. Moreover, the top marginal tax rates have been even higher. When tax rates are high, the cost of honesty also becomes high. Many taxpayers who, under lower tax burdens would have been honest, may make the transition to tax evasion.<sup>2</sup> Obviously, it is not just the level of the tax rates that is important, but also perceptions about the public sector. If taxpayers think that public expenditure is wasteful or that the tax burden is inequitably distributed, there will be a tendency to tax evasion.

The considerable literature on the microeconomics of tax evasion (see Cowell (1989) for a comprehensive survey) has reached the commonsense conclusion that increasing either the probability of detection or the penalty imposed on evaders that get caught, will reduce evasion. This conclusion should not, however, be interpreted as implying that if tax evasion is per se a bad thing, total compliance could be ensured costlessly. There are both economic and political costs associated with higher probabilities of detection and heavier fines, which make «microeconomic» only cures of tax evasion unworkable.<sup>3</sup>

The macroeconomic literature on tax evasion has concentrated on the implications for loss in government revenue associated with tax evasion. Peacock and Shaw (1982) demonstrated that an increase in tax evasion may lead to no

reduction in government revenue, as the decrease in the effective rate of taxation generates output increases which replenish the lost tax revenue. Ricketts (1984) and Lai and Chang (1988) have modified the Peacock and Shaw conclusions by introducing a monetary sector and aggregate supply considerations in the Peacock and Shaw model. These additions make Lai and Chang conclude that increases in tax evasion may actually increase tax revenue rather than reduce it.

The distinguishing characteristic of all these macroeconomic studies is that no attention is paid to the allocative consequences of tax evasion. The present chapter adopts a macroeconomic approach that emphasizes the allocative effects, and examines the implications of tax evasion for the balance of payments and on policies that could both reduce the tax revenue losses and improve the balance of payments. In order to help in the analysis of these issues I use a two-sector model of a small open economy known as the dependent economy model. Assuming that the rates of tax evasion differ between the two sectors, it follows that any policy that manages to shift resources from the sector with the higher rate of tax evasion to the other sector, will succeed in reducing the tax revenue losses and improve the balance of payments.

The rest of the chapter is organized as follows. Section 2 presents the model, Section 3 investigates the effects of tax evasion and Section 4 assesses possible macroeconomic policy responses. Finally, the conclusion summarizes the main findings of the analysis and speculates about the implications of relaxing some of the assumptions of the model.

## **2. The Model**

In this section, I present the simplest two-sector model available for capturing the effects of tax evasion on the balance of payments. This is the dependent economy model of Salter (1959) and Swan (1960). The country in question is a small open economy, assumed to be a price taker in the world market of both importable and exportable goods. That is, the country's terms of trade are exogenously given and therefore we can aggregate importables and exportables into a composite commodity called traded goods.

The domestic country produces another good which is not traded in world markets - the nontraded (or home) good. This commodity can best be thought of as services - physician's services, restaurant services and so forth - or as a potentially traded good that is not in fact traded because of prohibitive tariffs, high transport costs or other man-made barriers. Obviously, an increase in demand for such goods that raises domestic prices can turn a prohibitive tariff to a non-prohibitive one and make some of the nontraded goods importables. In what follows I assume that the nontraded good is sufficiently sheltered to remain nontraded at all relevant prices.

To the assumption of given terms of trade we add the further assumption of perfectly competitive goods and labour markets, and of wage and price flexibility. Full employment is thus ensured, and the economy is always operating at a point on its production possibilities frontier. For the short-run considerations of this analysis,

it seems natural to assume that the two sectors - traded and nontraded - have a fixed amount of specific capital which is immobile between sectors. There are  $L$  households in this economy, each one of them been endowed with a unit of labour, which they offer inelastically. Labour is mobile between sectors and its allocation to each sector is endogenously determined. Denoting by  $P_T$  and  $P_N$  the prices of traded and nontraded goods it is well known that in a perfectly competitive economy the supplies of traded and nontraded goods are functions of the relative price of traded goods in terms of nontraded (or home) goods. That is

$$Q_T = Q_T(\ddot{e}) \quad Q'_T > 0 \quad (1)$$

$$Q_N = Q_N(\ddot{e}) \quad Q'_N < 0 \quad (2)$$

Where  $\ddot{e} = P_T/P_N$ . in a model without taxes,  $P_T$  and  $P_N$  would stand for the prices paid by the consumers and received by the producers. In this chapter we assume the existence of a comprehensive (wage plus profit) proportional income tax  $t$ , which is levied on both sectors. The incidence of taxation is not however equally distributed between the traded and nontraded sectors. I assume that only a proportion  $h$  of the income generated in the nontraded sector is declared to the tax authorities, whereas the proportion of income generated in the traded sector that is declared to the authorities is  $h_T > h$ . I now justify this assumption. For some countries, tax evasion will be obviously more prevalent in the traded sector. One such example is the case of countries producing and exporting narcotics.<sup>4</sup> However, producing and selling narcotics is an illegal activity and I want to stay clear of illegal activities in (at least) this chapter. Amongst the legal activities of the nontraded sector, the provision of services - those of the carpenter, motor-mechanic, plumber, dentist - is an area with widespread tax evasion. Then there are «moonlighters»: people who have a reported first job on which taxes are paid, and one or more other jobs whose incomes are not reported. Public sector employees with moderate incomes also fall in this category; an example is of high school teachers providing private tuition, with that «extra» income being wholly unreported. Moreover, in many countries the nontraded sector is far more regulated than the traded sector. The more regulated a sector is, the greater will be the pressures to circumvent the regulations. In the process, various activities that cannot be controlled will come into existence, and incomes will be generated which remain largely untaxed. For simplicity, and without any loss of generality, in what follows I assume that there is no tax evasion in the traded sector, i.e.  $h_T = 1$ .

Equations (1) and (2) have now to be modified to

$$Q_T = Q_T(\ddot{e}(1-t)/1-th) \quad Q'_T > 0 \quad (1)'$$

$$Q_N = Q_N(\ddot{e}(1-t)/1-th) \quad Q'_N < 0 \quad (2)'$$

where  $\tilde{e}(1-t)$  is the relative after tax price of traded goods in terms of home goods received by the producers. The private sector demands for traded and home goods are functions of relative prices  $\tilde{e}$ , and real (in terms of home goods) disposable income  $\tilde{O}$ :

$$D_T = D_T(\tilde{e}, \tilde{O}) \tag{3}$$

$$D_N = D_N(\tilde{e}, \tilde{O}) \tag{4}$$

where  $Y = (1-t)Q_N + \tilde{e}(1-t)Q_T$ . I assume that a rise in the relative price of traded goods, given  $Y$ , reduces the demand for traded goods and increases the demand for home goods. A rise in real income increases the demand for both goods. This completes the description of the model.

Assuming that the price of traded goods is fixed in world markets, the (relative) price of traded goods in terms of home goods  $\tilde{e}$ , adjusts so as to maintain equilibrium in the market for home goods. That is

$$Q_N(\tilde{e}(1-t)/1-t) = D_N(\tilde{e}, \tilde{O}) + G_N \tag{6}$$

where  $G_N$  is government purchases of nontraded goods. The difference between the demand and supply of traded goods is the trade deficit. Denoting the trade deficit by  $B$ , we have

$$B = D_T(\tilde{e}, \tilde{O}) - Q_T(\tilde{e}(1-t)/1-t) \tag{7}$$

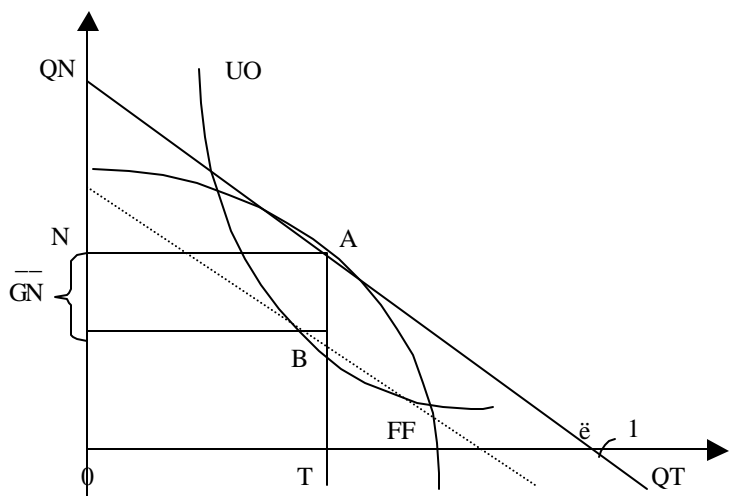
Without any loss of generality I assume that all government spending falls on home goods. As long as the government runs a balanced budget, and relative prices adjust to keep the market for home goods in equilibrium, Walras' law ensures that there will be external balance, i.e.  $B = 0$ . In the following section, I examine the problems that arise when the government cannot balance its budget in the presence of tax evasion.

### 3. Analysis

Figure 1 illustrates the initial equilibrium for the dependent economy. Implicit behind the supply functions for traded and nontraded goods, as given by equations (1)' and (2)', is the condition of equilibrium in the labour market. Accordingly, these supply functions correspond to full employment supplies, and give rise to the production possibilities frontier (PPF), denoted by FF in Figure 1. Assuming, for the moment, that there is no tax evasion in either sector, the relative prices faced by producers and consumers will be equal. Without any tax evasion, the government runs a balanced budget, and disposable income for the households in terms of home goods is  $Y^d = Q_N + \tilde{e}Q_T - G_N$ . The solid line in Figure 1 has a slope equal to the equilibrium relative price ratio,  $\tilde{e}$ . The equilibrium output levels for each sector are OT and ON. Given that the government demands  $G$  of home goods and the budget is

in balance the broken line passing from point B and parallel to the solid line, represents the private sector's «budget constraint». Maximum welfare is attained at point B, where the «social<sup>5</sup> indifference curve»  $U_i$  is tangent to the private sector's budget constraint. The private sector's demands for traded and nontraded goods are such that the market for nontraded goods is in equilibrium and trade is balanced.

Figure 1



Consider now the case of tax evasion in the nontraded goods sector. Moreover, assume that the government finds it not feasible to both reduce its spending on nontraded goods and to increase the tax rate in order to cover for the shortfall in revenue. Tax evasion, by increasing disposable income will initially increase the private sector's demand for both home and traded goods. On the supply side, the reduction in the effective after-tax relative price of traded goods, will increase the supply of home goods and reduce the supply of traded goods. These developments imply that the trade balance will move into deficit. Figure 2 illustrates this case.

Without tax evasion, allocation of output between the two sectors is given by point A, with line 1 denoting both the consumers and producers relative price of traded goods. With tax evasion, the effective after tax relative price becomes  $q'(1-t)/1-t$ , given by the slope of line 2, and production moves to point A' on the FF. For the market for home goods to be in equilibrium, private sector consumption must be equal to  $KB'$ . Since tax payments by the private sector to the government are less than government spending  $G_N$ , the private sector's «budget constraint» will no longer



necessarily be the case, is the appearance of a trade deficit equal to  $B'C$ . The effects on welfare are nevertheless ambiguous. It is possible, unlike Figure 2, that tax evasion can shift an economy to a higher level of welfare. This will be more likely when the slopes of lines 1 and 2 are not very different; ie when the misallocation of production towards nontraded goods is not large. It is obvious that any such situation cannot be maintained in the long-run. Any temporary improvement in welfare of the home country is bought at the expense of foreign indebtedness, and it carries with it the burden of servicing the foreign debt. Domestic consumption of traded goods will have to decrease in order to run a trade surplus equal to the debt interest payments. This adjustment will necessarily imply a fall in welfare to below the pre-tax-evasion level  $U_0$ .

#### 4. Policy implications.

Are there any policies which the domestic government could pursue in order to correct the misallocation of resources arising from tax evasion in the nontraded sector? Assuming that tax evasion cannot be eliminated (in the sense that the costs of eliminating it would exceed the benefits), an obvious response would be to increase the tax rate applied to the home goods sector and/or reduce the tax rate applied to the traded sector. Taxes in the two sectors could be set in such a way that  $q(1-t_T)/(1-t_Nh) = q$  or  $t_T = t_Nh$  where  $t_T$  and  $t_N$  are the tax rates for the traded and nontraded sectors respectively. Since in this model factor supplies are perfectly inelastic, such a policy would not affect the economy's PPF. Moreover, it would not create a distortion in relative prices faced by the consumers. Such a policy, however, might be very difficult to administer. In addition, if for non-economic reasons the government is not willing to raise the tax rate of the nontraded sector, the (necessary) reduction of taxation of the traded section (so that  $t_N = t_Nh$ ) would, taken by itself, increase the budget deficit. The same might be true for the trade deficit as well, if the increase in the disposable income and spending on traded goods exceeded the increased supply of traded goods, resulting from the increase in the after-tax relative price of traded goods.

Another possible response would be to impose a tariff on the traded (and imported) good. Since a tariff is a tax on imports, if the country levying the tariff is small (as we assume here), the tariff would have no effect on the world price of the commodity. Instead, the traded (and imported) good will become more expensive at home, both to home producers, who can be expected to support the tariff and to home consumers, who would not prefer such a duty. It is well known that in a first best world such a tariff, by reallocating resources away from the nontraded sector would reduce the country's real income and welfare. But if the pre-tariff allocation of resources is not optimal, the imposition of a tariff by a small country can actually increase welfare. Figure 3 illustrates this case. This Figure partly reproduces Figure 2.

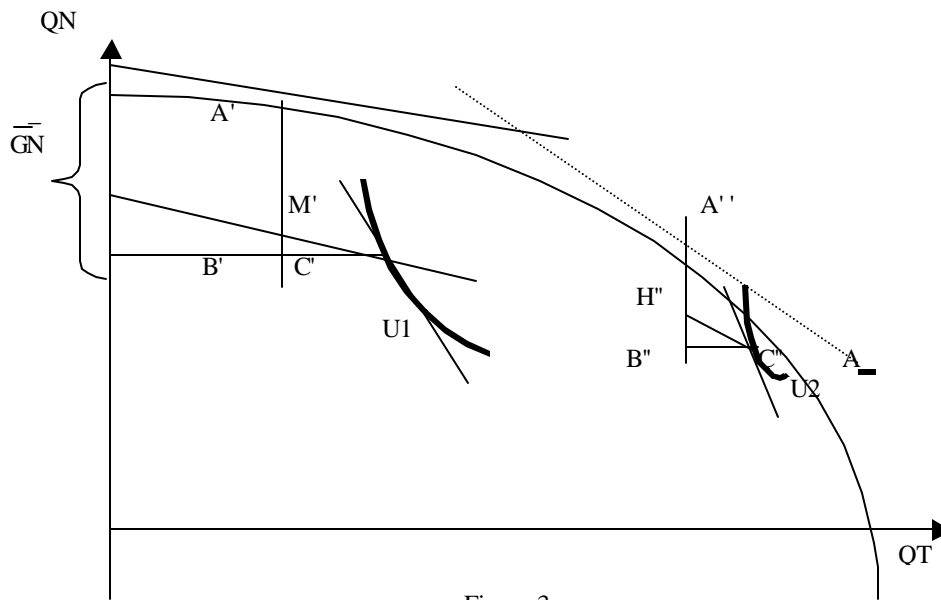


Figure 3

Point  $A'$  shows how production is allocated to the two sectors before the imposition of a tariff. If an ad-valorem tariff is imposed, then the relative after-tax price faced by the producers becomes  $q(1-t)(1-\ddot{a})/(1-th)$  where  $\ddot{a}$  is the tariff rate, and production moves to point  $A''$ . With an unchanged level of  $G_N$ , private consumption moves to a point like  $C'$ , which may as shown in the diagram involve a higher level of welfare (in the current period) than point  $C$ . The reduction in the production of nontraded goods along with the creation of tariff revenue implies that the budget deficit will decrease. This deficit is shown in Figure 3 as the distance  $M'\hat{A}'$ , which is smaller than  $MB$ . The trade deficit will however definitely shrink from being equal to distance  $B'C'$  before the tariff to  $B''C''$  after the tariff, as long as the government does not rebate the tariff revenue to the private sector. Is it possible that a high enough tariff rate can create a trade surplus? The answer is no, since a trade surplus implies (in the present model) no tariff revenue and therefore a budget deficit which, along with market clearing in the non-traded sector, necessarily implies a trade deficit. To recapitulate then, the imposition of a tariff will reduce both the trade deficit and the budget deficit. Whether it will be a feasible possible option for a small open economy to raise (or impose) its tariff rate within the GATT rules is debatable. But what is clear from the above analysis, is that it can be a welfare improving policy in the present model's second best world.

From the above discussion, it is clear that a devaluation of the country's currency will as well succeed in reallocating production away from non-traded to traded goods and therefore to increase tax revenue and improve the balance of payments. But the increase in government revenue will not be as large as imposing a tariff, since with a devaluation no extra tariff revenue will be collected by the government. However, devaluation is both a feasible policy of international adjustment, and it is many times proposed by international organizations (i.e. IMF) for countries which face economic structures and problems similar to the ones described in this chapter.

## **5. Conclusion**

Within the confines of the dependent economy model I have shown that differences in the rate of tax evasion across sectors can result in trade deficits larger than the ones that would prevail if tax evasion was the same between sectors. An increase in tax evasion not only increases disposable income and the private sector's spending on both traded and nontraded goods, but it reallocates production away from traded goods to non-traded goods - the nontraded sector being the sector with a higher rate of tax evasion. The imposition of a tariff on imports of traded goods has been shown to result in a reduction of both the budget and trade deficits and an increase in the country's real income. This result seems to be verified by the experience of countries with a high degree of tax evasion. For example, for a country like Greece, the reduction in tariffs associated with entrance to EEC has been associated with increased trade and budget deficits.

The results in this chapter have been demonstrated by assuming different degrees of tax evasion between the two sectors. What is the importance of this assumption? If the two sectors had the same degree of tax evasion, then increases in the degree of tax evasion would have no allocative consequences but it would still result in large increases in budget and trade deficits. What if tax evasion was more prevalent in the traded goods sector? Then increased protection for the traded goods sector would result in higher budget and trade deficits. Another crucial assumption of this chapter has been that factor supplies are inelastic. If in response to increases in tax evasion, the PPF moves outwards and government spending remains the same, it will no longer be necessarily true that both the budget and trade deficits will widen. An increase in tax evasion would move the PPF outwards if the increase in the effective after tax wage results in increased labour supply (at least) by some sections of the population. For a given level of government spending this increase in real income associated with a higher rate of tax evasion could either increase or decrease the budget deficit and therefore either deteriorate or improve the trade deficit respectively. However, as long as the nontraded sector «enjoys» a higher rate of tax evasion than the traded one, increases in the tariff rate will still succeed in reducing both the trade and budget deficits.

**Notes:**

- 1 For some countries (i.e. Italy, Greece) it is believed that the underground economy represents more than 25 percent official GNP. For estimates of the size of the underground economy in different countries, see Tanzi (1982).
- 2 See, however, the analysis in Allingham and Sandmo (1972) and Yitzaki (1974) which suggests that increasing the tax rate could increase compliance under certain assumptions.
- 3 For more on this point see Goode (1981). Becker (1968) and Polinsky and Shavell (1979) indicate that as long as law enforcement is costly, society should forego “complete” enforcement of the law.
- 4 I owe this suggestion to Huw Dixon.
- 5 Samuelson (1956) is the basic reference for the problems involved in aggregating indifference curves of individuals in order to talk about the welfare of the country.

**References:**

- Allingham, M. G. and A. Sandmo (1972) , «Income Tax Evasion: A Theoretical Analysis», *Journal of Public Economics*, 1: 323-338.
- Becker, G. S. (1968) , «Crime and Punishment: An Economic Approach», *Journal of Political Economy*, 76: 169-217.
- Cowell, F. A. (1989), *Cheating the Government: The Economics of Evasion*, MIT Press, Cambridge Mass.
- Goode, R. (1981) , «Some Economic Aspects of Tax Administration», *IMF Staff Papers*, Vol. 28, pp.249-74.
- Lai, C. C. & Chang, W. Y. (1988), «Tax Evasion and Tax Collections: An Aggregate Demand-Aggregate Supply Analysis», *Public Finance/Finances Publiques*, Vol. 43, No.1, pp.138-46.
- Peacock, A. & Shaw, G. K. (1982), «Tax Evasion and Tax Revenue Loss», *Public Finance/Finances Publiques*, Vol. 37, No. 2, pp. 269-78.
- Polinsky, M. A. and S. Shavell (1979), «The Optimal Trade-Off between the probability and the Magnitude of Fines», *American Economic Review*, 69: 880-889.
- Ricketts, M. (1984), «On the Simple Macroeconomics of Tax Evasion: An Elaboration of the Peacock-Shaw Approach», *Public Finance/Finances Publiques*, Vol. 39, No. 3, pp. 420-24.
- Salter, W. (1959), «Internal and External Balance: the role of price and expenditure effects», *Economic Record*, Vol. 35, pp. 226-38.
- Samuelson, P. A. (1956), «Social Indifference Curves», *Quarterly Journal of Economics*, Vol. 70, pp. 1-22.

- Swan, T. (1960), «Economic control in a dependent economy», *Economic Record*, Vol. 36, pp. 51-66.
- Tanzi, V. (1982) , *The Underground Economy in the United States and Abroad*, Lexington Books, Mass.
- Yizhaki, S. (1974), «A Note on Income Tax Evasion: A Theoretical Analysis», *Journal of Public Economics*, 3: 201-202.