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Revenge, Tax Informing and the Optimal Bounty

by

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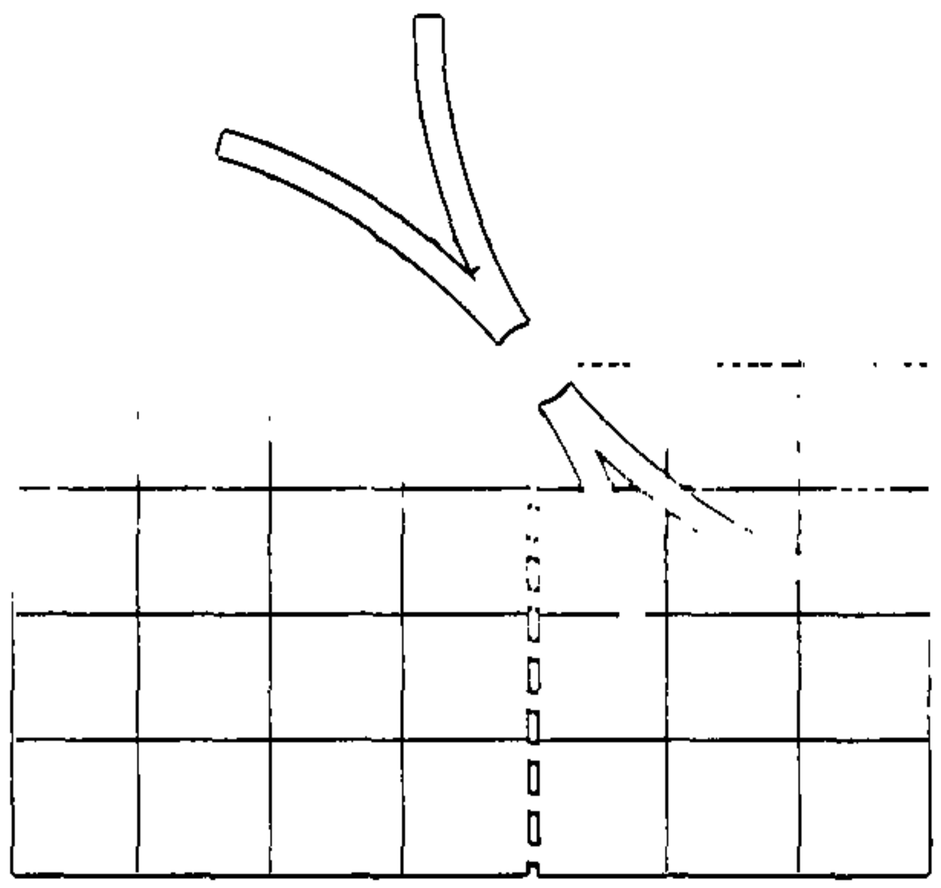

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הלשנה לרשויות המס והגמול האופטימאלי

מאת

גדעון יניב

תמצית

אחד ממקורות חמידע החשובים של רשויות המס (וחביטוח הלאומי) במלחמתם בתופעה של *חעלמת חכנסות* הוא הלשנה של פרטים של שותפיהם לשעבר לחיים או לעסקים, חמונעת, בדרך כלל, מתאוות נקם. אמונח רווחת בציבור חיא שרשויות המס (או חביטוח חלאומי) משלמות למלשינים 10 אחוזים מגודל גביית המס שנבעה מן החלשנה. למעשה, חגמול למלשינים בדרך כלל קטן יותר, ומגיע בארח״ב לפחות מ-2 אחוזים, בממוצע, מן הגבייה חנוספת. מה חסיבה שרשויות חמס כה קפוצות-יד בתגמול מלשינים שסייעו לגבות מסים שאחרת לא חיו נגבים? תשובח אפשרית חיא שחגמול למלשינים חוא אך מחווח צנועה של חערכח כלפי מי שסייע להשיב כספי ציבור. תשובת אחרת חיא שיחא זח פסול מבחינה מוסרית לתגמל מלשינים ברוחב יד, שכן חדבר עלול ליצור תמריץ לפרטים במשק להתמחות כמלשיני מס מקצועיים. חמאמר חנוכחי בוחן את השאלה מנקודת מבט כלכלית. המאמר מציג מודל פשוט של חחחלטה להלשין, שחשלכותיו מוחלות לבעיית רשות חמס של בחירת שיעור חגמול חאופטימאלי ורמת חמשאבים חאופטימאלית שיש להפנות למאמצי חחרשעה של מעלימי חכנסה שחתגלו בעקבות חלשנה. חמאמר מראה, כי רשות מס, חמבקשת להשיא את חכנסותיה חנקיות (לאחר נכוי חוצאות) מחלשנה, תקבע את שיעור חגמול למלשינים ברמה נמוכה יותר ואת מאמצי חחרשעה ברמה גבוהה יותר, ככל שתאוות חנקם של חמלשינים חזקה יותר. אף שיתכן שרשויות חמס מודרכות על-ידי שיקוליים מוסריים בקבען את שיעור חגמול למלשינים, חן פועלות כאילו חן מנצלות במתכוון את דחפי חמלשינים כדי לחשיא את חכנסותיחן מחלשנה. בהכירן את חמניע חאמיתי לחלשנח, רשויות חמס מאלצות את חמלשינים להסתפק בתמורה כספית נמוכה יותר *לטובת מימון מאמציהן להביא לדין את מעלימי החכנסה.*

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REVENGE, TAX INFORMING, AND THE OPTIMAL BOUNTY

by

Gideon Yaniv

ABSTRACT

A common belief is that the IRS pays tax informants 10 percent of whatever their tips produce in revenue. Actually, the bounty rate is even lower, averaging, in recent years, less than 2 percent of the amount of taxes and fines recovered. Why is it that the IRS is so tightfisted in rewarding informants who help recover taxes that otherwise would not have been recovered? The present paper approaches this question from an economic perspective, introducing a simple model of the informing decision, the implications of which are incorporated into the tax administration's problem of selecting a bounty rate, as well as a probability of convicting informed-upon evaders, which maximize its expected net revenues from tax informing. The paper shows that a revenue-maximizing tax administration would set its bounty rate lower and its prosecution efforts higher, the stronger, at the margin, informants' desire to get revenge on former parties with whom they have quarreled. While the IRS may be guided by ethical and moral considerations in designing its bounty scheme, it nevertheless behaves as if it were cynically exploiting informants' emotional drives, cutting down on their fair share in the recovered amounts to help finance its efforts in prosecuting informed-upon evaders.

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I. Introduction

Over the past three decades, economists and psychologists have devoted considerable research effort to the analysis of tax evasion and enforcement, highlighting the role of information in the design of audit policy.[1] Still, a common feature of real-life enforcement, the use of paid informants, has been totally ignored in the tax evasion literature. While not publicly encouraging tax informing, tax administrations often rely on paid informants for the successful conduct of tax investigations. In the fiscal year of 1996, for example, the IRS paid a total of $3.5 million to 650 informants, out of 9,530 who applied for a reward, who provided information that led to the collection of additional $102.7 million in taxes and penalties.[2] To informants, however, the reward is secondary to revenge. The deed is usually done for personal reasons, mostly by disgruntled employees and jilted lovers or spouses.

Most people believe that the IRS pays informants 10 percent of whatever their tips produce in revenue. Actually, the bounty rate is even lower, decreasing at the margin with the amount of taxes and fines recovered.[3] Over the period 1992-96, the bounty rate averaged less than 2 percent of the recovered amounts. Why is it that the IRS is so tightfisted in rewarding informants who helped recover taxes that otherwise would not have been recovered? A possible answer is that the reward is just a modest token of appreciation for helping the state recover public funds. A supporting view is that it is morally wrong for the reward to be too high, as it might constitute an inducement for some people to plan a career as professional tax informants. The present paper approaches this question from an economic perspective, inquiring into the tax administration's problem of selecting a bounty rate, as well as a probability of convicting informed-upon evaders, which maximize its expected net revenues from tax informing.

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[1] For a survey of the tax evasion literature, see Cowell (1990) and Andreoni, Erard and Feinstein (1998).

[2] See Schnepper (1997).

[3] Normally, the IRS rewards informants with up to 10 percent of the first $75,000 in taxes and fines recovered, 5 percent of the next $25,000, and 1 percent of any additional amount. The maximum reward is $100,000, for which the IRS must recover more than $9 million.

The paper begins with introducing a simple model of the informing decision which highlights the role of revenge in generating an incentive to inform.[4] Incorporating the implications of the informant's decision-making model into the tax administration's problem, the paper shows that a revenue-maximizing administration would set its bounty rate lower and its prosecution efforts higher in the presence of a passion to revenge than in its absence. Furthermore, the stronger, at the margin, informants' desire to get revenge on former close parties with whom they have quarreled, the lower will be the optimal bounty and the greater the optimal level of prosecution efforts. While the IRS may be guided by ethical and moral considerations in designing its bounty scheme, it nevertheless behaves as if it were cynically exploiting informants' emotional drives to maximize its expected net revenues. More specifically, because informants' main concern is having their former close parties punished, the IRS apparently takes the liberty of cutting down on their fair share in the recovered amounts to help finance its efforts in prosecuting informed-upon evaders. A supporting evidence of this conclusion is the False Claim Act, under which a whistleblower can commence a civil lawsuit on behalf of the government against persons or companies who have submitted false claims for payment of government funds. This federal law, particularly applicable to cases of health care fraud, allows the government the option of joining the lawsuit. If the government decides to share efforts with the whistleblower, he will receive 15 to 20 percent of the recovered amounts. However, if the whistleblower proceeds on his own, thus saving the government the costs of prosecution, he will receive 25 to 30 percent of the government's recovery.[5]

II. The tax informing decision

Consider an individual who is in conflict with a former close party (henceforth, FCP), such as a business partner, an employer, or a spouse. Suppose that the individual knows that the FCP has failed to declare to the tax agency a taxable income of size Z (or have fraudulently claimed phony exemptions of that size). The individual may thus consider the opportunity

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[4] For a survey of previous studies which combine emotions with the motivation of a material reward to explain behavior, see Elster (1998).

[5] See Vogel (1995).

of taking revenge with the FCP by informing the tax agency about the FCP's tax evasion. With a known probability, λ (<1), the tax agency will be able to use this information to prosecute the FCP and recover the taxes and penalties due, $t(Z)$. Having the FCP convicted and punished will fill the informant with a sweet sensation of revenge, R. Furthermore, the tax agency will reward the informant monetarily by paying him or her a fraction, b, of the amount recovered, providing that he or she was not involved in any way with the tax evasion scheme.[6]

To qualify for a reward, potentially incriminating evidence must be provided to the tax agency. If such evidence is not freely available to the informant, tax informing may involve search costs, s. Moreover, while mainly aiming for revenge, informing may be accompanied by feelings of shame and discomfort, as well as by fear of retaliation,[7] thus involving a psychic cost, k. Assuming that the potential informant is risk-neutral, he or she will decide in favor of informing if the expected gain from informing (EG) exceeds the costs of doing so (S). That is, if

$$EG \equiv \lambda [\delta b t(Z) + R] > \gamma s + k \equiv S, \qquad (1)$$

where δ and γ are coefficients which transform monetary rewards into psychic gains and monetary search costs into psychic costs, respectively. Dividing through by S, and denoting by Ω the expected gain per unit of total cost (EG/S), an incentive to inform may be said to arise if $\Omega > 1$, and not to arise if $\Omega \leq 1$. Notice that an incentive to inform may arise even in the absence of a reward (i.e., even if $b = 0$), providing that R is sufficiently large. Otherwise, a monetary reward will be required to help potential informants come forward.

Tax agencies usually face given tax and penalty functions, specified in the tax laws, having control over b and λ only. The greater the level of b or λ, the greater the value of Ω, thus

[6] The bounty payments may be subject to taxation like any other income. To simplify the exposition, the analysis abstracts from this possibility.

[7] In November 1992, Sherry Kadin informed the IRS that her ex-husband and his second wife were claiming phony exemptions. Her ex-husband paid her back with two bullets in the back of her head. The victims' children sued the IRS for negligently revealing the victim's identity as a confidential informant. In a settlement before trial, the IRS agreed to cover college and other expenses for the victim's two young daughters [Novack (1997)].

the greater the likelihood that an incentive to inform will arise. However, the sensitivity of the incentive to inform to changes in either one of the control variables, reflected through the elasticities $\eta_{\Omega,\lambda}$ and $\eta_{\Omega,b}$, is not identical for b and λ. Specifically,

$$\eta_{\Omega,\lambda} \equiv \frac{d\Omega}{d\lambda}\frac{\lambda}{\Omega} = 1 \tag{2}$$

$$\eta_{\Omega,b} \equiv \frac{d\Omega}{db}\frac{b}{\Omega} = \frac{\lambda\delta B}{S\Omega} < 1, \tag{3}$$

implying that $\eta_{\Omega,\lambda} > \eta_{\Omega,b}$. Hence, an increase in the probability that tax informing leads to the conviction of the informed-about evader will have a stronger effect on the incentive to inform than an equi-proportional increase in the bounty rate. This differential impact arises, however, only in the presence of a passion for revenge, which amplifies the effect of an increase in λ relative to that generated by an increase in b. The sweeter the expected sensation of revenge (i.e., the higher the level of R), the greater will be the gap between $\eta_{\Omega,\lambda}$ and $\eta_{\Omega,b}$, given by $R/(\delta B + R)$.

III. The optimal bounty

Consider an economy where income may take just two levels, high, H, or low, L. Suppose that individuals earning income H can evade taxes by fraudulently declaring that they have earned income L. Suppose further that potential informants vary with respect to the intensity of their passion for revenge and costs of informing. Consequently, some (for whom $\Omega > 1$) will opt to inform the tax agency about their FCP's evasion, and some (for whom $\Omega \leq 1$) will opt avoid informing. An increase in either b or λ will thus induce those for whom an incentive to inform has arisen to come forward. Hence, the total number of informants tipping the tax agency, N, is likely to increase with b and λ. Suppose therefore that the aggregate informing function is given by

$$N = N(b,\lambda), \tag{4}$$

where $N_b > 0$ and $N_\lambda > 0$. Suppose further that the tax agency chooses b^* and λ^* so as to

maximize its expected net revenues from tax informing, *EV*. Assuming that each informant fingers one evader only, so that N also represents the total number of informed-upon evaders, expected net revenues will be

$$EV = [\lambda(1-b)t(Z) - c(\lambda)]N(b,\lambda), \tag{5}$$

where $Z = H - L$, and $c(\lambda)$ denotes the tax agency's cost in prosecuting an informed-upon evader. The higher the probability of conviction sought by the tax agency, the greater the efforts it must devote to the prosecution of an informed-upon evader and the higher its prosecution costs, hence $c'(\lambda) > 0$ and $c''(\lambda) \geq 0$.[8] Notice that *EV* is expressed as a product of the number of informants, $N(b, \lambda)$, and the expected net revenues per informant, $\lambda(1-b)t(Z) - c(\lambda)$. For the latter to be positive, b and λ must have an upper bound, given by

$$b < \frac{t(Z) - \varphi(\lambda)}{t(Z)} \equiv \bar{b}, \tag{6}$$

where $\varphi(\lambda) \equiv c(\lambda)/\lambda$, and

$$\varphi(\lambda) < (1-b)t(Z) \equiv \varphi(\bar{\lambda}), \tag{7}$$

respectively. The first-order conditions for the maximization of expected net revenues are[9]

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[8] A more general formulation of the cost function is $C = C(N, \lambda)$, where $C_N > 0$ and $C_\lambda > 0$, implying that the costs of prosecuting informed-upon evaders increase with both N and λ. For simplicity it is assumed that prosecution costs are proportional N, so that $C(N, \lambda) = c(\lambda)N$.

[9] The second-order conditions for the maximization of expected net revenues are

$$\frac{d^2V}{db^2} = [\lambda(1-b)t(Z) - c(\lambda)]N_{bb} - 2\lambda t(Z)N_b < 0 \tag{8'}$$

$$\frac{d^2V}{d\lambda^2} = [\lambda(1-b)t(Z) - c(\lambda)]N_{\lambda\lambda} - 2[c'(\lambda) - (1-b)t(Z)]N_\lambda - c''(\lambda)N < 0. \tag{9'}$$

Assuming that $N_{bb} < 0$ and $N_{\lambda\lambda} < 0$, conditions (8') and (9') will be satisfied [notice from (9) that the second expression in (9') is negative at the optimum]. The condition on the joint derivative, $(d^2V/db^2)(d^2V/d\lambda^2) - (d^2V/dbd\lambda)^2 > 0$, is assumed to hold.

$$\frac{d(EV)}{db} = [\lambda(1-b)t(Z) - c(\lambda)]N_b - \lambda t(Z)N = 0 \qquad (8)$$

$$\frac{d(EV)}{d\lambda} = [\lambda(1-b)t(Z) - c(\lambda)]N_\lambda - [c'(\lambda) - (1-b)t(Z)]N = 0. \qquad (9)$$

Condition (8) states that b should be raised until the marginal gain in expected tax collections resulting from the increase in the number of informants, $[\lambda(1-b)t(Z) - c(\lambda)]N_b$, equates the marginal cost of paying higher rewards to all informants whose information helps recover taxes due, $t(Z)\lambda N$. Condition (9) is interpreted in a similar way, only the marginal gain from raising λ stems not only from the increase in the number of informants but also from the higher intensity of prosecuting informed-upon evaders, $(1-b)t(Z)N$, whereas the marginal cost is, of course, a consequence of the latter, $c'(\lambda)$.

Dividing through by N and rearranging, conditions (8) and (9) reduce to

$$b = \frac{\varepsilon_b}{1+\varepsilon_b}\bar{b} \qquad (10)$$

and

$$\varphi(\lambda) = \frac{1+\varepsilon_\lambda}{\eta_\lambda + \varepsilon_\lambda}\varphi(\bar{\lambda}), \qquad (11)$$

respectively, where $\varepsilon_b \equiv N_b b / N$ and $\varepsilon_\lambda \equiv N_\lambda \lambda / N$ denote the elasticities of the tax informing function with respect to b and λ, respectively, and $\eta_\lambda \equiv c'(\lambda)\lambda / c(\lambda)$ denotes the elasticity of the prosecution cost function with respect to λ. Condition (10) confirms that the optimal bounty rate is lower than its upper bound, $\bar{b}$. Condition (11) implies that η_λ must exceed unity for the optimal probability of conviction to satisfy (7), hence $\varphi'(\lambda) > 0$ at the optimum.

Because $\bar{b}$ is negatively related to λ, and $\bar{\lambda}$ is negatively related to b, solutions (10) and (11) imply that b and λ are subject to a budgetary tradeoff: the greater the level of resources devoted to the prosecution of informed-upon evaders, the lower the desirable bounty rate, and vice versa - the higher the bounty rate, the lower the desirable level of

prosecution efforts. Substituting (6) and (7) into (10) and (11) and solving for b and λ, the optimal levels of the tax agency's control variables will be

$$b^* = \frac{(\eta_\lambda - 1)\varepsilon_b}{[\varepsilon_{\lambda-b} + \eta_\lambda(1+\varepsilon_b)]} \tag{12}$$

$$\varphi(\lambda^*) = \frac{t(Z)(1+\varepsilon_b+\varepsilon_{\lambda-b})}{[\varepsilon_{\lambda-b} + \eta_\lambda(1+\varepsilon_b)]}, \tag{13}$$

where $\varepsilon_{\lambda-b} \equiv \varepsilon_\lambda - \varepsilon_b$. An immediate first conclusion is that the optimal probability of conviction is positively related to the amount of taxes and fines to be recovered, whereas the optimal bounty rate is independent of the latter.

Section II has shown that because of the passion for revenge, the incentive to inform is more sensitive to changes in λ than to equi-proportional changes in b, the difference being an increasing function of R. Consequently, more potential informants are likely to come forward if λ is increased than if b is raised by the same proportion. Hence, $\varepsilon_{\lambda-b}$ must be positive, implying, in view of (12) and (13), that b^* will be lower and λ^* will be higher in the presence of a passion for revenge than in its absence. Furthermore, the stronger, at the margin, informants' passion for revenge, the greater the magnitude of $\varepsilon_{\lambda-b}$, thus the lower the optimal bounty and the greater the optimal level of prosecution efforts. Because informants' main concern is with getting revenge on their former close parties through having them convicted for tax evasion, the tax agency takes the liberty of exploiting informants' emotional drives, cutting down on their fair share in the recovered amounts to help finance its efforts in prosecuting informed-upon evaders.[10]

Notice finally that because b^* and λ^* are dependent on the magnitude of $\varepsilon_{\lambda-b}$, which reflects informants' passion to revenge at the margin, the optimal levels of the tax agency's

[10]Interestingly, exploiting *tax evaders'* emotions has been suggested by Cowell (1990) as a legitimate weapon for combating tax evasion, arguing that rather than trying to stiffen the legal sanctions, the tax agency should exploit taxpayers' feelings of shame and fear of disgrace by "publicly pillorying the culpable wealthy" (p. 176).

decision variables and the number of informants tipping the agency, $N(b^*, \lambda^*)$, are simultaneously determined. Assuming, for a moment, that informants differ only in the intensity of their passion for revenge but not in their costs of informing, an increase in either the bounty rate or the probability of conviction would induce informants of a weaker passion for revenge to come forward, as the increase in the expected gain from informing would reinforce revenge in generating an incentive for informing. This in turn would drive $\varepsilon_{\lambda-b}$ down, raise b^* and lower λ^*, re-affecting the incentive to inform, the number of informants, and the magnitude of $\varepsilon_{\lambda-b}$. In equilibrium, b^* and λ^* should just suffice to induce informants whose passion for revenge corresponds to the magnitude of $\varepsilon_{\lambda-b}$ which which determines the particular levels of the former - to come forward. An interesting implication of the equilibrium solution is that as long as the passion for revenge plays a role in the determination of b^* [i.e., as long as $\varepsilon_{\lambda-b} > 0$ and $b^* < (\eta_\lambda - 1)\varepsilon_b / \eta_\lambda(1+\varepsilon_b)$], potential informants who are motivated by the monetary award alone will not participate in the bounty scheme. While exploiting the emotional drives of those who seek revenge, the tax agency ends up deterring those who do not.

REFERENCES

Andreoni, J., B. Erard, and J. Feinstein, "Tax Compliance", *Journal of Economic Literature* 36, 818-860, 1998.

Cowell, F. *Cheating the Government: The Economics of Evasion*, MIT Press, Cambridge: MA, 1990.

Elster, J., "Emotions and Economic Theory", *Journal of Economic Literature 36* , 47-74, 1998.

Novack, J., "Boomerang!", *Forbes Magazine*, July 1997.

Schnepper, J.A., *How to Pay Zero Taxes*, McGraw-Hill, 1998.

Vogel, R.L., "Whistleblowers, Bounties and Health Care Fraud", www.fraudbuster.com 1995.

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