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Tax Enforcement for SMEs: Lessons from the Italian Experience?[†]

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Abstract

The paper aims to provide a detailed description and evaluation of the Italian experience in tax auditing and enforcement for SMEs which we believe may have some lessons for developing countries with similar sized shadow economies and large numbers of micro-enterprises. We focus on an audit strategy known as "*Studi di settore*", which roughly translates as "business sector analyses", which relies on statistical methods to select the taxpayers to be audited. We show how *Studi di settore* can be used as an audit rule or as a presumptive tax and we compare it with optimal audit rules and with alternative presumptive taxes on the basis of the available evidence for Italy. We discuss whether *Studi di settore* may be a useful policy tool for establishing presumptive taxation for SMEs in developing countries when resources for tax auditing are scarce. A presumptive regime may naturally evolve in a full-fledged audit selection mechanism following the development of the private and public sectors.

I. INTRODUCTION

Taxation of small and medium enterprises (SMEs) has always played a prominent role in the Italian fiscal system because, first, the enterprise size distribution is heavily biased towards small and micro-enterprises, and second, the estimated size of the shadow economy is very large compared to other OECD countries and not dissimilar to those of some developing countries (Schneider, 2006). Obviously these two phenomena are intertwined. On the one hand tax evasion is usually very attractive for micro-enterprises as the expected cost of a tax audit may be very low while compliance costs are usually very high. On the other hand, many tax avoidance strategies or even tax frauds make use of non operating firms in order to record fictitious transactions.

During the 1990s taxation of Italian SMEs was the subject of several reforms aimed at reducing compliance costs, increasing compliance and reducing tax avoidance and tax distortions. In this paper we focus on a major innovation in the field of tax auditing of self-employed workers and small firms: "*Studi di settore*" or "business sector analyses".

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The Italian *Studi di settore* (*Sds* hereafter) are based on a highly sophisticated statistical procedure which aims at estimating a reasonable turnover value for self-employed workers and firms with turnovers of less than 5m euros a year. *Sds* provides an estimated turnover for each taxpayer, based on a weighted average of a number of variables (costs and structural variables). The weights depend on the business sector and geographical location. If recorded turnover is below the estimated value the taxpayer has the option of reporting the higher value in his tax return. If this option is not exercised the taxpayer is likely to be audited by the tax administration.

Despite the fact that *Sds* is applied to more than 4 million firms (about 70% of the total) it has been ignored in the international literature (see for example Alm et. al. 2004) which has shown some interest for two methods of presumptive taxation such as the Israelian *Tachsivim* and the French *forfait*. This paper aims to provide a detailed description and evaluation of *Sds* based on the economic theory and other international experience. It will be shown that, depending on the choice of parameters, *Sds* can work as an audit rule or as a presumptive tax. We compare *Sds* with the optimal audit rules proposed by the theoretical literature, and with other forms of presumptive taxation with the objective of verifying whether *Sds* can become a useful model for tax enforcement on SMEs in developing countries with a large shadow economy and by a high percentage of micro-enterprises.

The paper is structured as follows: Section II reviews the literature on the link between tax evasion and firm size. Section III discusses the two main strategies that can be used for coping with tax evasion by SMEs: optimal audit policies and presumptive taxes. Section IV illustrates the relevance of tax evasion by SMEs in Italy and the main features of *Sds*. Section V compares the theoretical properties of *Sds* with those of optimal audit strategies and some popular methods of presumptive taxation; and discusses some of the issues raised by the implementation of *Sds* in Italy. Section VI provides some concluding remarks.

II. FIRM SIZE, TAX EVASION AND THE INFORMAL ECONOMY

The distribution of firm size affects the optimal tax enforcement policy in two ways. First, there can be a relationship between firm size and the propensity to evade or to avoid taxes. Second, the costs and returns of tax auditing may depend on firm size: there are obvious economies of scale in concentrating tax audits on very large firms which usually account for a large share of the potential tax base. This section provides a brief review of the theoretical and empirical literature which investigates the link between firm size and the extent of tax evasion. Issues related to the costs and benefits of different auditing strategies are discussed in Section III.

Firms may pursue several different strategies to escape taxation: they may under-report the tax base, exploit loopholes in the tax system, choose on organizational form with preferential tax treatment or operate outside the formal economy.

Several studies provide theoretical analyses of the choice to underreport income within the classical framework first developed for personal tax evasion (Andreoni et al. 1998), where the trade off is between the immediate gains from tax evasion and the expected value of the penalty. Cowell (2003)[1] proposes a model in which the firm chooses the optimal amount of tax evasion by maximizing expected profits which

[1] For a comprehensive review of the literature see in particular footnotes 22 and 23 in Cowell (2003).

depend on (convex)[2] concealment costs. Among the determinants of these costs, Cowell (2003) includes "the size and organisational structure of the firm" since "firms with a more complex organisation are likely to have higher concealment costs: the more people you bring into the plot the greater the security problem that you face and the greater the risk of discovery". This suggests that a smaller firm with a simpler organisational structure will evade more than a larger firm in relative terms (i.e. that there is a negative relationship between firm size and the propensity to evade).

However, Slemrod (2004) challenged the assumption that the degree of complexity may be viewed on a continuum. He draws a line between tax evasion choices of individuals and "closely-held small businesses whose owners' wealth is generally not well-diversified", where the tax reporting decision is not delegated, and those of "large publicly-held corporations". This distinction leads to two different theoretical approaches. For individuals and small businesses the standard model of utility maximization by risk-averse individuals can be maintained, although it should be enriched by considering "intrinsic motivation (civic virtue, or duty to comply). For large publicly-held corporations one may discard the risk-aversion attitude and should focus on the Principal-Agent relationship between shareholders and managers (this line of research is explored in Crocker and Slemrod, 2005). This may mean that large publicly-held corporations are more or less compliant than small and closely-held businesses, depending on how the incentives within these large companies interact with the penalty structure. Overall, the theoretical analyses developed in Cowell (2003) and Slemrod (2004) suggest that, because of concealment costs, there should be a negative correlation between size and tax evasion only within closely-held corporations.

The empirical literature does not provide any clear-cut conclusions. A number of papers found a negative relationship between firm size and tax evasion: Giles (2000) for New Zealand, Sogei (1999), Di Nicola and Santoro (2001) for Italy, and Batra et al. (2003) and Tedds (2005) for a cross-country sample of firms in developed and developing countries. However, there are some studies that provide evidence of a positive correlation between size and tax evasion, such as Rice (1992) which uses a sample of US firms. It is not clear how to weight this contrasting evidence since these studies are directed towards different countries and time periods, and use different estimation techniques and proxies for the relevant variables (e.g. firm size).

The literature also provides contrasting insights on the relationship between firm size and the extent of aggressive tax planning. Harris and Feeny (2003), for example, argue that the relationship between effective tax rates and firm size is "positive under the political cost hypothesis, where the greater visibility of larger firms exposes them to greater regulatory actions" and "negative if larger firms have greater scope for tax planning". For a group of Australian firms, Harris and Feeny (2003) obtain (although not for all the models they test) a negative relationship between effective tax rate and firm size, which seems to suggest that tax planning is more effective in large firms. However, they also acknowledge (Harris and Feeny, 2003, p. 953, and see the literature quoted there) that "previous results have generally been inconclusive". Further, there is evidence that public corporations often do not exploit available

[2] Convexity is the key assumption to find a positive relationship between output evasion and the level of the proportional tax rate.

avoidance opportunities in order to report higher incomes in their financial statements (Shackelford and Shevlin, 2001).

More solid conclusions can be reached by considering the strategies for reducing the tax burden through the choice of the organizational form. If self employed individuals are considered to be firms, following the EU definition[3], and if standard measures of firm dimensions are used (assets, sales proceeds, number of employees) many self-employed individuals would be included in the category of small firms. A negative relationship between size and propensity to evade would then emerge as the result of the fact that many self-employed people deliberately choose this organizational form over working as dependent employers, in order that they can evade taxes. The reasons for this have been extensively analysed in the literature and were recently summarized by Parker (2003, p. 380, and see there for the relevant literature) as: "when workers can switch freely between two occupations" their preference for self-employment would depend on "the discretion that self-employed workers have in declaring their incomes" as opposed to "the relative lack of discretion by employees who are subject to withdrawal taxes and third party reporting". There is a large empirical literature which documents the high propensity of the self-employed to evade taxes (for a summary of UK, Sweden and Canada see Tedds, 2005; for Italy see Bernardi and Bernasconi, 1996; Bordignon and Zanardi, 1997) even though some scholars have questioned the link between occupational choice and opportunities for evasion (Engstrom and Holmlund, 2006, for Sweden; Parker, 2003, for UK). Cultural and historical factors have been suggested as some of the reasons explaining high levels of tax evasion among the self-employed in transitional countries (see Engelschalk, 2004).

The behaviour of microenterprises and the self-employed is crucial for understanding the link between firm size and tax enforcement in developing countries. According to Burgess and Stern (1993, p. 798-799), "information on incomes, production, transactions, property records and inheritances is notoriously difficult to obtain in developing countries .... For some, evasion may be relatively passive in that there is little attempt by the government to impose the tax. This is especially the case for the self-employed ... as the gathering of information on the incomes of such individuals is difficult and costly. For similar reasons many small enterprises remain invisible to the tax authorities". More recently, Auriol and Warlters (2005, p. 626) argued that the presence of many small-scale enterprises is one of the features that can be "grouped together by the observation that developing countries have large informal sectors that are difficult to tax".

Empirical analysis in this field is difficult; it is arduous to collect comparable data on the size of the shadow economy and the share of small firms in the economy. Ayyagari et al. (2005) recently provided data on the share of employment in SMEs in 76 countries for the period 1990-1999. By merging this dataset with the estimates on the shadow economy labour force in Schneider (2000) the authors found a strong negative correlation between the size of the informal economy and GDP, and a strong positive correlation between income level and the importance of SMEs leading to their conclusion that “while a greater share of the micro enterprises are in the formal sector

[3] According to the European Union, a firm ”is considered to be any entity engaged in an economic activity, irrespective of its legal form. This includes, in particular, self-employed persons and family businesses engaged in craft or other activities, and partnerships or associations regularly engaged in an economic activity”.

in developed countries, the aggregate contribution of small enterprises (both in the formal and informal sectors) to GDP and manufacturing varies little if at all with the level of economic development".[4] This suggests that SMEs in the informal sector are the main contributors to the shadow economy in developing countries.

III. AUDIT POLICIES AND PRESUMPTIVE TAXES IN DEVELOPED AND DEVELOPING COUNTRIES

The literature distinguishes between two main approaches to coping with tax evasion: optimal audit rules and presumptive taxes. There are two main models of optimal audits (Andreoni et al., 1998): the Principal-Agent model for the commitment case (i.e. when the Tax Agency can commit to the audit rule) and the Game-Theoretic model for the non-commitment case. In both, the basic problem for the Tax Agency is that audits are (to some extent) useful, since they are necessary to generate compliance, but they are also costly. Therefore, the Tax Agency is assumed to maximize net tax revenues by taking into account the choices made by the rational (and usually risk-neutral) taxpayer. The way that the Tax Agency and taxpayers interact depends on whether the Tax Agency can commit to its audit rule before the taxpayers make their reports. If it can (and this is both a legal and political matter), then the optimal rule typically involves a threshold: all taxpayers reporting an income lower than a given level will be audited, while those reporting a higher level will not. If there are no concealment costs (or if they are unknown to the Tax Agency), the best that the Tax Agency can do is to conduct a number of audits sufficient to generate truthful reporting by all taxpayers below the threshold. Taxpayers above the threshold, however, can all report at the threshold and evade the difference between their true income and the threshold. This system is efficient, since it maximizes expected revenue, but clearly generates a *regressive bias*.

If the Agency cannot commit, then the optimal rule emerges as the equilibrium of a full-information sequential game. If the equilibrium is the fully separating one, in which each observed report is associated with a single true income level, all taxpayers evade taxes by the same amount and the audit rule is the solution of a linear first-order differential equation. Many other (pooling) equilibria are possible. The main problem here is that these models seem to provide a rather poor description of real-world audit policies.

We do not know very much about the audit policies actually followed by Tax Administrations and Tax Agencies since, in general, national administrations do not disclose this information.

An exception is the US, whose audit policy is based on the so-called DIF (discriminant index function) score method (Stadler and Castrillo, 2002, footnote 5; Andreoni et al., 1998, p. 820). The initial information is provided by the Taxpayer Compliance Measurement Program (TCMP) which is a program of intensive audits conducted on a stratified random sample of returns by individual taxpayers. The DIF is a computer-generated score to predict returns most likely to result in additional taxes owed if audited. The percentage of audits which are based at least in part on the DIF score, ranges, according to different sources, from one-half to two-thirds of the total. It is important to note that US taxpayers are aware of the use of this statistical

[4] Ayyagari et. al. (2005) p. 9.

method in selecting taxpayers to audit, but the exact equation of DIF is not known to them.

An alternative approach to coping with tax evasion is presumptive taxation, which is based on the use of indirect means to ascertain the tax liability which differ from the usual rules based on the taxpayer's accounts (Thuronyi 1998). Following Bulutoglu (1995) these methods can be classified into four categories: 1) methods that estimate the taxpayer's income based on the nature of the business and information on sales, employees, assets, location, etc.; 2) methods that impute a return on business assets; 3) methods that apply a gross receipts or turnover tax; 4) methods that estimate the taxpayer's income on the basis of external indicators such as personal expenditure, wealth, etc..

Presumptive methods are often advocated in the taxation of SMEs with the aim of reducing the cost of compliance and to educate taxpayers to deal with the tax system, in the hope that this may reduce the incentive to operate in the underground economy. In this case they are usually enforced as "simplified tax systems", i.e. they replace a number of taxes normally levied on business. Bird and Wallace (2004) and Araujo-Bonjean and Chambas (2004) show that simplified systems are widely used for SMEs in developing countries in Central and Latin America (Mexico, Bolivia and Uruguay) and Africa.

In addition to very simple methods, such as fixed payments based on profession and trade ("*patente*" in francophone countries) or on turnover, there are two rather more sophisticated methods that have received attention in the literature and have been implemented in developing countries: the Israelian *tachshiv* and the French *forfait* (Araujo-Bonjean and Chambas, 2004, Bird and Wallace, 2004 and Thuronyi, 2005).

The *tachshiv* (Fausto, 1990) is based on two steps. First, firm turnover (sales proceeds) is estimated on the basis of some pre-defined indicators, such as average sales per worker, or average ratio between the inventory and sales. These indicators are then applied to various firm variables (e.g., number of workers, inventory amounts) to obtain an estimation of a *range* of values for the firm's turnover. Second, a range of plausible pre-tax gross income is estimated by subtracting a presumptive amount of expenses from the estimated turnover. Different expenses receive differential treatment depending on the difficulty involved in auditing them, such that presumptive coefficients tend to be applied more extensively to expenses that would be more difficult for the tax auditors to verify. The *tachshiv* is differentiated across economic sectors and, to some extent, it is negotiated between the Tax Agency and each industry's representatives. It is designed to be an instrument for the tax auditors and, thus, an audit strategy. However, to the extent that taxpayers tend to converge within the *range* of presumed income, the *tachshiv* could also be interpreted as a method of presumptive taxation (Thuronyi, 2004).

The French *forfait* (Thuronyi, 2004; Longobardi, 1990) is a method of presumptive taxation applicable only to SMEs with an annual turnover below a specified amount. Its most important feature is that it is a contractual method, i.e. it is used to help the Tax Agency and the taxpayer to reach a consensus on the amount of taxes. The first step in the procedure is the furnishing by the taxpayer of a number of pieces of information concerning amounts of sales, purchases, inventories, number of employees in previous years, etc.. The Tax Agency uses this information and some statistical information concerning general business expenses (based on special

monographies par profession), to formulate a proposal or *forfait* based on "income that a firm would normally produce" under the same economic conditions. Finally,the forfait is implemented. This implementation involves a large degree of discretion on the part of the tax auditors, since they can modify the *forfait* to take account of the individual features of the tax payers. If no agreement is reached, the taxpayer can appeal against the *forfait* - first to the Tax Commission, whose members include business representatives – and then to the Administrative Court.

As pointed out by Bird and Wallace (2004) the critical issue is whether these presumptive methods of taxation are really effective first in bringing firms into the formal economy and then, after few years, forcing them to move into the normal tax system, while minimizing the number of firms that move from the normal tax regime into the simplified one. The main problem is that these objectives are to some extent inconsistent. To be attractive for informal firms the methods need not only to be simple and based on readily available information to reduce compliance costs (as stressed by Araujo-Bonjean and Chambas, 2004), they should also provide for an effective taxation that will be lower than that based on the normal tax rules. However, this would discourage firms from ever moving into the normal tax regime and attract firms that were in the formal sector to move to the presumptive regime, resulting in loss of revenue to the Tax Authority. One solution to this conundrum might be a periodical revision of the threshold for eligibility for the simplified regime. Alternatively, a time limit could be applied for eligibility for the simplified system for individual taxpayers, or the presumptive tax system could be gradually phased out. However, as highlighted by Bird and Wallace (2004), only few countries set a limit on the number of years that a firm can qualify for the simplified regime. It seems, therefore, that the transition from the simplified to the normal tax regime is one of the main limitations of presumptive taxation.

IV. TAX EVASION AND AUDIT POLICIES IN ITALY

The estimated size of Italy's shadow economy is very large and not very different from estimates reported for some developing countries (Schneider, 2006). Recent figures provided by the Italian Tax Agency (Agenzia delle Entrate, 2006) confirm the magnitude and relative stability of cumulative tax evasion in Italy. Tax evasion, as a percentage of GDP, ranged between 20% and 25% during the 1980s and the mid 1990s. Since then it has been declining, although the absolute value estimated for 2002 (17.49%) is still very high.

It would be difficult to summarize here all the attempts that have been made to fight tax evasion in Italy. However, we can distinguish at least two periods. In the eighties penalties became harsher and even imprisonment could result from tax evasion. Special laws (the so-called handcuffs for evaders - "manette agli evasori") were passed and the emphasis was put almost exclusively on traditional instruments, i.e. random audits and sanctions. However, the results of this approach have been judged unanimously to be deceptive. Few people were caught out evading tax, and a number of legal suits were brought and won by taxpayers. It became clear that the peculiar structure of Italian businesses where the enterprise size distribution is heavily biased towards small and micro-enterprises was a crucial factor. The number of small and medium sized firms continued to increase and this progressively reduced the deterrence of random audits. As a result, tax evasion continued to increase. The second period began in the nineties when a new approach was endorsed based on

heavier reliance on statistical methods to select taxpayers to be audited. It was within this perspective that *Sds* was conceived.

Before providing a detailed description of this audit method is it useful to provide some data on the incidence of SMEs in the Italian economy and on their alleged contribution to tax evasion.

SMEs and tax evasion in Italy

It is well known that one of the peculiar features of the Italian economy is the large share of SMEs. In Ayyagari et al.'s (2005) database, Italy is ranked 8th among 53 countries by share of employment in firms with less than 250 employees. What is perhaps less widely acknowledged is the relevance of micro-enterprises and self-employment, which is the most striking feature of the Italian non-financial business economy. Table 1 reports data provided by a recent Eurostat study (Schmiemann, 2006) for the EU-25 in 2003, on the relative shares of SMEs[5] in employment, turnover and value added in non-financial business activities.

[5] According to the European Union "the category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million". Within the SME category, a small enterprise is defined as an enterprise which employs fewer than 50 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million. Also, within the SME category, a microenterprise is defined as an enterprise which employs fewer than 10 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million.

TABLE 1: RELATIVE SHARES OF SMES IN EMPLOYMENT, TURNOVER AND VALUE ADDED IN NON-FINANCIAL BUSINESS ACTIVITIES

	EU-25	AT	BE	CZ	DE	DK	ES	FI	FR	HU	IT	LT	LV	NL	PL	PT	SE	SI	SK	UK
Number of persons employed																				
Micro (1-9)	29.8	25.1	29.0	32.6	19.6	19.6	38.6	21.5	23.3	35.9	47.1	17.7	20.6	28.9	40.5	39.7	24.3	27.3	12.5	21.1
Small (10-49)	20.8	:	:	18.6	21.9	24.9	25.8	19.2	20.7	18.6	22.0	26.1	27.1	:	11.5	23.6	:	17.3	14.6	17.9
Medium (50-249)	16.5	:	15.9	17.8	18.7	:	14.7	18.5	16.9	16.3	12.4	27.1	26.2	18.6	18.3	17.6	17.0	:	22.2	14.8
Large (250+)	32.9	:	:	31.0	39.8	:	20.9	40.9	39.2	29.2	18.5	29.1	26.1	:	29.6	19.1	:	:	50.7	46.2
Turnover																				
Micro (1-9)	19.4	:	22.8	19.4	12.3	21.4	25.3	15.6	20.0	21.1	29.0	11.9	17.6	16.4	25.3	:	:	:	12.7	15.4
Small (10-49)	19.3	:	21.4	19.9	16.0	22.9	24.2	15.6	19.4	19.0	22.4	25.7	30.5	22.2	14.5	:	:	:	15.9	16.3
Medium (50-249)	19.2	:	20.6	21.6	19.1	21.6	19.2	19.8	17.2	18.6	18.6	25.0	29.6	24.5	22.1	:	:	:	19.8	18.0
Large (250+)	41.9	:	35.3	39.1	52.6	34.1	31.3	48.9	43.4	41.2	30.0	37.4	22.4	36.9	38.1	:	:	:	51.5	50.3
Value added																				
Micro (1-9)	20.5	18.9	19.3	20.4	15.6	23.4	26.8	18.1	19.6	17.2	31.7	9.2	:	:	16.0	22.5	17.6	19.2	11.7	17.9
Small (10-49)	19.1	:	:	17.1	18.3	21.2	24.5	16.0	18.2	16.2	22.4	21.8	25.6	:	11.0	21.0	:	17.6	12.3	16.1
Medium (50-249)	17.8	:	19.0	19.3	18.6	:	17.1	19.0	16.0	18.4	16.3	25.3	27.6	:	21.4	21.9	19.1	:	17.6	16.5
Large (250+)	42.7	:	:	43.2	47.6	:	31.6	46.8	46.2	48.2	29.6	43.6	:	:	51.7	34.6	:	:	58.3	49.4

Source: Schmiemann (2006). See source for data description and limitations

It can be seen that Italy is the European country with the largest share of employment in firms with less than 250 employees with a value equal to 81.5% against a European average of 67.1%. Spain and Portugal display a similar pattern, with shares of 79.1% and 80.9% respectively. But the difference with the rest of Europe is even more clear when we consider the bottom of the distribution, Italian firms with less than 10 employees. Micro-enterprises and self-employed account for 47.1% of total employment in the non-financial business economy in Italy, a value which is significantly higher than both the European average (29.8%) and the share of employment in micro-enterprises in Spain and Portugal. The same study highlights:

> the role of micro enterprises in distributive trades, real estate, renting and business activities …, construction and hotels and restaurants in Italy. In all four of these activities, micro enterprises in Italy provided an absolute majority of sectoral value added and up to two thirds of the workforce (with their share of total employment ranging between 58% and 67%)(Schmiemann, 2006, p. 3)

Tax evasion is not monitored on a regular basis. However, the available evidence shows that Italian SMEs evade extensively. The most comprehensive and up-to-date source is the study by Sogei (1999), the company managing the tax database on behalf of the Italian Ministry of Finance, which was published in 1999 and refers to the period 1990-1994. This study estimates the unreported taxbase for both VAT and (personal or corporate) Income Tax by comparing national accounts with fiscal data. With reference to Income Tax the results are disaggregated on the basis of firm size. According to Sogei (1999), estimated total income unreported by firms with less than 20 employees, and by self-employed for the period 1990-94, is in the range ITL 250 to 280 billions at current prices. These figures correspond to a fraction between two-thirds and three-quarters of the (estimated) true income of the selected subset.

Other studies obtained similar results. For the fiscal year 1991, Bernardi and Bernasconi (1996) estimate that 58.7% of tax is evaded (or legally avoided) by individual entrepreneurs, self-employed and other unincorporated companies. Aggregate results appear to be of a similar magnitude, even adopting an approach based on random samples. For the fiscal years 1987 and 1989 Bordignon and Zanardi (1997) use a sample of approximately 120,000 audits of the self-employed of which 84.3% are found to have evaded income taxes. Average unreported income amounts to approx. 55% of the (supposedly) true income, varying across economic sectors and other variables. Di Nicola and Santoro (2001), using a sample of approximately 500 audits of income reported for fiscal year 1999, found that corporate taxes were evaded by two-thirds of the sample, and that this proportion increased among small corporations.

Indirect evidence on the high propensity for SMEs to evade taxes is also given by the significant variability of tax evasion estimates across economic sectors. The Italian Tax Agency (Agenzia delle Entrate) has evaluated both the diffusion and the intensity of tax evasion in fiscal year 1998 (Agenzia delle Entrate, 2006). Diffusion is measured as the tax gap, i.e. the difference between the tax paid and that estimated on the basis of national accounts. Intensity is taken simply as the ratio between the tax gap and the value added, calculated on the basis of national accounts. Both diffusion and intensity are very high in sectors with a large share of micro-enterprises. Evasion is estimated to be highly diffused in services to companies, wholesale traders, services to families (social and educational services), transport, restaurants and hotels. The 'top five'

sectors for intensity of tax evasion are similar: agriculture and fisheries, restaurants and hotels, services to companies and services to families.

The Italian Studi di settore: a description

The Italian *Sds* is a mechanism of audit selection based on a (quite sophisticated) statistical procedure which signals firms reporting an "implausibly low" level of turnover with respect to that reported by firms with similar economic features. The *Sds* was introduced in 1988, after lengthy debate. Since then, its importance has grown progressively, and in fiscal year 2004 70%, i.e. about 4 million, of Italian firms were eligible to be audited on the basis of *Sds*.

We now describe the main elements of a typical *Sds*. Its basic element is the cluster, i.e. a subset of economically homogeneous firms. Initially, data are collected from all firms (corporated and unincorporated companies, single entrepreneurs, self-employed) that report similar activity codes (these are listed by Istat, the national institute of statistics) and annual turnover under 5,164,569 euros. Data include structural variables (surface area of offices and warehouses, number of employees, type of customers) and accounting variables (mainly costs).

Principal components analysis (PCA) is applied in order to select structural variables that are statistically the most significant from all those collected. These variables are then used to form the clusters. More precisely, this means that all firms belonging to the same cluster are homogeneous with respect to the structural variables selected by PCA. However, a single firm may belong to more than one cluster, for each given probability, and in this case the firm is said to have a mixed profile.

Having defined the concept of a cluster we now briefly illustrate how *Sds* actually works. The *Sds* may generate two kinds of audits. First, the firm may be audited if it reports a level of sales proceeds (turnover) which is lower than an imputed level, less a confidence value, but not audited on the basis of the *Sds*[6] if it reports a level of sales proceeds which is at least equal to the imputed level less a confidence value. If recorded turnover is below the estimated value the taxpayer has the option of reporting the higher value in his tax return. The imputed level of sales proceeds is calculated as the product of a vector of values reported by the firm, and of their corresponding parameters. The values refer to a set of independent variables, which are statistically associated with sales proceeds, i.e the relevant independent variables. The parameters reflect the average relationship between the relevant independent variables and turnover, for a subset of firms belonging to the same cluster and satisfying a given 'consistency criterion'. This criterion is based on the cumulative distribution of indicators such as the value added per worker, the inventory turnover and the ratio between sales and the book value of capital assets[7].

In the second kind of audit, the firm may be audited if it reports values of the relevant independent variables that are too far removed from those reported by the other firms in the cluster. Or, the firm may be audited if it does not satisfy the consistency criterion for its cluster.

[6] It might be audited on the basis of a criminal investigation or of a random audit which is not based on the study of sector.

[7] More precisely, firms having values of these indicators which belong to the tails of distributions are considered inconsistent. The cut-off values are defined for every cluster.

V. POLICY EVALUATION

In this section we try to evaluate *Sds* as a feasible policy for developing countries, aimed at comparing tax evasion by small and medium sized firms. We first compare the *Sds* scheme with optimal audit schemes and presumptive taxes. Then we consider the implementation problems experienced in Italy.

Comparison with optimal audit procedures and presumptive taxes

We now compare *Sds* with the alternatives illustrated in Section III by abstracting away from some of the problems that arose in the implementation of *Sds* in Italy. We make three assumptions, that will be discussed in the succeeding sub-section.

First, we have seen that *Sds* is based on reported sales proceeds (turnover) rather than on reported income. This is clearly inefficient and it violates the Revelation Principle: since taxes are paid on income, there is an incentive-compatible direct mechanism which allows the Tax Agency to induce the firm to reveal its true income. To overcome this, here we assume that *Sds* is applied to reported income rather than to reported turnover.

Second, in this section we consider only the first kind of audit described in previous sections i.e. we implicitly assume that the second kind of audit is efficiently administered, so that the vector of independent variables is correctly reported.

Third, although we can see that the parameters are endogenous, we treat them here as exogenous, since the Tax Agency has some degrees of freedom in the formulation of the consistency criterion.

In the modified version of *Sds* that we consider in this section, the firm knows that it will be audited with a given positive probability if it reports an income $\hat{y}_i$ lower than an imputed level $\beta \hat{x}_i$ where β is (treated here as) a vector of exogenous parameter, while $\hat{x}_i$ is a vector of the (independent) variables reported by the firm. The firm that reports an income $\hat{y}_i \geq \beta \hat{\mathrm{x}}_{\mathrm{i}}$ knows that it will not be audited on the basis of the *Sds* (although it might be audited on an another basis). As the optimal audit procedure with commitment described in Section III, the audit selection is thus based on a threshold. However, there are three main differences between the two kinds of threshold.

First, the *Sds* threshold is a relative rather than an absolute value, If $\hat{x}_i$ is considered as a vector of variables measuring the potential profitability of the firm, such as the square metres of office space or the total value of assets, and β is taken as a kind of profitability parameter, it could be said that the *Sds* threshold distinguishes between more profitable and less profitable firms while the absolute threshold of the optimal audit distinguishes between rich and poor firms.

Second, the variable $\hat{x}_i$ depends upon the economic features of the firm, namely its economic activity (sector or, more precisely, cluster). This is a sort of application to firm taxation of the idea of audit classes, which usually refers to personal taxpayers rather than firms (Scotchmer, 1987) and makes the Italian *Sds* similar to Israel's tachshivim described above.

Third, the variable $\hat{x}_i$ is a vector of the variables selected via a political process, where the Tax Agency deals with the different business sector representatives. Thus, we can say that the *Sds* are audit selection criteria based on an endogenous and politically-generated threshold.

Let us now focus on the firm's behaviour and, consequently, on the expected (gross) revenue for the Tax Agency. The expected tax (ET) for the single firm *i* is given by

$$ET_i = t(\hat{y}_i) + (1+f)q(\hat{y}_i)[t(y_i - \hat{y}_i)] \tag{1}$$

where *f* is the fine if caught evading tax, *q* is the probability of an audit and y_i is the "true" income. If $t' \geq 0$ and there is no tax rebate for overreporting, it is clear that the firm will never overreport income, i.e. $\hat{y}_i \in (0, y_i)$ and that it will report no income if the penalty or the probability of audit are too low, i.e.

$$q < \frac{1}{(1+f)} \Leftrightarrow \hat{y}_i = 0 \tag{2}$$

independent of the value of βx_j. This corner-solution is highly unrealistic, but note that, for our purposes, things would not change dramatically if there were a cost for concealment (Cowell, 2003), which would possibly generate a positive solution.

So, in order to achieve positive expected (gross) tax revenue the Tax Agency must choose the following audit rule:

$$\begin{aligned} q(\hat{y}_i) &= \frac{1}{(1+f)}, \hat{y}_i < \beta\hat{x}_i; \\ q(\hat{y}_i) &= 0, \hat{y}_i \geq \beta\hat{x}_i \end{aligned} \tag{3}$$

If this audit rule is publicly disclosed, and provided that the Tax Agency makes a credible commitment to ex-post implementation of this rule, a firm with an income lower than the imputed level, i.e. $y_i < \beta\hat{x}_i$, will find it rational to report the true income, i.e. it will report $\hat{y}_i = y_i$ and pay a tax equal to $t(y_i)$. Under the audit rule (3) underreporting would generate the same expected tax, and we can assume that the firm will not evade if there is no positive gain for lying.

On the other hand, a firm with an actual income higher than the imputed value, i.e. $y_i \geq \beta\hat{x}_i$, will find it rational to report $\hat{y}_i = \beta\hat{x}_i$ and to evade $y_i - \beta\hat{x}_i$. with $ET_i = t(\beta\hat{x}_i)$. To see why, just consider that reporting any value $\hat{y}_i < \beta\hat{x}_i$ the firm would have $ET_i = t(y_i)$.

As a consequence the Tax Agency will collect tax on the actual income for all firms with an income higher than imputed, i.e. with $y_i \leq \beta\hat{x}_i$ and a tax on imputed income for all firms whose true income is lower than imputed, i.e. with $y_i > \beta\hat{x}_i$.

This result is very similar to that predicted by optimal audit theory. The main difference is that optimal audit theory suggests a threshold defined by income: firms with an income below the threshold $\bar{y}$ are audited and report their true income while

firms above the threshold are not audited and report an income equal to $\bar{y}$. As a consequence expected revenues depend on the distribution of actual income. In *Sds* the threshold is set at the difference between actual income and imputed income $d_i = y_i - \beta\hat{x}_i$, which can be taken as a measure of profitability: unprofitable firms, i.e. with a negative d_i, will report their true income and will be audited while profitable firms, i.e. with a positive d_i, will report the imputed income and will be not audited. This implies that revenues will depend on the distribution of profitability, which, in turn, depends on the vector β.

Given that the audit rule implemented through *Sds* is different from the optimal audit rule, expected revenues are not maximized. It will be the case that some poor firms, which should be audited under the optimal rule, will not be audited on the basis of *Sds* since they are highly profitable, and that some rich firms which should not be audited under the optimal rule will be audited on the basis of *Sds*, since they are not very profitable. However, the efficiency loss may be justified on equity grounds as the auditing rule based on profitability may avoid the regressive bias usually associated with any exogenous threshold (see Section III). This gain of equity does not require more information, since any optimal threshold would require estimation of the cumulative distribution of the variable y which is not observable directly through the tax reports.

In sum, an audit strategy based on *Sds* is potentially more equitable but also less efficient compared to an optimal audit strategy. The loss in efficiency varies directly with the degree of correlation between profitability and the absolute amount of profits.

At a first sight *Sds* may seem inappropriate for developing countries, which usually lack the resources needed to implement sophisticated audit schemes. As we saw in Section III, they rely heavily on presumptive taxation. However, it is evident that the lower the values of β, the lower will be the threshold for each firm and the higher will be the percentage of taxpayers paying taxes on imputed rather than actual income, making *Sds* appear very much like a presumptive tax. Furthermore, *Sds* is more flexible than standard presumptive systems and this may be very advantageous. As we saw in Section III a critical issue with presumptive systems is the transition from a simplified regime to a normal one. In theory this transition can be managed within *Sds* simply by gradually revising the parameter β. A country with a weak tax administration may start to apply *Sds* with low β to minimize the cost of auditing. As the tax administration becomes stronger and firms become more accustomed to regular book keeping the β can be gradually raised, transforming *Sds* from a presumptive regime into an auditing strategy.

Next we briefly compare the Italian *Sds* with the French forfait and the Israeli tachshivim. With respect to the French forfait, the advantage that *Sds* seems to offer is that the tax officers' discretion is limited, since the audit rule is committing and no taxpayer can be audited if he is above the threshold. This would seem to be interesting for developing countries where corruption among tax officers is widespread.

The main difference between the Italian *Sds* and the Israeli tachshivim is that the latter is not used to determine a presumptive amount of tax to be paid by an individual taxpayer. In a given tachshiv it is the *range* of gross income for a given economic sector rather than a presumptive income that is estimated. This makes the Israeli

tachshiv less similar to a presumptive method of taxation and thus, perhaps, less attractive for developing countries.

Implementation Issues

In terms of the implementation of *Sds*, the estimation of the relevant distribution function is necessary, in principle, for both optimal audit procedures and for *Sds*. However, in both cases it is expected that rational taxpayers that find themselves above the threshold will converge toward the threshold. Therefore, the lower the threshold the more *Sds* or other committing audit strategies will resemble a presumptive tax and the importance of determining the exact shape of the distribution function becomes less dramatic. In an optimal committing audit strategy, reducing the threshold does not violate optimality if the budget allocated for audits is reduced accordingly. In general, this is true for *Sds*. However, *Sds* relies on an endogenous rather than an exogenous threshold definition. The Italian experience shows that several difficulties can arise from this choice.

There are three main problems. First, the threshold refers only to turnover not to income. Second, the threshold depends on β, which in turn depends on the way the consistency criterion is designed. Third, the threshold depends on $\hat{x}_i$ which, if the second type of audit is not efficiently run, can be manipulated by the taxpayer.

Data about firms actually audited on the basis of the studies of sector are not publicly available. However, it is known that the percentage of firms with a recorded level of turnover lower than the threshold – and that will be subject to a tax audit if they do not exercise the option to report a turnover equal to the threshold –decreased over the entire period 1998-2003, and then increased in 2004 (Agenzia delle Entrate, 2007, see Table 2).

TABLE 2: PERCENTAGE OF ITALIAN FIRMS AUDITABLE ON THE BASIS OF *SDS* (FIRST TYPE OF AUDIT)

Year	Percentage of auditable firms^
1998	51% (51%)
1999	47% (47%)
2000	40% (42%)
2001	37% (40%)
2002	33% (36%)
2003	29% (33%)
2004	31% (35%)
^ in parentheses the % of firms auditable among those for which the *Sds* was enacted since 1998 (approx. 40% of total)	

At a first sight this trend would seem to confirm the effectiveness of *Sds* in inducing tax compliance as over time firms have increased their average levels of recorded turnover. However, there is some evidence that the decrease in auditable firms is also driven by other factors.

First, evading firms may have reacted to *Sds* by reducing their underreporting of sales while at the same time increasing their overreporting of costs. This phenomenon has been documented by Agenzia delle Entrate (2007) for the restaurant sector where average turnover increased by about 8% in the period 1998-2003 while income

decreased by about 22%. Indirect evidence of the problem is provided by the effects of a revision of *Sds* for a number of sectors in 2004. This revision introduced an evaluation of the level of reported value added in order to link turnover to income. As Table 2 shows, the revision coincided with a break in the downward trend in 2004. Further, Agenzia delle Entrate (2007) reports that between 2003 and 2004 the turnover reported by a sample of taxpayers subject to the revised *Sds* increased by 3.5% and reported income increased by 4.3% while for taxpayers subject to the old *Sds* turnover increased by 3.3% and income by 1.9%.

The second explanation for the observed decrease in the percentage of auditable firms is related to the method used to estimates parameters. In Section IV we showed that these parameters measure *average* relationship between turnover and the vector of relevant independent variables for a subset of firms belonging to the same cluster and satisfying a given 'consistency criterion'. More precisely, they are estimated by running a regression of turnover on independent variables limited to 'consistent firms' on data reported by the firms themselves. To the extent that firms manipulated the reported data to pass the consistency test, increasing the subset of firms used for the regression, the estimated average relationship (regression coefficient for the subset of consistent firms) had converged to the average relationship reported in the whole set of firms belonging to the same cluster. As a result it became easier for all firms in a given sector to meet the threshold for turnover. Evidence of this problem is provide in Table 3 which shows how the percentage of inconsistent firms steadily decreased in the period 1998-2001.

TABLE 3: PERCENTAGE OF ITALIAN FIRMS NOT SATISFYING THE 'CONSISTENCY CRITERION'

Year	Percentage of inconsistent firms
1998	44.1%
1999	42.5%
2000	42.9%
2001	36.8%

Finally, although there are no publicly available data, it is commonly believed that the number of audits on the values of the relevant independent variables was disproportionately low until the 2004 revision (Santoro, 2006). Therefore, there is a possibility that many firm had manipulated the threshold by reporting false values on the $\hat{x}_i$ (especially for variables different from costs).

In sum, three lessons can be drawn from the Italian experience. The first is that, as predicted by the theory, the choice to set a threshold on turnover instead of income is inefficient as this acts as an incentive to manipulate costs. The second is that the exogenous variables used to calculate the threshold should be easily verifiable by the tax authorities to prevent untruthful reporting by the firms. The third is that the endogenous determination of the parameters will work only if the first two problems have been solved. In any case it seems advisable to rely (at least partially) on exogenous information on firms' profitability.

VI. CONCLUSION

Tax enforcement for SMEs is always problematic, especially because they usually operate on the border between the formal and the shadow economy. Many countries

rely on special tax regimes that try to balance several (partly conflicting) objectives: the reduction of compliance costs, the provision of incentives to operate in the formal economy, the reduction of tax evasion, the growth in tax revenues. Besides very simple methods, based on lump-sum payments or turnover taxes, the literature has discussed two alternative approaches: a sophisticated audit rule, the Israeli *tachshiv* and a contractual presumptive method, the French *forfait*. This paper has described a third alternative, the Italian *Studi di settore*, which was implemented in Italy in 1998 and covers 70% of Italian firms. We argue that the *Sds* may be a valuable policy tool for developing countries, which, in common with Italy, have a large shadow economy and a high share of microenterprises. The *Sds* may be introduced as presumptive tax, when the resources available for audits are scarce; later it can be gradually be transformed into an auditing rule.

An obvious objection that could be raised against *Sds* is that it is a rather complex mechanism - both for the tax administration and for small firms. However, this potential drawback can be minimized to a reasonable level. Compliance costs will be greatly reduced if presumptive turnover (or income) is estimated on the basis of readily available information (such as geographic location, business sector, amounts of some inputs used in production). Tax administration becomes extremely simplified when *Sds* is used mainly as a presumptive tax. In this case the problem would be to set up the procedure for estimating the relevant parameters. To this end the suggestion made by Thuronyi (2004) for exporting the *tachshiv* in developing countries would perhaps be valuable: a consortium of countries could get together with international donors to set up *Sds* in a representative country and use the methodology and results (with minor adjustments) to implement *Sds* in other economies.

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