International Review of Law and Economics 30 (2010) 10–17

Contents lists available at ScienceDirect

International Review of Law and Economics

Tax fraud by firms and optimal auditing

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ARTICLE INFO

Article history:
Received 26 December 2008
Received in revised form 7 July 2009
Accepted 21 August 2009

JEL classification:
F12
H20

Keywords:
Taxation
Tax fraud
Auditing
Punishments

ABSTRACT

Tax fraud is an issue of increasing importance in China. One particularly significant fraud involves excessive claims for the rebate of VAT on exported goods. This fraud has two interesting features. First, it requires the collusion of an intermediary to supply the false documentation that supports a rebate application. Second, the punishment schedule is convex—with capital punishment used in major fraud cases. These features ensure that the payoff function of a firm engaging in fraud is strictly concave in the level of fraud. This gives a well-defined optimization without the need to appeal to risk aversion. We show that the existence of fraud does not affect the real output decision of the firm nor the tax policy of the government. Audit resources can be used to detect firms engaged in fraud as well as the intermediaries who supply false documents. Under reasonable assumptions it is shown that resources should be focused on detecting firms and not intermediaries. Finally, if the government must take action on fraud a convex punishment scheme is shown to be optimal.

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1. Introduction

In many countries there is growing public concern over issues of tax evasion and fraud in economic activities. Evidence indicates that tax evasion is especially severe in developing and transition economies (Schneider & Enste, 2000). The figures reported by Jia (2002) show that marketization in China has been accompanied by the development of a hidden economy. The economic literature has focused largely upon the evasion of income taxation. In contrast, corporate tax fraud is an important issue in China and a particular concern of its tax system. Tax fraud is a form of economic crime and the source of a potentially serious loss of revenue to the Chinese government.

The Chinese tax system relies on a form of voluntary compliance. Under Chinese law, all taxpayers are required to assist the tax authority by reporting honestly their income and profits and paying a level of tax based on their reported incomes over time. The system is actively enforced by the State Administration of Taxation (SAT) and the Chinese courts which can target investigations and impose substantial penalties for evasion and fraud. In the 2005 tax year the SAT raised revenue of 3086.6 billion Yuan, or 16.93% of GDP. On the other hand, Jia (2002) estimated the revenue lost through evasion and fraud at 444.6 billion Yuan, which was about 35.11% of the total tax revenue of 1266.6 billion Yuan in 2000.

In this paper, we analyze tax fraud in claims for Value Added Tax (VAT) rebates on exported products. This fraud has some especially interesting features from the perspective of tax theory. Producers can claim a VAT rebate on the value of exports, so overstating the value of exports generates an unwarranted rebate. To commit such a fraud one requires a set of supporting documents: a false VAT invoice, a customs manifest, and a foreign exchange settlement memo. A producer committing fraud therefore requires the assistance of another party to supply the documentation. This interaction between the parties is the first interesting aspect of the model. For the VAT fraud the government has a very clear punishment scale with potentially extreme penalties, rising to capital punishment for a sufficient level of fraud. This explicit penalty scheme is the second interesting aspect since it is clearly convex, rather than being the linear fine used in most models of tax evasion.

Many theoretical and empirical studies have addressed the economics of tax evasion. The standard approach was introduced by Allingham and Sandmo (1972) in the context of personal income taxation. They assumed that fines were based on the amount of income hidden by a taxpayer and addressed the determinants of individual income tax compliance. This basic model has been extended in a number of directions which are surveyed in Myles (1995) and Slemrod and Yitzhaki (2000). There is rather less literature on tax evasion by firms. Firms can evade taxation either by misreporting sales or profit, or by making false declarations about input use. It is possible that all these methods may be required

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doi:10.1016/j.irle.2009.08.002

simultaneously to disguise evasion if the information gathering process of the revenue service is sufficiently thorough. The tax evasion decision for competitive firms has been analyzed by Virmani (1989), Yamada (1990) and Cremer and Gahvari (1993). Tax evasion by monopolistic firms has been studied by Marrelli (1984) and evasion by oligopolistic firms by Marrelli and Martina (1988).

Various forms of non-compliance with VAT have been reviewed in Keen and Smith (2006): the authors list under-reported sales, failure to register ("ghost" businesses), misclassification of commodities (as tax-exempt or subject to lower rates) as common for VAT and retail sales tax evasion, as well as forms that are distinct for VAT evasion, such as false claims for credit or refunds, credit claimed on purchases that are not creditable, and bogus traders, or firms set up solely to generate invoices used to recover VAT. Keen and Mintz (2004) show how an optimal VAT schedule can be constructed to balance the tax revenues and collection costs (including both administrative and compliance costs). Das-Gupta and Gang (2003) examine the impact of a particular VAT enforcement technique, namely, matching of purchase and sales invoices, on the enforcement and efficiency of VAT. They find that sufficiently intensive audit can induce truthful reporting but may at the same time distort the purchase–sale and the input–output decisions of the firm. Fedeli and Forte (1999) model a VAT evasion decision as an outcome of bargaining between the firms involved in the VAT chain. In particular, their model predicts that for recovering the lost revenues an increase in the probability of audit is preferable to an increase in the penalty for evasion. Aizenman and Jinjarak (2008) investigate how different political and structural economic factors affect the collection efficiency of VAT in a cross-sectional sample of countries, but notably not including China. In these papers a traditional, consumption-based form of VAT is assumed. The unusual feature of VAT in China is that it is production-based and capital goods are included in the VAT base (Ahmad, Singh, & Lockwood, 2004). Furthermore, China employs a separate export rebate system, with the rebate rates independent of rates paid on creditable inputs. Whalley and Wang (2007) analyze the welfare implications of these two features of the VAT system in China using a monetary trade model and argue that the switch to the traditional form of VAT in China will not be welfare-improving. They emphasize the importance of export rebates in their analysis, but do not address the issue of evasion. A similar study is undertaken in Lin (2008). Fisman and Wei (2001) present an empirical case study of tax evasion in China, with the focus on China's imports from Hong Kong and the evasion of tariffs plus VAT. They show that more revenue is lost for products subject to higher tax rates; furthermore, they find strong evidence of evasion by mislabelling, or misclassification of higher tax products as lower tax products. Our paper contributes to this literature by presenting a theoretical analysis of fraud involving a VAT rebate for export sales.

The analysis of tax evasion by firms faces a difficulty when combining profit maximization with a linear punishment schedule: expected profit is linear in the amount of evasion, so the decision to evade is all or nothing. Marrelli (1984) and Marrelli and Martina (1988) resolve this problem by assuming the owner of the firm is risk averse. A similar approach is undertaken in de Mello (2009). This is acceptable in the context of an owner–manager but does not fit convincingly with wider ownership of the firm's equity. Stöwhase and Traxler (2005) assume instead that there is a cost of evading which is convex in the amount of evasion but do not identify the source of this cost. In contrast, the model we study is necessarily non-linear for reasons entirely explicable for the form of tax fraud we analyze. First, the announced fraud penalty structure is explicitly convex. We detail this in a brief summary of the Chinese VAT system in Section 2. Second, the act of fraud we consider involves the participation of an additional party who must supply false documentation to support the fraud. Section 3 shows how the cost of securing false documentation provides an explanation of the evasion cost used by Stöwhase and Traxler (2005). Section 4 demonstrates that this structure of costs and punishments implies the value of fraud undertaken by the firm is independent of the tax rate. This produces a separation of the government choice problem studied in Section 5 into two distinct components. The first component determines the optimal tax rate, and this rate is unaffected by the existence of fraud. Fraud does not, therefore, imply that the tax rate is distorted from its efficient value. The auditing and punishment policy is a consequence of the second component. If the marginal cost of auditing firms and document suppliers is the same then resources should be focused upon auditing firms, not document suppliers. It is shown in Section 6 that the same conclusions hold under an alternative specification of the punishment structure. Section 7 demonstrates that if there is a limit to the level of punishment that can be exacted for a relatively small amount of fraud then convexity of punishment emerges endogenously as the optimal structure of punishments. Section 8 provides the conclusions and some technical details are presented in Appendix A.

2. Tax rebates

China, like many other countries, encourages exports and provides tax exemptions and other incentives to industries that produce predominantly for the international market. Since 1 January 1994, companies have been able to claim a tax rebate upon exports.[1] The level of refundable VAT is equal to the taxable amount times the unit refund rate. The rate is either 17%, 15%, 13%, 6%, or 5%, depending on whether the products are industrial, electrical, agricultural, or other goods. In 2004 about 219.59 billion Yuan in VAT refunds were claimed (SAT, 2005). More recently, from 1 December 2008, the tax rebates were increased for 3,770 items of labor-intensive, mechanical, and electrical products, or 27.9 percent of the country's total exports. A further increase in the rebate rate took effect from 1 January 2009. Chao et al. (2008) have analyzed the role of the tax rebate in promoting Chinese exports.

To claim a rebate a transaction must be recorded in account books as an export sale. Three basic documents are required to support a claim:

1. VAT invoice: a primary original certificate is required. The goods involved must be subject to VAT.
2. Customs manifest obtained from a customs office. Goods must have passed through customs and have left Chinese territory.
3. Foreign exchange settlement memo: a full set of documents is submitted at a local bank. China practices a foreign exchange settlement system as well as a system of verification and cancellation of foreign exchange receipts from exports.

A falsified claim for a VAT refund occurs through the submission of false documents to the SAT. According to Jia (2002), the purchase of false documentation only costs 2–4% of the VAT invoice from suppliers, and conspiracies to obtain payment of false claims amount to 17% of the VAT refund from the SAT. A first report by the official media on export rebate related investigations showed that the Chinese government may have lost 30 billion Yuan in tax revenue due to fraudulent practices (South China Morning Post, 1 July 2001).

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[1] To claim the rebate the enterprise must be qualified as falling into one of the following eight categories: Manufacturing enterprises with export rights, Foreign trading enterprises with export rights, Industrial and trading enterprises with export rights, Sino-foreign joint ventures with export rights and joint ventures chain enterprises with export rights, Foreign invested enterprises, Enterprises consigning their export goods to other export agents with export rights, Designated tax rebate enterprises and specially authorized tax rebate enterprises.

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