

# DETERRENCE AND THE TAX TREATMENT OF MONETARY SANCTIONS AND LITIGATION COSTS

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## ABSTRACT

The paper explores the effects of alternative tax rules regarding monetary sanctions and litigation costs on the levels of criminal activities and litigation expenditures. The key insight is that taxation may affect crime not only by changing the relative expected returns from legal and criminal activities but also because it may affect the costs and benefits associated with litigation. The positive cross-effects between crime and litigation expenditures, that is, the fact that criminal activities and litigation expenditure may be complements, yield interesting, counter-intuitive results. For example, contrary to common beliefs, nondeductibility of monetary sanctions may *increase* the level of crime, if litigation expenses are deductible. In addition, conditioning deductibility of legal expenses on a successful outcome of the trial may also *increase* amounts spent on litigation and time allocated to crime. The paper shows, however, that a pure income tax, that is, an income tax that allows deductions for monetary sanctions and litigation costs, maintains the pre-tax levels of crime and litigation expenditures for risk neutral offenders. The paper briefly explores the policy implications of these results.

## 1. INTRODUCTION

Federal income tax laws impose taxation on income derived from legal and criminal activities. However, they treat the costs associated with criminal acts, in particular, monetary sanctions and litigation expenses, in an incoherent fashion. Monetary sanctions are deemed to violate sharply defined “public policy” and are

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therefore nondeductible for tax purposes [*Tank Truck Rentals Inc. v. Commissioner* (356 U.S. 30 [1958]); *section 162 (f) of the Internal Revenue Code (2003)*]. Litigation expenditures, on the other hand, are deemed to manifest a constitutional right to defend oneself against serious criminal charges, and can be, therefore, deductible for tax purposes [*Commissioner v. Tellier* (383 U.S. 687 [1966])].

This paper explores the effects of alternative rules regarding the tax treatment of monetary sanctions and litigation expenses on the level of criminal activities. In addition, it examines how these rules affect the level of expenditures on litigation. The key insight is that taxation may affect not only the relative expected returns from legal and criminal activities but also the costs and benefits associated with litigation. For example, disallowing deductions for monetary sanctions reduces the relative expected returns from criminal activities but, at the same time, it increases the benefits associated with litigation. In addition, allowing deductions for expenditures on litigation subsidizes the costs associated with litigation.

To the extent that criminal activities and litigation expenses are complements, in the sense that the more you engage in criminal activities the more you are willing to spend on litigation and vice versa, the net effects of taxation may lead to interesting, counter-intuitive results. For example, contrary to common beliefs, disallowing deductions for monetary sanctions is not sufficient to reduce the level of crime. Because litigation expenses are deductible, the U.S. income tax laws may actually encourage criminal activities. Similarly, allowing deductions for litigation costs does not necessarily lead to an increase in such costs. Litigation expenditures may actually decrease, because fines are nondeductible. On the other hand, a pure income tax, that is, an income tax that allows deductions for both monetary sanctions and litigation costs, is

shown to maintain the pre-tax level of crime with respect to risk neutral offenders, even in the presence of expenditures on litigation. By contrast, a tax regime that disallows deductions for monetary sanctions and litigations costs will reduce the pre-tax levels of both crime and litigation expenditures. Finally, conditioning deductibility of litigation expenses on a successful defense in trial does not generate clear results.

While a pure income tax maintains pre-tax deterrence and litigation expenses, our analysis indicates that it is not necessarily efficient. This is so, even if enforcement is set optimally in the absence of taxation. The primary reason is that taxation may affect the efficacy of law enforcement. The analysis suggests then that taxation and law enforcement should be coordinated and optimized simultaneously.

An important possibility is that illegal income will not be reported. Nevertheless, in many cases illegal income is in fact reported. For example, many offenses are committed in the course of running an otherwise legitimate business, such as taxi drivers who speed, messenger services that double park, or trucking companies that overload. In addition, many offenders who commit white-collar crimes, such as those who violate antitrust laws, those who commit fraud, or those who engage in insider trading, are likely to report their illicit gains. If tax rates are sufficiently high, the effects of taxation and of different tax rules can be significant.

The paper is organized as follows. Section 2 provides legal background and reviews relevant literature. Section 3 develops the general model of taxation and crime when offenders can spend resources on litigation. Section 4 examines then the effects of different tax regimes, including a pure income tax, a tax regime where both monetary sanctions and litigation costs are nondeductible, and the current U.S. income tax laws. Section 5 examines the consequences of the Supreme Court decisions in *Tank Truck*

*Rentals Inc.* (356 U.S. 30 [1958]) and in *Tellier* (383 U.S. 687 [1966]). Section 6 extends the analysis in several directions. Section 7 discusses policy implications, and Section 8 concludes.

## 2. LEGAL BACKGROUND AND RELEVANT LITERATURE

Income tax laws in general subject both legal and criminal activities to taxation. In the United States, this approach goes back to the very beginning of federal income tax laws, although it has undergone several changes before coming to its current rest. The very first federal income tax legislation, the Internal Revenue Code of 1913, explicitly levied tax on net income from a variety of sources, including “any *lawful* business carried on for gain or profit”.<sup>1</sup> Three years later, in the Internal Revenue Code of 1916, Congress omitted the qualifying word “*lawful*” without providing any explanation.<sup>2</sup> This omission signaled the intentions of Congress to levy income taxation on illegal activities and business as well. Indeed, in *United States v. Sullivan* (274 US 259 [1927]), a case dealing with the taxability of gains derived from illicit traffic in liquor, the Supreme Court of the United States had no difficulty to interpret the term “income”, currently found in section 61 of the Internal Revenue Code, as including illicit gains. While criminality itself was no longer an obstacle for taxation, questions arose as to whether the legal consequences associated with certain offenses rendered the illicit gains nontaxable. In particular, the issues were whether offenders who neither obtained title over their loot nor had a claim of right, and, what appeared to be more important, who were subject to the obligation to disgorge the illegal gains could be said to have taxable income. These issues were the source of controversy until they were finally, positively resolved in the landmark decision

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<sup>1</sup> See Revenue Act of 1913, ch. 16, § 2B, 38 Stat. 167 (emphasis added). See also Bittker (1974).

<sup>2</sup> See Revenue Act of 1916, ch. 463, §§ 2(a), 39 Stat. 757.

*James v. United States* (366 US 213 [1961]). In *James*, the Supreme Court of the United States held that income derived from *all* unlawful sources is taxable, regardless of any obligation to disgorge the illicit gains. Taxable income includes then income derived from all sorts of lawful and unlawful activities and business, including all sorts of larceny (theft, burglary, embezzlement), all sorts of trade in illegal goods and services (drug trafficking, prostitution, gambling), all sorts of violations of economic regulations (trading on insider information, antitrust violations), and indeed all sorts of offenses in which the offender obtains monetary or monetary-like gains, that is, all income-producing crimes.<sup>3</sup>

In addition to taxing legal and criminal activities, income tax laws contain several, general and specific rules that deal with the tax treatment of various costs incurred as a result of criminal acts. In particular, income tax laws dictate the tax treatment of monetary sanctions and litigation costs. The tax treatment of these criminal-related costs, however, is not coherent. Under section 162(f) of the Internal Revenue Code, monetary sanctions are nondeductible in computing taxable income, even when incurred in a trade or a business or in the production of legal or illegal taxable income.<sup>4</sup> Section 162 (f), adopted in the Tax Reform Act of 1969, essentially codifies the landmark decision *Tank Truck Rentals, Inc. v. Commissioner* (356 U.S. 30 [1958]). In that case, the Supreme Court of the United States held that allowing the deductibility of fines violates sharply

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<sup>3</sup> See, for example, *James* (embezzled funds); *Ruthkin v. United States*, 343 US 130 (1952) (extortion payments and fraud proceeds); *Wood v. United States*, 863 F2d 417 (5th Cir. 1989) (drug sales proceeds); *Frey v. Commissioner*, 1 BTA 338 (1925) (proceeds of illegal gambling transaction); *Greenfeld v. Commissioner*, 165 F2d 318 (1974) (larceny proceeds); *Jones v. Commissioner*, TC Memo 1977-329, 36 TCM 1323 (1977) (prostitution income); *Ames v. Commissioner*, 112 TC 304 (1999) (illicit espionage income). One implicit, de-facto exception to the general rule concerns the income derived from tax evasion, which, for some reason, is not understood to constitute taxable income.

<sup>4</sup> Section 162 (f) provides that “no deduction shall be allowed...for any fine or similar penalty paid to the government for the violation of any law”. Note, monetary sanctions that are incurred in non-producing income activities, that is, in consumption or leisure activities are nondeductible *because* they were not incurred for income production.

defined public policy, because it reduces the “sting” of punishment and thus may encourage crime. Nondeductible monetary sanctions include not only criminal fines, but also civil penalties that serve a punitive purpose. In particular, it includes penalties such as confiscation, forfeiture, and, according to some courts, court-restitution orders. On the other hand, compensatory payments, such as voluntary restitutions, are generally deductible, but sometimes under less favorable terms. Punitive damages are also generally deductible (if incurred in the production of taxable income), even though these payments are punitive in nature.<sup>5</sup>

In contrast to monetary sanctions, legal expenses incurred in defending against criminal charges are generally not disallowed, regardless of the outcome of the trial. Indeed, in the landmark decision *Commissioner v. Tellier* (383 U.S. 687 [1966]), the Supreme Court of the United States held that legal expenses incurred in the *unsuccessful* defense of criminal prosecution may qualify for deduction from taxable income, because no “public policy” is offended when an accused exercises his constitutional right to employ a lawyer to help in his defense. Prior to *Tellier*, the legal practice conditioned deductibility of legal expenses on the outcomes of the trial. Under this practice, legal expenses incurred in the successful defense against criminal charges would not be barred, but those incurred in the unsuccessful defense against criminal charges would be. As noted, the *Tellier* decision eliminated this distinction.

Existing literature on the effects of taxation on crime has examined the tax treatment of fines and similar penalties, but it has not considered the possibility that offenders may spend resources on legal defense to challenge criminal charges. Nor, has it considered, of course, the tax treatment of such spending. With respect to the tax treatment of monetary sanctions, however, several important results were derived. In

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<sup>5</sup> Revenue Ruling 80-211, 1980-2 C.B. 57.

particular, Png and Zolt (1989) and Tabbach (2003) show that a pure income tax regime, that is, a tax regime under which both legal and criminal income are taxable and fines are deductible, maintains the pre-tax level of criminal activities as long as risk neutral offenders are considered.<sup>6</sup> They also show that disallowing deductions for fines reduces the level of crime, when compared to allowing such deductions or to a world with no taxation at all. This paper also examines then the validity of these results when the possibility to invest in litigation is taken into account.

### 3. A MODEL OF TAXATION AND CRIME

This section presents a general, simple model of taxation and crime based on Tabbach (2003) that is modified to include offenders' decision to spend resources on litigation.<sup>7</sup> Like models of property or income-producing crimes in a world with no taxation, the model formulates the criminal problem as a labor supply decision under uncertainty. Nevertheless, the model can also easily capture the case of a legitimate business choosing among activities or inputs part of which are illegal. The model is convenient to examine the effects on crime and litigation expenditures of different, possible tax regimes.

Assume then that individuals can participate in only two market activities, work and crime, and that they make a choice regarding their optimal allocation of time between these two activities at the beginning of a given period. No training or other entry costs are required in either of the activities, and movement between them is costless. A total amount of time,  $T$ , normalized to one, can be allocated between these two activities, a

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<sup>6</sup> Polinsky and Shavell (1998) derive a similar result with respect to the tax treatment of punitive damages.

<sup>7</sup> The model found in Tabbach (2003) is based on Ehrlich (1973). See also Sjoquist (1973).

fraction  $a$  to crime and a fraction  $1 - a$  to work, where  $0 \leq a \leq 1$ . Time devoted to all other non-market activities (leisure) is fixed.<sup>8</sup>

Assume that the returns in both activities are monotonically increasing function of allocated time. The after-tax returns from work are given with certainty by the function  $W(a, t) = (1 - t)w(a)$ , where  $t$  is the proportional tax rate in place.<sup>9</sup> These returns are marginally decreasing, so  $w'(a) < 0$  and  $w''(a) < 0$ .<sup>10</sup> The "real" after-tax returns from crime, on the other hand, depend on, at least, three states of the world: non-apprehension, apprehension without conviction, and conviction with punishment. If not apprehended, offenders receive the after-tax returns from crime that take a monetary or monetary-like form and are given by the function  $C(a, t) = (1 - t)c(a)$ , assumed to be also concave, so  $c'(a) > 0$  and  $c''(a) < 0$ . But with exogenous probability  $q$ , offenders are not completely successful. Instead, they are apprehended and face criminal charges.<sup>11</sup> Then, offenders make a second decision. They decide how much to spend on litigation expenditures,  $e$ .<sup>12</sup> Consequently they are convicted and punished with probability  $p(e)$ .<sup>13</sup> Assume that offenders' investment in litigation reduces the probability of

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<sup>8</sup> The interpretation of the model to models concerning firms (as in Png and Zolt (1989)) is that instead of fixed labor (leisure) time, offenders have fixed endowment (for example money) which they need to allocate to (invest in) legal and criminal inputs.

<sup>9</sup> Thus, we assume away increasing marginal tax rates in either legal or illegal activity.

<sup>10</sup> For ease of notation the returns from legal activities are defined as a function of time allocated to crime rather than as a function of time allocated to work. Because the returns from legal activities, as a function of time allocated to work,  $(1 - a)$ , exhibit decreasing marginal returns, so that,  $w'(1 - a) > 0$  and  $w''(1 - a) < 0$ , it follows that the returns from legal activities, as a function of time allocated to crime, also exhibit decreasing marginal returns, so that,  $w'(a) < 0$  and  $w''(a) < 0$ .

<sup>11</sup> Like in most models of criminal activities, it is assumed that the probability of apprehension is not a function of the level of criminal activity, nor of avoidance activities taken by the offenders. A more general model will allow the probability of apprehension to be also a function of criminal activities and avoidance costs and will consider the tax treatment of such costs.

<sup>12</sup> It is assumed that litigation requires only money resources and not time or effort. Compare, for example, with Slemrod (2001).

<sup>13</sup> For simplicity it is assumed that the probability of conviction and punishment given apprehension is a function of expenditures on litigation only,  $p(e)$ . In particular,  $p$  is not a function of the level of crime and is not changed by the enforcement authorities. In Section 6, the analysis is extended to examine the consequences of making the more realistic assumption that the probability of conviction and punishment is

conviction and punishment but with decreasing rates, so  $p'(e) < 0$  and  $p''(e) > 0$ . If offenders are successful in their criminal defense, they still receive the after-tax returns from crime but they are worse off by the after-tax amounts spent on litigation. These after-tax amounts are  $e(1 - \lambda t)$ , where  $\lambda$  ( $0 \leq \lambda \leq 1$ ) represents the degree of deductibility of litigation costs.<sup>14</sup> If, on the other hand, offenders are found guilty, their returns from crime are further reduced by an after-tax fine, given by the function  $F(a, \delta, t) = (1 - \delta t)f(a)$ , where  $\delta$  ( $0 \leq \delta \leq 1$ ) is the degree of deductibility of fines. As usual, fines are assumed to exhibit increasing marginal severity, so  $f'(a) > 0$  and  $f''(a) > 0$ .<sup>15</sup> To rule out the need to resort to nonmonetary sanctions, namely imprisonment, as a form of punishment, assume further that individuals have initial wealth,  $W$ , that is sufficient to pay any amount of fines.<sup>16</sup> Finally, assume that tax revenues are used to finance government spending that enters individuals' utility function in an additively separable way.<sup>17</sup>

Under the foregoing assumptions, the individual's problem is to choose  $a$  and  $e$ , subject to  $0 \leq a \leq 1$ , which maximizes:

$$(1) \quad E[U(\cdot)] = (1 - q)U(X) + q(1 - p(e))U(Y) + qp(e)U(Z).$$

Where:

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also a function of the level of criminal activities, that is,  $p(e, a)$ . The implicit assumption that enforcement expenditures are constant is justified by the central focus of this paper on the reaction of offenders/taxpayers to different tax regimes. Put differently, we reasonably assume that crime enforcement authorities do not react to tax changes. In Section 7 we reconsider this assumption while evaluating policy implications.

<sup>14</sup> Thus for  $\lambda = 0$  offenders bear the full costs of litigation, while for  $\lambda = 1$  they bear only  $e(1 - t)$ .

<sup>15</sup> Although the severity of punishment can also be a function of amounts spent on litigation, it is assumed that it is not. In any event, the relationship between expenditures on litigation (pre and post conviction) and sanctions are not clear. On the one hand, spending more on litigation (post-conviction) may decrease the level of punishment. But, on the other hand, spending more on litigation (pre-conviction) may signal to judges that offenders are wealthy, which in turn may be taken into account to increase sanctions.

<sup>16</sup> On the effects of taxation on imprisonment see Tabbach (2003).

<sup>17</sup> That is, utility is given by  $E(U) + \delta(G)$ . See, for example, Atkinson and Stiglitz (1980). Since we mainly assume that offenders are risk-neutral, this assumption is not critical, because the income effect generated by taxation is not important.

$$(2A) \quad X = W + (1 - t)[w(a) + c(a)];$$

$$(2B) \quad Y = W + (1 - t)[w(a) + c(a)] - (1 - \lambda t)e;$$

$$(2C) \quad Z = W + (1 - t)[w(a) + c(a)] - (1 - \lambda t)e - (1 - \delta t)f(a).$$

are terminal wealth at the end of the period given non-apprehension, apprehension without conviction, and conviction with punishment respectively.  $U(\cdot)$  is the individual's von Neumann-Morgenstern utility function defined over terminal wealth. If we assume that individuals are risk neutrals, the maximization problem (1) reduces to:

$$(3) \quad EW = W + (1 - t)[w(a) + c(a)] - q[(1 - \lambda t)e + p(e)(1 - \delta t)f(a)].$$

The first order conditions of an interior maximum of (3) are:

$$(4) \quad H_a = (1 - t)[w'(a) + c'(a)] - qp(e)(1 - \delta t)f'(a) = 0$$

and

$$(5) \quad H_e = -q[1 - \lambda t + p'(e)(1 - \delta t)f(a)] = 0$$

Rearranging, these first order conditions can be rewritten as:

$$(4') \quad -(1 - t)w'(a) = (1 - t)c'(a) - qp(e)(1 - \delta t)f'(a)$$

and

$$(5') \quad -p'(e)(1 - \delta t)f(a) + \lambda t = 1$$

These first order conditions have a simple interpretation. They imply that in equilibrium, offenders choose their optimal level of crime, denoted,  $a^*(t, \lambda, \delta)$ , or simply  $a^*$ , where the marginal after-tax returns from legal activities equal the marginal after-tax expected returns from criminal activities (taking into account the effects of expenditures on litigation on the probability of conviction and punishment and therefore on the marginal expected punishment); and choose the optimal expenditures on litigation, denoted,  $e^*(t, \lambda, \delta)$ , or simply  $e^*$ , where the last dollar spent on litigation equals its marginal

benefit in terms of the marginal reduction in expected punishment (taking into account the level of punishment as a result of time allocated to crime) plus the marginal tax savings, to the extent that expenditures on litigation are deductible.

Setting the general model, we can now turn to examine the effects of different tax regimes. This will be done by specifying the values of the parameters  $\delta$  and  $\lambda$ , and investigating how changes in tax rates under the different regimes affect the levels of crime and litigation expenditures. Throughout the analysis it is assumed that the parameters of the model take on values that result in an interior solution.<sup>18</sup>

## 4. TAX REGIMES

### A. A Pure Income Tax Regime

Examine first the effects of a pure income tax regime, that is, a tax regime under which legal and criminal income are taxable and monetary sanctions and litigation costs are deductible (with refund if necessary), all at the same proportional tax rate  $t$ . In terms of our model, a pure income tax regime is captured by setting  $\delta = \lambda = 1$ , so expected wealth (3) becomes:

$$(6) \quad EW = W + (1 - t)[w(a) + c(a) - q(e + p(e)f(a))].$$

and the first order conditions for maximization (4') and (5') require that:

$$(7) \quad -w'(a) = c'(a) - qp(e)f'(a)$$

$$(8) \quad -p'(e)f(a) = 1$$

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<sup>18</sup> The necessary conditions for an interior solution in the absence of taxation require that the marginal expected returns from crime be greater than the marginal return from work evaluated at the point of specialization at work, that is,  $c'(a) - qp(e)f'(a) > -w'(a)$  evaluated at  $a = 0$ . In addition, the marginal expected returns from crime must be smaller than the marginal return from work evaluated at the point of specializing in crime, that is,  $c'(a) - qp(e)f'(a) < -w'(a)$  evaluated at  $a = 1$ . Moreover, the marginal reduction in expected punishment,  $-p'(e)f(a)$ , must be greater (smaller) than one, evaluated at  $e = 0$  ( $e = \infty$ ). The second order conditions for an interior solution are satisfied by assuming decreasing marginal returns from legal and criminal activities, increasing marginal severity of punishment, decreasing marginal returns from spending on litigation and risk neutrality.

A quick inspection of these conditions reveals that none depends on the tax rate. Moreover, conditions (7) and (8) are exactly the same as conditions (4') and (5') would be for  $t = 0$ , that is, in the absence of taxation. Thus, changes in tax rates will neither affect the level of crime nor the amount spent on litigation.<sup>19</sup>

The intuition behind this simple yet powerful result is straightforward. A pure income tax regime implies that expenditures on litigation are cheaper by the percentage of the tax rate, but at the same time are less beneficial, because the effective level of punishment is also reduced by the same percentage of the tax rate. In addition, a pure income tax regime implies that the after-tax marginal returns from work are reduced in the same proportions as the after-tax marginal expected returns from crime (the tax rate). Thus, at the margins, a pure income tax regime does not distort the decisions of how much to engage in crime and of how much to invest in litigation, so it does not affect the level of crime or the amount spent on litigation.

This result generalizes the proposition that deductibility of monetary sanctions maintains the pre-tax level of criminal activities for risk neutral offenders (Png and Zolt (1989), Tabbach (2003)). It shows that that proposition holds even if offenders can spend resources on litigation, as long as such spending is deductible as well.

### *B. Disallowing Deductions for Monetary Sanctions and Litigation Costs*

Consider next a tax regime under which both monetary sanctions and expenditures on litigation are unconditionally nondeductible. In terms of our model, such a regime is captured by setting  $\delta = \lambda = 0$ , so expected wealth (3) becomes:

$$(9) \quad EW = W + (1-t)[w(a) + c(a)] - q[e + p(e)f(a)]$$

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<sup>19</sup> Put differently, if we denote the optimal choices of  $a$  and  $e$  in the absence of taxation as  $a^*$  and  $e^*$ , then  $a^*$  and  $e^*$  would be the optimal choices also in the presence of a pure income tax regime (for any  $t < 1$ ).

and the first order conditions for maximization (4) and (5) require now that:

$$(10) \quad -(1-t)w'(a) = (1-t)c'(a) - qp(e)f'(a)$$

$$(11) \quad -p'(e)f(a) = 1$$

The response of offenders to changes in tax rates under this regime can be investigated by differentiating the first order conditions (4) and (5), understood to hold for  $\delta = \lambda = 0$ ,

with respect to  $t$  and solving for  $\frac{\partial a^*}{\partial t}$  and  $\frac{\partial e^*}{\partial t}$ .<sup>20</sup> We obtain:

$$(12) \quad \frac{\partial a^*}{\partial t} = \frac{1}{|H|} [H_{ea}H_{et} - H_{ee}H_{at}]$$

and

$$(13) \quad \frac{\partial e^*}{\partial t} = \frac{1}{|H|} [H_{ae}H_{at} - H_{aa}H_{et}]$$

where

$$(14) \quad |H| = \begin{vmatrix} H_{aa} & H_{ea} \\ H_{ae} & H_{ee} \end{vmatrix}, \quad H_{ij} = \frac{\partial EW}{\partial i \partial j}$$

The second order conditions for a local maximum imply that  $|H| > 0$  and  $H_{ee} < 0$ . In addition, direct calculation reveals that  $H_{et} = 0$ , and that  $H_{at} = -[w'(a) + c'(a)] < 0$ , so

we can conclude that  $\frac{\partial a^*}{\partial t} < 0$ . To determine the sign of  $\frac{\partial e^*}{\partial t}$ , one should note that

$$H_{ea} = -qp'(e)f'(a) > 0. \text{ Since } H_{et} = 0, \text{ we can conclude that } \frac{\partial e^*}{\partial t} < 0.$$

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<sup>20</sup> Note,  $a^*$  and  $e^*$  can be understood as the optimal solutions under the present regime for  $t = 0$ . Alternatively, if  $a^*$  and  $e^*$  are understood as the optimal solutions under the present regime for a given  $t$ , different than zero, then it should be recognized that these optimal values are different from the values obtained for different tax rates or for different tax regimes. In other words,  $a^*$  and  $e^*$  are different from the  $a^*$  and  $e^*$  discussed in section 4A (concerning a pure income tax).

Allowing no deductions leads then to a reduction in the level of crime and litigation expenditures.<sup>21</sup> The economic explanation of these results is simple. Disallowing deductions for monetary sanctions reduce the expected marginal returns from criminal activities proportionally more than the reduction in the marginal returns from legal activities when tax rates increase. This creates a substitution effect that leads offenders to reduce the amount of time they allocate to crime and increase the amount of time they devote to work. At the same time, at the optimum, the marginal costs and benefits associated with litigation are not affected. That is, at the optimum, a dollar spent on litigation should equal the marginal reduction in expected punishment brought about by spending this dollar, which is the same condition that holds under a pure income tax regime or in the absence of taxation altogether (compare equations (11) and (8)). This follows, of course, because monetary sanctions and litigation costs are treated for tax purposes in the same manner. However, since criminal activity and litigation costs are complements for the taxpayer, in the sense that lower level of criminal activity induces lower litigation expenditures and vice versa, offenders would reduce their investment in litigation costs.<sup>22</sup> The reason is that lower criminal activity implies lower level of punishment, which in turn implies that spending on litigation is less beneficial.

### *C. Disallowing Deductions for Fines While Allowing Deductions for Litigation Costs*

Analyze now the effects on crime and on litigation expenditures of the current U.S. income tax laws under which monetary sanctions are nondeductible but

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<sup>21</sup> Note also that the imposition of the present regime changes the conditions to enter the criminal market (and to specialize in crime). Under the present regime these conditions are less likely to be met. Thus, a nondeductibility regime not only reduces the level of crime of offenders who engage in crime on a part time basis, but it also reduces the level of *participation* in criminal activities (either on a full time or a part time basis).

<sup>22</sup> Mathematically, criminal activities and litigation expenditures are complements because  $H_{ea} > 0$ .

expenditures on litigation are unconditionally deductible. Such a regime is captured in the present model by setting  $\delta = 0$  and  $\lambda = 1$ . Expected wealth (3) becomes:

$$(15) \quad EW = W + (1-t)[w(a) + c(a) - qe] - qp(e)f(a)$$

and the first order conditions for maximization (4) and (5) require that:

$$(16) \quad -(1-t)w'(a) = (1-t)c'(a) - qp(e)f'(a)$$

$$(17) \quad -p'(e)f(a) + t = 1$$

Differentiating the first order conditions (4) and (5), understood to hold now for  $\delta = 0$  and  $\lambda = 1$ , with respect to  $t$  and solving for  $\frac{\partial a^*}{\partial t}$  and  $\frac{\partial e^*}{\partial t}$ ,<sup>23</sup> we obtain again (11), (12)

and (13), where  $H_{at} = -[w'(a) + c'(a)] < 0$ ,  $H_{et} = q > 0$ , and  $H_{ea} = -qp'(e)f'(a) > 0$ .

The second order conditions for maximization still imply that  $|H| > 0$ ,  $H_{ee} < 0$ , and  $H_{aa} < 0$ , so unfortunately one cannot determine unambiguously the signs of either

$$\frac{\partial a^*}{\partial t} \text{ or } \frac{\partial e^*}{\partial t}.$$

These results are more interesting than appear on first glance. They imply that increasing tax rates will not necessarily reduce the level of crime if monetary sanctions are nondeductible, as long as litigation costs are deductible. Similarly, increasing tax rates will not necessarily increase the level of expenditures on litigation even if such expenditures are deductible, as long as monetary sanctions are nondeductible. Indeed, aside from increasing the level of criminal activities and at the same time reducing the level of litigation expenditures, all other behavioral effects are possible.<sup>24</sup>

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<sup>23</sup> Again,  $a^*$  and  $e^*$  should be understood as the optimal solutions under the present regime for  $t = 0$ . See also footnote 20.

<sup>24</sup> Note, however, that the imposition of the present regime changes the pre-tax conditions to enter the criminal market (and to specialize in crime). In comparison to no taxation, these conditions are now less

The economic explanation of these ambiguities is as follows. Disallowing deductions for monetary sanctions reduces the marginal expected returns from criminal activities proportionally more than the reduction in the marginal returns from legal activities when tax rates increase, leading to a substitution effect toward work. In turn, a lower level of crime indirectly leads to lower investment in litigation (because  $a$  and  $e$  are complements). At the same time, however, allowing deductions for litigation expenditures subsidizes the costs of defending against criminal charges with no change in the benefits of litigation. This creates an incentive to spend more on litigation for any level of criminal activity chosen. In turn, higher spending on litigation may induce higher level of criminal activities (because, again,  $a$  and  $e$  are complements). Put differently, when tax rates increase, two opposite forces come into play: on the one hand, the net expected marginal benefit of criminal activity decreases relative to legal activities, and on the other hand, the marginal benefit of litigation, for any level of criminal activity, rises. These forces trigger additional, opposite forces, because criminal activity and litigation expenditures are complements. Accordingly, it is not obvious that offenders will reduce their criminal activities or increase their investment in litigation as a result of tax rates increase. It is perfectly possible that offenders will reduce their criminal activities enough, so as to reduce the total expected punishment they face, thus *reducing* also their investment in litigation. Similarly, though counter-intuitively, offenders may be better off increasing their investment in litigation enough to reduce the total expected punishment from criminal activities, thus *increasing* their total engagement in criminal activities.

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likely to be met. In this respect, the current U.S. income tax laws will reduce the level of offenders *participating* in criminal activities (either on a full time or a part time basis).

## 5. TANK TRUCK RENTALS INC. AND TELLIER

Thus far we have examined how different tax regimes affect the level of crime and litigation costs in comparison to a world with no taxation or for different tax rates.

The results are summarized in Table 1.

Table 1 – The Effects of Different Income Tax Regimes on Criminal Activity and Litigation Expenditures

	Pure Income Tax Regime		No-Deductibility Regime		Current U.S. Income Tax Law	
	<i>Crime</i>	<i>Litigation</i>	<i>Crime</i>	<i>Litigation</i>	<i>Crime</i>	<i>Litigation</i>
<b>Direct Effects</b>	–	–	↓	–	↓	↑
<b>Cross Effects*</b>	–	–	–	↓	↑	↓
<b>Net Effect</b>	–	–	↓	↓	#	#

\* Due to the fact that criminal activity and litigation expenditures are complements,  $H_{ea} > 0$ .

# Indeterminate.

The comparison to a no tax world is important because some offenses, for example, double-parking or speeding, can be committed in a business capacity and thus be subject to taxation or in a personal capacity and thus be effectively tax-exempt.<sup>25</sup> The comparison among different tax rates is also very important because different offenders may be subject to different tax rates and because changes in tax rates occur every now and then. But tax regimes can also be compared. Indeed, when Courts decide what the appropriate tax rule is, they effectively choose between alternative tax rules, holding all other variables including tax rates constant.<sup>26</sup> For example, in *Tank Truck Rentals Inc.*, the Supreme Court decided whether to allow or disallow deductions for monetary

<sup>25</sup> In addition, some offenders may also be effectively exempt from taxation.

<sup>26</sup> While Congress can simultaneously change tax rules, tax rates, or any other variable, including enforcement schemes, generally it does not. See also Section 7.

sanctions. Similarly, in *Tellier*, the decision was whether to allow or disallow deductions for litigation expenses incurred in an *unsuccessful* defense against criminal charges. Although, as discussed in section 7, a simple comparison between tax regimes is problematic because it disregards differences in tax revenues, it may still be very interesting and illuminating.

The effects of the *Tank Truck Rentals Inc.* decision can be easily derived from our prior analysis. They are nevertheless surprising. As shown, a pure income tax regime maintains the pre-tax level of crime, while the current U.S. income tax laws may decrease or increase such pre-tax level (at least for small values of  $t$ ). It follows then that a shift from disallowing to allowing deductions for monetary sanctions will not necessarily encourage crime. While allowing deductions for monetary sanctions effectively diminishes punishment, its “sting”, in the sense of its impact on crime, may not be necessarily lessened. The intuition behind this surprising result is similar to the intuition discussed in section 4C, so it will not be repeated here. Its broader implications are explored in greater detail in another paper.<sup>27</sup>

The behavioral effects of the *Tellier* decision are also less clear than may appear at first glance. But they require further analysis. Expected wealth under a regime that allows deductions for litigation expenditures on condition of a successful defense in trial can be written as:<sup>28</sup>

$$(18) \quad EW = W + (1-t)[w(a) + c(a) - qe] - qp(e)[f(a) + et]$$

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<sup>27</sup> Note, while a shift from allowing to disallowing deductions for monetary sanctions has an unclear effect on the level of crime and litigation expenditures, the same is not true with respect to litigation costs. A shift from disallowing to allowing deductions for litigation costs unambiguously increases the level of expenditures on litigation and the level of criminal activities. The reason is quite simple. A shift from disallowing to allowing deductions for litigation costs is equivalent to giving a subsidy to litigation expenditures in the amount  $te$ . This subsidy reduces the costs of litigation and also the costs associated with crime. These two effects reinforce one another and lead to an increase in the level of litigation expenditures and the level of crime.

<sup>28</sup> Equation (18) implies that offenders can deduct their litigation costs (the second term) but if punished, their punishment is increased by  $et$ .

and the first order conditions for maximization require that:

$$(19) \quad -(1-t)w'(a) = (1-t)c'(a) - qp(e)f'(a)$$

$$(20) \quad -p'(e)[et + f(a)] = 1 - t[1 - p(e)]$$

Comparing equations (19) and (20) to equations (16) and (17) reveals that the only difference between allowing deductions unconditionally to allowing deductions for litigation expenses on condition of a successful defense lie in the different marginal costs and benefits associated with litigation. Allowing deductions for litigation expenses conditionally increases the expected marginal costs of litigation by  $tp(e)$ . At the same time, the expected marginal benefits from litigation are also increased by  $-p'(e)et$ . It follows then that the effects of the *Tellier* decision will depend on whether the expected marginal benefits are greater or lesser than the expected marginal costs, that is, on whether  $-p'(e)et >< p(e)t$ . This condition can be rewritten as  $\eta >< 1$ , where

$$\eta = -\frac{p'(e)}{1} \frac{e}{p(e)}$$

is the elasticity of the probability of conviction and punishment given

apprehension with respect to investment in litigation. If this elasticity is lesser than unity, then the effects of the *Tellier* decision, as one may expect, are to increase the incentives to spend on litigation and, as a result, to increase the level of crime as well. If, on the other hand, the elasticity is greater than unity, than, counter-intuitively, the *Tellier* decision reduces the incentives to spend on litigation and thus leads to a reduction in the level of criminal activities. In the case of unit elasticity, that is, if an increase of 1% in litigation expenditures leads to a reduction of 1% in the probability of conviction and punishment, the *Tellier* decision has no effect on the level of litigation expenditures or the level of crime.

## 6. EXENTIONS

This section explores the sensitivity of our main results to two of the underlying assumptions of the model. In particular, we examine the consequences of allowing the probability of conviction and punishment given apprehension to depend also on the level of criminal activity. We then move to discuss the effects of introducing risk aversion. As the analysis shows, some, but not all, of the results are altered.

### *A. The Probability of Conviction and Punishment Given Apprehension is also a Function of the Level of Criminal Activity*

Allowing the probability of conviction and punishment given apprehension to be a function of both the levels of litigation expenditures and criminal activity generalizes the analysis. One can write then  $p(e, a)$ , and assume that it increases with criminal activity, for any level of litigation costs, with increasing rates, so  $p_a(e, a) > 0$  and  $p_{aa}(e, a) > 0$ .<sup>29</sup> One can also maintain the assumption that investment in litigation reduces  $p(e, a)$  with decreasing rates, for any level of crime, so that  $p_e(e, a) < 0$  and  $p_{ee}(e, a) > 0$ .

Assuming that the probability of conviction and punishment given apprehension is also a function of the level of criminal activities implies that the optimality conditions in the absence or in the presence of taxation will change.<sup>30</sup> Offenders now will have to

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<sup>29</sup> Some may argue that the more one engages in criminal activities the lower the probability he would be convicted and punished, because he would become specialized in some sense. Others, like we do, may argue that the probability of conviction and punishment goes up with the level of crime.

<sup>30</sup> For example, under a pure income tax regime the two first order conditions require that:

$$\begin{aligned}
 -w(a) &= c(a) - qp_a(e, a)f(a) - qp(e, a)f'(a) \\
 -p_e(e, a)f(a) &= 1
 \end{aligned}$$

Note also that the second order conditions for an interior solution are satisfied given our assumptions.

consider also how their level of criminal activities affects the marginal and total probability of punishment and consequently the marginal expected punishment. In addition, offenders will have to examine how their level of criminal activities affects the marginal reduction in the probability of punishment from investment in litigation expenditures. Nevertheless, it is easy to see that a pure income tax regime will not distort the *pre-tax* choices of risk neutral offenders, for exactly the same reasons discussed in section 4A, so the level of criminal activities and litigation expenditures will remain the same.<sup>31</sup>

The qualitative results associated with a no deductibility regime or with the current U.S. income tax laws (derived in sections 4B and 4C respectively) require a more careful analysis. As was explained, these results follow partly from the *complementary* between criminal activities and litigation expenditures. That is, from the fact that higher level of criminal activities induces higher litigation expenditures and vice versa. This property, however, need not hold if the probability of conviction and punishment is a function of the level of crime. In fact, whether criminal activities and litigation expenditures are complements, substitutes, or independent will depend on the sign of  $H_{ea} = -qp_e(e, a)f'(a) - qp_{ea}(e, a)f(a)$ .<sup>32</sup> Note that the first term is positive. This guaranteed the complementary between criminal activities and litigation expenditures in the main model. The sign of the second term, however, depends on the sign of the cross derivative,  $p_{ea}$ , that is on the rate at which the marginal probability of conviction and punishment with respect to litigation expenditures changes as the level of criminal activities changes. If  $p_{ea} \leq 0$ , then the second term is either zero or positive, so

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<sup>31</sup> This can be seen from the fact that the first two order conditions under a pure income tax regime do not depend on the tax rate.

<sup>32</sup> This term has the same form under all alternative tax rules.

$H_{ea} > 0$ , which implies complementary. Otherwise, the sign of  $H_{ea}$  will depend on whether  $\mu = -\frac{p_{ea}(e,a)}{f'(a)} \frac{f(a)}{p_e(e,a)} \leq 1$ , where  $\mu$  is a measure of the elasticity of the *marginal* probability of conviction and punishment given apprehension with respect to the level of punishment. If  $\mu \leq 1$ , then  $H_{ea} \leq 0$ , so criminal activities and litigation expenditures can be complements, substitutes, or independent. If criminal activities and litigation expenditures remain complements, then the qualitative results derived in section 4B and 4C still hold. Otherwise, these results change as indicated in Table 2.

Table 1 – The Effects of Different Income Tax Regimes on Criminal Activity and Litigation Expenditures  
Given  $p(e,a)$

	Pure Income Tax Regime		No-Deductibility Regime		Current U.S. Income Tax Law	
	<i>Crime</i>	<i>Litigation</i>	<i>Crime</i>	<i>Litigation</i>	<i>Crime</i>	<i>Litigation</i>
<b>Complements*</b>	–	–	↓	↓	#	#
<b>Substitutes**</b>	–	–	↓	↑	↓	↑
<b>Independent***</b>	–	–	↓	–	↓	↑

\* For  $p_{ea} \leq 0$  or  $p_{ea} > 0$  and  $\mu < 1$ .

\*\* For  $p_{ea} > 0$  and  $\mu > 1$ .

\*\*\*  $p_{ea} > 0$  and  $\mu = 1$ .

# Indeterminate.

### B. Risk Aversion

Throughout the analysis it was assumed that offenders were risk neutral. This assumption simplified the analysis and helped us concentrate on the insights regarding the interrelations between criminal activities and litigation expenditures. In addition, it was a reasonable assumption with respect to certain offenders, for example, firms, or in certain situations. However, risk neutrality is generally not an adequate assumption when

individuals are concerned. Thus, this section examines how our main results change when risk aversion is introduced. We concentrate on the proposition that a pure income tax regime maintains the level of criminal activities and litigation expenditures. The reason is that the current U.S. income tax laws produce unclear results even for risk neutral offenders. Introducing risk aversion adds more realism to the model, but not without costs. Quite obviously, it complicates the analysis. To simplify, we examine separately the direct effects of a pure income tax on criminal activities and on litigation expenditures, and the cross-effects between crime and litigation costs.

The direct effects of a pure income tax on criminal activities for risk-averse offenders, in a model with no litigation expenditures, were examined by Tabbach (2003). He showed that these effects are ambiguous due to conflicting risk effects. On the one hand, a pure income tax regime reduces the amount of risk associated with criminal activities and thus induces offenders to engage in more crime. On the other hand, a pure income tax regime may reduce wealth and thus induce offenders to engage in less crime (assuming offenders exhibit decreasing absolute risk aversion). These qualitative results stand for the direct effect of a pure income tax on crime in the present model.

Examine next the direct effect of a pure income tax on the incentives to spend resources on litigation. For that purpose, consider the first order condition with respect to the investment decision,  $H_e$ , which requires that:

$$(21) \quad -p'(e)[U(Y) - U(Z)] = (1-t)[(1-p(e)U'(Y) + p(e)U'(Z)]$$

Where:

$$(22A) \quad Y = W + (1-t)[w(a) + c(a) - e];$$

$$(22B) \quad Z = W + (1-t)[w(a) + c(a) - e - f(a)].$$

The term on the left hand side of (21) is the marginal benefit from investing the last dollar in litigation in terms of the reduction in the probability of conviction and punishment given apprehension. The term on the right hand side of (21) is the marginal cost from investing that dollar in terms of the decline in utility in both states of the world. In the optimum, of course, they must be equal.<sup>33</sup> Now, the direct effect can be derived from differentiating both sides of equation (21) with respect to  $t$ , we obtain:

$$(23) -p'(e)[Y_t U'(Y) - Z_t U'(Z)] \geq -[(1-p(e))U'(Y) + p(e)U'(Z)] \\ + (1-t)(1-p(e))Y_t U''(Y) + (1-t)p(e)Z_t U''(Z)$$

where:

$$(24A) Y_t = -[w(a) + c(a) - e]$$

and

$$(24B) Z_t = -[w(a) + c(a) - e - f(a)]$$

Assuming, for example, that  $Y_t < 0$  and  $Z_t > 0$ , a pure income tax regime will increase the marginal benefits from spending on litigation (the left hand side in equation (23) is positive). However, the marginal costs from spending on litigation are ambiguous. The first term on the right hand side of equation (23) is negative, which implies that marginal costs are reduced. So is the second term. However, the third term is positive. Thus, the

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<sup>33</sup> It should be noted, however, that in the presence of risk aversion, that is,  $U''(\cdot) < 0$ , the second order conditions for optimality need not hold. This can be seen from:

$$H_{ee} = -qp''(e)[U(Y) - U(Z)] + 2q(1-t)p'(e)[U'(Y) - U'(Z)] \\ + q(1-t)^2(1-p(e))U''(Y) + q(1-t)^2 p(e)U''(Z)$$

While the first, third and fourth terms are negative for risk aversion, the second term is positive. Note also that  $H_{aa}$  is unambiguously negative for risk aversion.

direct effect of a pure income tax regime on the incentives to invest in litigation is not clear.<sup>34</sup>

Lastly, examine the cross-effects between criminal activities and litigation expenditures. This cross-effect is also not definitive. It depends, as noted, on the sign of:

$$(25) \quad H_{ea} = -p'(e)[Y_a U'(Y) - Z_a U'(Z)] - (1-t)[(1-p(e)Y_a U''(Y) + p(e)Z_a U''(Z)]$$

Where:

$$(26A) \quad Y_a = (1-t)[w'(a) + c'(a)] > 0$$

and

$$(26B) \quad Z_a = (1-t)[w'(a) + c'(a) - f'(a)] < 0.$$

The first term in equation (25) is positive, which implies that criminal activities and litigation expenditures are complements for risk-averse offenders in terms of benefits. That is, higher level of criminal activities increases the benefits from spending on litigation. In this respect, it induces higher investment in litigation. The second term in equation (25), on the other hand, represents the relationship between criminal activities and litigation expenditures in terms of costs. This relationship is not clear. The first term in the second square brackets is negative while the second term is positive. Higher level of criminal activities implies that the costs of investing in litigation, in utility terms, are lower in the good state of the world, but are higher in the bad state of the world. It follows then that criminal activity and litigation expenditures can be complements, substitutes, or independent for risk-averse offenders. To sum up, when risk aversion is introduced the effects of a pure income tax regime on the level of crime and litigation

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<sup>34</sup> Note, if we assumed that  $Z_t < 0$ , then the marginal costs from spending on litigation would be negative. But the marginal benefits from spending on litigation would now be ambiguous. In addition, assuming that  $Y_t > 0$ , would make the marginal benefit and marginal costs from spending on litigation ambiguous when tax rates increase.

expenditures are ambiguous. Not only are the direct effects largely ambiguous, but also the cross-effects between criminal activity and litigation costs are not clear-cut.

## 7. POLICY IMPLICATIONS

This section briefly examines the policy implication from our analysis. It concentrates on the desirability or undesirability of a pure income tax and the current U.S. income tax laws. The examination is not formal. Thus, one should be careful in drawing policy conclusions. The main point of the discussion is that taxation and law enforcement should be coordinated and optimized simultaneously. This is so, primarily because each system may affect the efficacy of the other system.

The analysis shows that a pure income tax maintains the pre-tax levels of criminal activity and litigation expenditures with respect to risk neutral offenders. Assuming that the level of enforcement (the probability and severity of punishment) is set optimally in the absence of taxation, it seems like a pure income tax is efficient. In addition, a pure income tax is efficient from a tax perspective, in the sense that it does not create any excess burden of taxation. Apparently, tax revenues are raised without affecting behavior at all.<sup>35</sup> This, however, is an artifact of leisure time being fixed. Relaxing this assumption will generate the usual income and substitution effects between income producing activities and leisure, so a pure income tax will no longer be associated with no deadweight loss or maintain the pre-tax levels of legal and criminal activities (Tabbach 2005).

That a pure income tax maintains the pre-tax levels of criminal activities and litigation expenditures implies that it is deterrence-neutral. It does not necessarily imply

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<sup>35</sup> The central thrust of this result is quite similar to the general result of the optimal taxation literature regarding the optimality of a proportional tax on *all* endogenous activities in a risk-free environment, which is guaranteed here by assuming risk neutrality.

that it is efficient.<sup>36</sup> Nor that it is necessarily preferable to the current U.S. income tax laws. This is primarily so, because there is no guarantee that the pre-tax enforcement scheme is still optimal once taxation is introduced. Put differently, it is possible that taxation itself affects the optimal choice of enforcement scheme.

Taxation of legal and criminal activities inevitably involves two intertwined issues, that of the optimal tax and that of the optimal criminal enforcement. The design of each system – taxation and law enforcement – may affect the efficacy of the other system. This paper focuses on the effects of taxation on criminal activity and litigation expenditures and thus assumes an existing pre-tax optimal enforcement scheme. In general, such an enforcement scheme would equate the marginal costs of enforcement associated with detection, conviction and punishment and the marginal benefits of enforcement in terms of enhanced deterrence (lower net social harm from criminal activities). Because enforcement is costly, some under-deterrence will be desirable.<sup>37</sup> The marginal costs and benefits of enforcement may depend on offenders' spending on litigation.<sup>38</sup> Moreover, spending on litigation itself might confer social costs and benefits.<sup>39</sup> Ignoring for simplicity these possibilities, an optimal enforcement scheme would generally equate the marginal costs of detection with the marginal costs of

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<sup>36</sup> Png and Zolt (1989) conclude that a pure income tax is efficient in a model without litigation costs. However, their pre and post-tax analysis ignore the costs of enforcement. Moreover, in their post-tax analysis they allow punishment to be readjusted, but implicitly assume that the probability of punishment cannot be altered. In our view, Png and Zolt's analysis achieves deterrence-neutrality but not necessarily deterrence-efficiency.

<sup>37</sup> Polinsky and Shavell (1984).

<sup>38</sup> For example, in the region where higher fines lead to higher criminal activities, increasing fines will confer no marginal benefit in terms of enhanced deterrence, but rather they will only be associated with marginal costs. Optimal fines cannot be set in such a region. Additionally, the marginal costs of convicting offenders may also depend on offenders' investment in litigation.

<sup>39</sup> Offenders' investment in litigation may increase and decrease different types of errors associated with the legal system. On the one hand, litigation expenditures enhances Type I errors (that is they reduces the probability that offenders will be convicted and punished). In this respect, litigation expenditures function like avoidance and they impose social costs. On the one hand, litigation expenditures reduce Type II errors (that is they reduce the probability of convicting and punishing the innocents). In this respect, litigation expenditures confer social benefits. An optimal scheme of enforcement may penalize or subsidize litigation expenditures.

punishment.<sup>40</sup> If the marginal costs and benefits associated with enforcement are a function, either directly or indirectly, of taxation (more generally of tax rates), then the introduction of taxation (changes in tax rates) may affect the optimal enforcement scheme.

To illustrate consider a simple example. Suppose risk-neutral offenders make a choice regarding their optimal allocation of time between legal and criminal activities (assume away the possibility of investment in litigation or more generally in avoidance). Suppose further that the costs of detection do not depend on the level of criminal activity or on offenders' characteristics such as wealth, income and so on, and that these costs are marginally increasing with the probability of punishment. Suppose, on the other hand, that the costs of collecting fines are a function of the level of effective, after-tax fines. Thus, they depend on the level of crime, on the tax rule, and on the tax rate. Suppose further that these costs are marginally increasing with the level of effective fines. Under this stylized example, a pure income tax will not affect the marginal benefits from enforcement, because offenders' behavior is not altered. It will not affect the marginal costs of detection, because the probability of punishment does not depend on any parameter that the tax affects. But, it will affect the marginal costs associated with collecting fines. The reduction in effective, after-tax fines implies that the marginal costs of collecting fines are lower. Thus, in this example, the introduction of a pure income tax calls for re-optimizing the enforcement scheme. Presumably, it would be optimal to increase the (before-tax) level of fines and reduce the probability of punishment.

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<sup>40</sup> This is so, because in the absence of litigation expenditures, risk neutrality implies that the probability and severity of punishment are perfect substitutes in terms of marginal benefit from enhanced deterrence.

Moreover, after re-optimizing the enforcement scheme, the optimal level of deterrence probably rise.<sup>41</sup>

This, of course, is only a simple example. It is quite possible that taxation affects the marginal costs and benefits associated with enforcement in more delicate and complicated ways.<sup>42</sup> However, the main point is that as long as the marginal costs and benefits of enforcement depend on taxation, the introduction of taxation or changes in tax rates may affect the optimal enforcement scheme.

Our model analyzed the positive effects of different tax regimes on the level of criminal activities and litigation expenditures, holding the enforcement scheme constant. Constant enforcement scheme is not only analytically convenient but is rather reasonable when exploring the effects of tax regimes. There is no apparent coordination between tax authorities and law enforcement authorities. There is hardly a reason to believe that changes in any of these systems would be aligned. Still, it does not follow that a pure income tax that maintains deterrence-neutrality is necessarily preferable to the current U.S. income tax laws. Since costly enforcement implies that under-deterrence is desirable, it is possible that a tax regime that can enhance deterrence will be preferable to a tax regime that maintains (under)deterrence neutrality. Moreover, comparing two tax regimes that differ in their level of deterrence, but also in their level of total revenues is

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<sup>41</sup> The intuition beyond this is as follows. In the pre-tax world, under-deterrence was optimal, because enforcement was costly. If taxation reduces the costs of enforcement, then under-deterrence can be alleviated and enhanced deterrence will be desirable. Put differently, there is no reason to believe that the re-optimized enforcement scheme would involve maintaining deterrence neutrality.

<sup>42</sup> To illustrate, assume that the costs of collecting fines depend on the before-tax, rather than after-tax, fines. Then, a pure income tax will not affect the marginal costs of collecting fines and, in this modified example, it will be efficient. Alternatively, if the costs of collecting fines depend on offenders' wealth or income, then a pure income tax may decrease or increase the marginal costs of collecting fines, depending on whether these costs are marginally increasing or decreasing with wealth or income. These two further examples do not exhaust, of course, the possible impacts of taxation on the costs and benefits of enforcement.

incomplete. Revenue neutrality can be achieved by adjusting tax rates, fines, or some other variable.

An interesting application of the interaction and possible coordination between taxation and optimal enforcement can be found in the comparison of a pure income tax and the current U.S. income tax laws. As showed, the U.S. income tax laws may increase or decrease the pre-tax levels of crime and litigation expenditures, and, in this respect, distort pre-tax behavior. However, because the U.S. income tax laws differ from a pure income tax only in imposing higher after-tax level of fines,  $tf(a)$ , a reduction in the before-tax level of fines by a factor of  $1 - t$  will eliminate any such distortion. Indeed, such adjustments will make these two regimes identical in terms of crime levels and total revenues (tax and criminal fines) collected. Deterrence-neutrality, as already noted, cannot be our goal. Deterrence-neutrality does not necessarily indicate efficiency. Furthermore, once a coordinated adjustment of fines is possible, there is no reason to assume that the probability of punishment cannot be readjusted (re-optimized) as well.<sup>43</sup> Disregarding, for the moment, possible differences in costs of implementation, the choice between a pure income tax and the current U.S. income tax laws is essentially irrelevant: whatever the optimal enforcement scheme is under a pure income tax, the same enforcement scheme will be optimal under the current U.S. income tax laws after deflating the before-tax fine by a factor of  $1 - t$ , and vice versa.<sup>44</sup>

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<sup>43</sup> As noted, Png and Zolt (1989) who demonstrate that a deductibility rule is equivalent to a nondeductibility rule if fines are adjusted properly, implicitly assume that the probability of punishment cannot be altered.

<sup>44</sup> The same will be probably true if we considered also disallowing deductions for litigation costs. Presumably deductibility (nondeductibility) of litigation costs can be neutralized by a direct penalty (subsidy) on litigation expenditures. Moreover, the introduction of taxation may affect the optimal enforcement scheme including the optimal penalty or subsidy on litigation expenses. Given optimal readjustment to the enforcement scheme, the choice between allowing to disallowing deductions for litigation costs is probably irrelevant (disregarding implementation costs).

However, a coordinated model of taxation and law enforcement must take into account the costs of implementing not only law enforcement but also tax regimes as well. Indeed, this paper abstracts from such costs by assuming, for example, that taxes on either legal or criminal income are reported and paid honestly. There is no *a priori* reason to believe in general that the costs of implementing a pure income tax will be identical to the costs of implementing the current U.S. income tax laws with appropriate adjustment to fines.<sup>45</sup> Moreover, there is no *a priori* reason to believe that enforcement costs will be identical under the two regimes.<sup>46</sup> Typical tax models generally ignore the costs of implementation which is the principal crux of optimal law enforcement models. In addition, any comparison between tax regimes should account for possible differences in revenues. Taking all these into account sets the grounds for a joint analysis of optimal taxation and optimal law enforcement.

## 8. CONCLUDING REMARKS

This paper has explored the effects of alternative rules regarding the tax treatment of monetary sanctions and litigation costs on the level of criminal activities and litigation expenses. The key insight of the analysis is that taxation may affect not only the relative expected returns from legal and criminal activities but also the costs and benefits associated with litigation. Due to positive cross effects between criminal activity and litigation expenditures, taxation may generate interesting, counter-intuitive results. Contrary to common beliefs, the current U.S. income tax laws do not necessarily decrease the level of criminal activities or increase the level of litigation expenditures. Because

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<sup>45</sup> Png and Zolt (1989) suggest that it might be less costly to administer a pure income tax.

<sup>46</sup> For example, it is possible that the costs of collecting fines depend on the before-tax fines rather than on the after-tax fines. If so, the current U.S. income tax laws with appropriate adjustment to fines may result in reducing the marginal costs of collecting fines. However, from tax perspective, the cost of implementing a pure income tax may be lower or higher than the costs of implementing the current U.S. income tax laws.

litigation expenditures are deductible, the level of crime may actually rise. Because monetary sanctions are nondeductible, spending on litigation may actually fall. In addition, conditioning the deductibility of litigation expenditures on a successful outcome may not necessarily reduce the levels of crime and litigation expenses. These levels may actually rise if the elasticity of the probability of conviction and punishment with respect to investment in litigation is great than unity. On the other hand, the paper shows that a pure income tax maintains the pre-tax levels of criminal activities and litigation expenditures. Nevertheless, it does not follow that such a tax will be optimal, even if the level of enforcement is set optimally in the absence of taxation. It is likely that the introduction of taxation will require re-optimizing the enforcement scheme.

Several qualifications apply to the results. First, it was assumed that offenders honestly report income derived from legal and criminal activities. This is a strong assumption, in particular when criminal activities are concerned. In this respect, the results should be limited to cases where tax evasion is less of a serious problem, or be interpreted as setting a minimum to the level of criminal activities. Second, it was assumed that the probability of apprehension was exogenous to the model. This, of course, need not be the case. The probability of apprehension might itself be a function of the level of criminal activities and of amounts of resources devoted to reduce the chances of getting caught, namely avoidance cost. Moreover, there might be different rules regarding the tax treatment of such avoidance costs. Third, it was assumed that litigation expenditures do not affect the level of punishment. However, in practice, litigation expenditures may affect directly or indirectly the level of punishment. Taking these possibilities into account may enrich the analysis.

## REFERENCES

- Atkinson, Anthony, and Joseph E. Stiglitz. 1980. Lectures on Public Economics. New York: McGraw-Hill. [97-127]
- Bittker, Boris I. 1974. Taxing Income From Unlawful Activities. *Case Western Reserve Law Review* 25: 130-147.
- Ehrlich, Isaac. 1973. Participation in Illegitimate Activities: A Theoretical and Empirical Investigation *Journal of Political Economy* 81: 521-565.
- Png I.P.L., and Eric M. Zolt. 1989. Efficient Deterrence and the Tax Treatment of Monetary Sanctions. *International Review of Law and Economics* 9: 209-217.
- Polinsky, A. Mitchell, and Steven Shavell. 1984. The Optimal Use of Fines and Imprisonment. *Journal of Public Economics* 24: 89-99.
- Polinsky, A. Mitchell, and Steven Shavell. 1992. Enforcement Costs and the Optimal Magnitude and Probability of Fines. *Journal of Law and Economics* 35: 133-148.
- Polinsky, A. Michell, and Steven Shavell. 1998. Punitive Damages: An Economic Analysis. *Harvard Law Review* 111: 869-962.
- Sjoquist, David L. 1973. Property Crime and Economic Behavior: Some Empirical Results. *American Economic Review* 63: 439-446.
- Slemrod Joes. 2001. A General Model of the Behavioral Response to Taxation. *International Tax and Public Finance* 8: 119-128.
- Tabbach, Avraham. D. 2003. Criminal Behavior, Sanctions, and Income Taxation: An Economic Analysis *Journal of Legal Studies* 32: 383-406.
- Tabbach, Avraham. D. Forthcoming. The Tax Treatment of Crime with Variable Leisure Time *International Review of Law and Economics*.

Zolt, Eric M. 1989. Deterrence Via Taxation: A Critical Analysis of Tax Penalty Provisions. *UCLA Law Review* 37: 343-387.