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Do Small Businesses Respond to a Change in Tax Audit Rules? Evidence from Italy.

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Abstract

Tax evasion by small businesses can be tackled using different approaches. A traditional one would recommend to increase the probability of an audit which is perceived by small businesses. Clearly, this entails high administrative and compliance costs. Another possibility is to reduce the room for accounting manipulation by adopting more stringent accounting standards for small businesses. This, however, is likely to generate even higher compliance costs for small businesses. Although these two policies are not mutually exclusive, an obvious way to implement the second one is to introduce more stringent accounting standard in exchange for a reduced probability to be audited. This is exactly the policy that we study in this paper, along with its repeal. This paper uses a panel of administrative data concerning 71,000 Italian small businesses observed in tax years 2005-2008. The aim of the paper is to evaluate the impact of a reform of audit rules implemented in 2006. Until 2005, small businesses adopting more stringent accounting standards were granted a special audit regime such that the probability to be audited was particularly low. This special regime was repealed in 2006. It is shown that the reform increased profits and turnover as reported by the subset of businesses which were more likely to perceive the reform as an increase in the probability of an audit.

JEL CLASSIFICATION: H25,H26, H32

KEYWORDS: Tax Evasion by Small Businesses, Accounting Standards

1

1 Introduction

During the last 40 years the Allingham and Sandmo (AS) model has been criticized for being unable to explain observed compliance levels which are much higher, at least in developed countries, than they should be according to the model. However, these criticisms have overlooked the fact that in practical applications it is important to distinguish between different types of income that are subject to quite different probabilities of audit [12]. In particular, while wage incomes are reported by the employer, other incomes are self-reported. In this paper we focus on business income, which is mostly self-reported within all tax systems.

A widespread belief is that evasion by large and publicly-traded multinational firms is the core of the problem of business tax evasion. As a matter of fact, the complexity of operations conducted by large firms creates a number of opportunities to reduce reported incomes [15]. However, tax evasion is a costly activity for a large firm. First, when a firm is large and complex using accurate business records is extremely valuable for productivity. Second, the manipulation of these records is a risky choice, since the probability of being detected increases in the number of employees who are involved in this manipulation activity (see [9]). Third, in large and publicly-traded firms there are divergent reporting incentives for tax and financial accounting purposes, since reducing reported incomes also reduces income which can be distributed to shareholders [6].

Reversing these arguments, evasion can be relatively simpler for small businesses, where unaccurate accounting is less costly and less risky. Moreover, privately-held small businesses have fewer capital market pressures and thus can sacrifice reporting high financial accounting earnings and take more aggressive tax positions [7]. For these reasons, it can be conjectured that evasion is very high (also) among small businesses, in accordance with the U-shaped hypothesis on the relationship between evasion propensity and size (see [15]). Note that the high propensity to evade by small businesses is a particularly troublesome issue for the European Union, where 92% of enterprises are small ones, i.e. they hire between 0 and 9 employees. Although no statistically significant analysis can be performed due to the lack of more disaggregated data, it is interesting to note that among countries with the highest share of small businesses there are Greece, Italy, Slovakia and Poland which are also among EU countries with the highest VAT gap.

Following this line of reasoning, evasion by small businesses can be tackled

2

using different approaches. A traditional one would recommend to increase the probability of an audit which is perceived by small businesses. Clearly, this entails high administrative and compliance costs. Another possibility is to reduce the room for accounting manipulation by adopting more stringent accounting standards for small businesses. This, however, is likely to generate even higher compliance costs. Although these two policies are not mutually exclusive, an obvious way to implement the second one is to introduce more stringent accounting standard in exchange for a reduced probability to be audited. This is exactly the policy that we study in this paper, along with its repeal.

Here, we consider Italy[1] which has the fifth highest VAT gap (see [2]) and the sixth highest proportion of small enterprises within EU-26 (see the Eurostat Structural Business Statistics Database). We examine the impact of a policy reform enacted in 2006. Before 2006, small businesses adopting stringent accounting standards were granted a special audit regime , since, in practice, they could not be audited according to a method known as BSS (Business Sector Studies). This method is based on a presumptive turnover, so that if the business does not provide justifications for the (positive) difference between presumptive and reported turnover, this difference is treated as presumptively unreported income. After the reform, this special regime was repealed, so that any small business could be audited according to BSS regardless of its accounting standard. As it is argued in the paper, this policy change could be perceived as an increase in the probability of an audit especially for small businesses which, before the reform, reported a turnover lower than the presumptive one.

The aim of the paper is to contribute to answer to two research questions. First, whether for small businesses an increase in audit probability can increase tax compliance. This question has recently been analyzed by looking at the impact of deterrence policies based on VAT paper trail [10] or on 3rd party-information [4] as well as at the specific deterrence effect of prior audits [5]. The second issue is whether more stringent accounting standards can lead to more tax compliance, an issue which is studied exclusively with reference to large firms (see [6]).

Note that, in the context of the paper, the two questions are strictly, and somewhat inversely, interrelated. In particular, if businesses which benefitted

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[1]This paper is part of a Research Project on Tax Compliance conducted in collaboration with the Italian Revenue Agency.

from the special audit regime, while adopting a more stringent accounting standard, did increase compliance after the special audit regime was repealed, then the answer to the first question is positive while that to the second is negative. Indeed, this is the main result of the paper. This implies, also, that using more stringent accounting standards as a substitute for audit probability is unlikely to be the best strategy to tackle tax evasion by small businesses.

The paper is organized as follows. Section 2 describes in detail the institutional background, i.e. accounting standards and audit rules applicable to small businesses in Italy. Section 3 formalizes these standards and rules and identifies the set of treated businesses and the subset of businesses for which the reform can more directly be interpreted as an increase in audit probability. Section 4 illustrates the dataset, while Sections 5 and 6 discuss the empirical approach and the obtained results. In the final Section, the contribution of the paper is analyzed in the context of the existing literature.

2 Institutional background

In this paper, we define as a small business a firm whose turnover, i.e. value of sales, does not exceed 5 millions of euros. A small business can take the legal form either of a company or of a single entrpreneur. In turn, a company can be a limited liability one (spa or srl) or an unlimited liability one.

Accounting standards and their application to small businesses are described below (see Table 1).

Table 1: Accounting standards and their application to small businesses

	Ordinary accounting (OA)	Simplified Accounting (SA)
Coverage	All operations	Some operations
Application to ltd companies	Mandatory	Forbidden
Application to others*	Mandatory over/Optional below threshold	Default below threshold
Private Costs	High	Low
Non-tax advantages	YES	NO
*=unltd. companies and single entrepreneurs		

While for limited liability companies OA is the only possible accounting standard, for other small businesses OA is mandatory only if, in the previous year, the business has reported a turnover (i.e a value of sales) which is higher

4

than a given threshold, varying across sectors and time.[2]

If turnover is below this threshold, SA is the default standard for these businesses. However, they can opt for OA, and, when this option has been chosen, it remains valid until it is revoked (explicitly or implicitly) by the business.

From the business's viewpoint, OA is usually more costly when accounting is outsourced, as it usually happens among small businesses, but it offers some non-tax advantages. In particular, OA provides useful information to monitor firm's performance and to perform internal auditing. From the Revenue Agency's viewpoint, OA may be useful to reduce the room for accounting manipulation and also to increase the efficiency of a tax audit.

Audit rules are based on *Business sector studies*, BSS, which were introduced in 1998 (see [13] and [14]). Businesses reporting a turnover (value of sales), $\widehat{R}_i$, not higher than 5 millions of euros have to compare this reported value with a presumptive turnover defined as

$$PT_{ij} = \beta_j \widehat{x}_{ij} \tag{1}$$

where j is the business sector to which the business belongs, β_j is a vector of productivity parameters defined by the Revenue Agency and $\widehat{x}_{ij}$ is a vector of input values as reported by business i belonging to sector j. If a business reports a turnover which is not lower than the presumptive one is defined as a congruous business (C). Otherwise, if $\widehat{R}_i < PT_{ij}$ the business is defined as non-congruous (NC) in that tax year. Note that the vector of productivity parameters, and thus the value of presumptive turnover for tax year t, is known to the business during year t+1, few months before tax reports for year t are due but after its end (see also Table 4).

Until 2006, the risk to be audited for small businesses was based on the congruity status and also on the accounting standard. We distinguish three cases (see Table 2):

- Non-congruous businesses using SA (NCSAs) can be audited on BSS-bases; this implies that, if they do not provide justifications for the difference between presumptive and reported turnover, this difference

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[2]For tax years considered in this paper, the threshold was equal to 310,000 euros for businesses operating in the service sector and to 516,000 euros for other businesses (essentially, those operating in agriculture, manufacturing and construction sector). More recently, these thresholds were increased to 400,000 and 700,000 euros, respectively.

5

is treated as presumptively unreported income. In turn, this implies that the burden of proof is shifted onto the business, which has to provide evidence that it has fully complied with its tax obligations despite being non-congruous.

- Non-congrous businesses using OA (NCOAs) could not be audited on BSS-bases unless prior proof of 'unreliability' of their accounting books was provided. The proof of 'unreliability' of accounting books is generally considered as very difficult and costly to provide thus we say that a *special audit regime* was granted to NCOAs.

- Congruous businesses, regardless of the accounting standard, cannot be audited on BSS-bases.

Table 2: Accounting standards and audit rules before 2006 reform

	OA	SA
NC	special audit regime	BSS audit allowed
C	BSS audit not allowed	

In July 2006 the newly elected Parliament passes decree n.223-2006, also known as Visco-Bersani after the name of proposing ministers. The 2006 reform introduces two major changes to BSS: normality analysis, which applies to all businesses, and the repeal of the *special audit regime* for businesses adopting OA. This repeal is enacted as from BSS to be published by March 2007, applicable to tax year 2006. [3] Thus any business can be audited on the basis of BSS if it is non-congruous, i.e. if it reports $\widehat{R}_i < PT_{ij}$ (see Table 3).

To evaluate the impact of this change, we need to consider carefully the timing of administrative deadlines and of businesses'choices (see Table 4).

At the end of February 2006 the business chooses its accounting standard for tax year 2006. At that time, it does not know that the special audit

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[3] The presumptive turnover is calculated as $PT_{ij} = \max(\beta_j \overline{x}_{ij}; \beta_j \widehat{x}_{ji})$ where $\overline{x}_{ij}$ is

a *normal* value of inputs calculated by the Revenue Agency to limit the possibility of the business to understate presumptive turnover by underreporting input values and/or overreporting costs. Note that, in 2006, this applies to all businesses belonging to our sample. Moreover, for these businesses, it remains unchanged in years 2007 and 2008.

6

Table 3: Accounting standards and audit rules after 2006 reform

	OA or SA
NC	BSS audit allowed
C	BSS audit not allowed

Table 4: Time framework and administrative deadlines : the 2006 reform

Date	Content
1st of January 2006	Beginning of tax year 2006
By End of February 2006	Choice of OA/SA for tax year t*
July 2006	Reform: repeal of the special audit regime as from tax year 2006
31st of December 2006	End of tax year 2006
31st March 2007	Publication of presumptive turnover for tax year 2006
2nd of May- 30thSeptember year 2006	Tax report for tax year 2006
*conditional upon legal form, sector and turnover of year t-1	

repealed is about to be repealed only few months afterwards, in July 2006. Therefore the reform is approved before the end of the tax year, but after the choice of the accounting standard has been taken. This is important since it ensures that the reform is exogenous with respect to the choice of the accounting standard for tax year 2006, given the turnover value [4]. Thus, in principle, it is possible to evaluate the impact of the reform by measuring the change in compliance in tax year 2006 with respect to tax year 2005. [5]. Clearly, this reasoning assumes that the reform was not anticipated by taxpayers.

The exogeneity assumption does not strictly hold for tax years 2007 and

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[4]To appreciate this, consider the opposite case, i.e that, when making the choice of the accounting standard for tax year 2006, the business knew that the special audit regime had been repealed. Then, to the extent that the choice of the accounting regime actually changes the opportunities for tax evasion, the tax reports for tax year 2006 could be influenced by this choice. For example, some businesses (unincorporated firms or single entrepreneurs reporting a turnover below the thresholds) could switch back to SA and, by doing this, have the opportunity to evade more (or less).

[5]Note also that, although tax years usually end at 31st of December, so that tax year 2005 was ended when the reform was announced, some tax reports for tax year 2005 could still be issued. This implies that, to the extent that book-tax divergences are feasible, data for tax year 2005 could be affected for businesses issuing their tax reports in the period between July and September 2006. However, if one assumes that OA limits book-tax divergences this possibility should not affect the interpretation of empirical results.

7

2008 [6], since the choice of the accounting standard for these years is made after the policy change. This calls attention to the trends observed in the choice of the accounting standard for these tax years.

3   Theoretical considerations

In the original AS model the taxpayer is assumed to know the fixed probability to be audited. Models have been developed to show that, when the Revenue Agency is budget-constrained, the optimal audit probability should be endogeneous, and, in particular, that it should depend on the amount of income reported [1]. Within BSS rules, models can be constructed to derive an income-conditional audit probability along with rational responses by the taxpayer (see [13] and [14]). However, these models are implicitly based on the assumption of full information. In reality, the exact audit probability is *not* fully revealed to taxpayers. who only know whether a BSS-based audit is possible or not.

Define q_{it} as a binary variable which takes on the value of 1 when BSS-based audit is allowed and 0 when it is not allowed or when the special audit regime applies. Rather than an exact probability level, q_{it} should be regarded as an indicator of the possibility of a BSS-based audit. Then we can write

$$q_{it} = q_{rt}(AS_{it}, CS_{it}) \tag{2}$$

where r_t is the audit rule applicable in tax year t -pre or post 2006 reform-,

AS_{it} is the accounting standard -either ordinary (OA) or simplified (SA)- and CS_{it} is the congruity status, either congruous (C) or non congruous (NC). According to audit rules explained in Section 2 we have

$$q_{r06}(., C_{i06}) = q_{r05}(., C_{i05}) = 0; q_{r06}(SA_{i06}, NC_{i06}) = q_{r05}(SA_{i05}, NC_{i05}) = 1 \tag{3}$$

while

$$q_{r06}(OA_{i06}, NC_{i06}) = 1; q_{r05}(OA_{i05}, NC_{i05}) = 0. \tag{4}$$

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[6]All deadlines reported in Table 4

8

As we shall see, no change of accounting standard is observed in our dataset between tax years 2005 and 2006, and few are observed in 2007 and 2008. Thus, it is convenient to express the impact of the reform on q_{it} as

$$\Delta q = q_{r06}(CS_{i06}) - q_{r05}(CS_{i05}) \tag{5}$$

taking the accounting standard as given.

In sum, the reform can be interpreted as an exogenous treatment on businesses adopting OA in 2006 (and in 2005), i.e. with $AS_i = OA$ while businesses adopting SA in 2006 (and in 2005), i.e. those with $AS_i = SA$, are untouched by the reform. Thus, as equation (5) indicates, the impact of the reform depends exclusively on the congruity status before and after the reform, i.e. in tax years 2005 and 2006 (or following ones) respectively.

Now consider that, when the reform is implemented, the congruity status for tax year 2005 is known, while that for 2006 is not. Thus, it seems reasonable to assume that the *perceived* impact of the reform is to be evaluated conditionally on the pre-reform congruity status. This implies that the set of treated businesses is to be divided into two subsets:

1. businesses which adopted OA and were non-congrous in tax year 2005 (NCOA05s)will face *an increase* in audit probability, $\Delta q = 1$, provided their congruity status does not change;

2. businesses which adopted OA and were congrous in tax year 2005 (COA05s) will *not* face an increase in audit probability, $\Delta q = 0$, provided their congruity status does not change.

Thus, the reform may be perceived as an increase in audit probability, i.e. in the possibility of a BSS-based audit, by NCOA05s, but not by COA05s. An alternative way to express this idea is that the repeal of the special audit regime should be less relevant for businesses which previously did not make use of it. Following this line of reasoning,the reform may increase compliance by NCOA05s, while the impact on COA05s is more dubious.

In turn, this increase in compliance can be measured by a higher reported value of turnover and/or of profits.

If presumptive turnover was fully known to the taxpayer at the time when the reform is enacted, then, to offset the repeal of the special audit regime, the non-congruous small business could report a turnover which is high enough to reach the congruity status. However, the reform is enacted in

9

July 2006, while, for tax year 2006, the level of presumptive turnover is not known before March 2007 (see Table 4). Thus, the increase in compliance can take the form of an increase in reported turnover, though to a level not necessarily related to the (unknown) presumptive turnover.

Since the possibility of an audit cannot be ruled out by an increase in reported turnover, the small business may react by increasing profits since, for all businesses, profits are the relevant tax base. If a BSS-based audit is triggered, increasing profits can enhance the business' ability to provide evidence that it has not evaded taxes, despite being non-congruous.

For tax years 2007 and 2008, the same reasoning applies except that the business knows that the special audit regime had been repealed. Thus, if it has the option to do so, it may react by 'switching back' to its default accounting standard, SA, whenever this is less costly than OA (for example, when accounting is outsourced). This would generate a confounding effect, since the difference between turnover or profits reported in 2007 (or 2008) and those reported in 2005 would be due to the reform but also to the change in the accounting standard. The magnitude of this problem can be revealed by analyzing the dataset.

4   Dataset and descriptive statistics

We observe a panel of 70,935 small businesses reporting data for tax years 2005-2008. This is a random sample drawn from the universe of 3,4 millions of small businesses for which presumptive income is calculated in tax year 2007. For them, we have information concerning their accounting standard, their presumptive turnover, their tax reports (profits and turnover) along with a number of individual features. Each of these businesses reports a turnover not exceeding 5 millions and thus are subject to BSS[7]. Although we do not have information on the ownership of these businesses, the tradition of Italian family capitalism suggests that only large firms are traded on stock markets. Thus we can assume the sample is made of privately-held businesses.

As to the accounting regime, there are approximately 14,450 businesses having the form of a limited liability company (spa's or srl's) for the entire

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[7]Note that, since tax year 2006 onwards, normality analysis applies in the same way to all of these businesses for the entire period observed. This is important to be noted since, in tax years 2007 and 2008, for some businesses *not* included in our sample, normality analysis was changed. See also footnote 2.

10

period, and thus legally obliged to adopt OA. Among the remaining 55,000 businesses, between 2006 and 2008 only 10% are legally obliged to choose OA because of their reported turnover, given the sector where they operates. This amounts at saying that, on average, there are approximately 20,000 businesses which are legally obliged to choose OA, while approximately 51,000 are free to choose between SA and OA[8].

Table 5: Accounting standards, number of businesses

	2006	2007	2008
SA	38,859	38,772	38,702
OA	32,076	32,163	32,233
of which by option	*11,492*	*11,122*	*11,002*
as % of total with option	*22.8%*	*22.3%*	*22.1%*
Total	70,935	70,935	70,935

The share of businesses which opt for OA declines after the reform from 22.8% to 22.1% i.e by 0.7 percentage points. This implies that endogeneity in the choice of accounting standards for tax years 2007 and 2008 is not a major issue, since businesses tend to maintain the accounting standard they have opted for. More in general, we note that only few firms change their accounting standard from OA to SA after the reform is passed, i.e. after 2006. The reason for this stickiness of behaviour could be that small businesses follow the suggestions of their tax consultants which have an interest in keeping the OA standard, since this entails a higher remuneration for them.

Tables 6 and 7 provide some descriptives for the most relevant variables in the observed years for SA and OA businesses, respectively.

It can be seen that the two subsets are quite different, since OAs are larger than SAs. This is a consequence two sources of heterogeneity. First, OA is mandatory for limited liability companies, that are intrinsically different from the rest of the sample. Second, OA is mandatory for small business whose turnover exceeds given thresholds. As a matter of fact, when we consider only businesses which, reporting a turnover below the threshold, have opted for OA for tax year 2006 the differences are greatly reduced, especially when profits are considered (see Table 8).

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[8]Data on the choice of accounting standard for tax year 2005 are not available.

Table 6: Descriptives for SAs

	Turnover*	Pres_turn*	Profits*	Surface**	# Workers	% NC
2005	69,8	67	17,5	107.9	.45	32.3%
2006	75,7	77,7	19,6	110.8	.46	50.2%
2007	79,1	80,6	20,5	111.4	.49	46.5%
2008	79,7	81,5	20,0	115.1	.49	49.5%
*=average values, thousands of euros						
**=average values, squared meters						

Table 7: Descriptives for OAs

	Turnover*	Pres_turn*	Profits*	Surface**	# Workers	% NC
2005	570,8	545,5	37,6	597.9	3.1	26.4%
2006	614,5	615,8	45,	630.0	3.1	42.3%
2007	633,7	637,9	44,2	641.6	3.6	43.6%
2008	624,9	621,2	42,1	647.3	3.2	41.8%
*=average values, thousands of euros						
**=average values, squared meters						

Table 8: Descriptives for OAs by option in 2006

	Turnover*	Pres_turn*	Profits*	Surface**	# Workers	% NC
2005	164,7	157,9	25,8	263.2	1.2	29.7%
2006	189,4	191,7	31,3	267.1	1.3	44.8 %
2007	198,4	200,0	31,9	268.4	1.3	44,1 %
2008	195,4	196,1	30,8	276.4	1.3	44,8%
*=average values, thousands of euros						
**=average values, squared meters						

12

5   Empirical approach

Since the reform we are considering here is exogenous with respect to the choice of the accounting standard for 2006 we can use a DiD (difference in differences) approach to estimate its impact. In principle, the treated population is made of businesses which adopted OA for 2006, while the untreated one is made of businesses which adopted SA for 2006.

However, we have to deal with two major limitations in our dataset.

The first is that only one year of pre-reform data is available, so that we cannot properly test the parallel trend assumption for relevant variables, i.e. profits and turnover [9]. This is a concern because the choice of the accounting standard before the reform was most likely nonrandom, and this self selection could affect the estimated effects. In particular, businesses which adopt OA in 2006 could have some non-observable time-variant characteristics correlated with outcomes. Thus, treated businesses could be structurally different from untreated ones and, consequently, the DiD analysis may capture not only the impact of treatment but also that of these non-observables, whose sign is a priori unknown. In sum, DiD analysis on its own is not sufficient to establish a causal relationship between the reform and compliance.

Moreover when we observe Tables 6 and 7 we see that differences between treated and untreated businesses in observables are quite large.

To address these issues we do two things.

First, we restrict our analysis to treated businesses which opted for OA in 2006 since, as noted in previous Section they are more similar to non-treated businesses, i.e. those adopting SA for 2006. This comparison is particularly interesting since, while the business which did not have a chance to opt for SA may have just *seized* the opportunity to evade offered by the special audit regime, the business which opted for OA,although its natural accounting regime was SA, could have done it to *create* such an opportunity.

Note, however, that this choice somehow exacerbates the self-selection problem. To deal with the latter we run some placebo regressions. The idea behind these regressions is the following. Suppose results of the DiD analysis comparing treated and untreated reports after the reform (i.e. for tax years 2006, 2007 and 2008) with those before (i.e for tax year 2005)

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[9]We can test the parallel trend assumption for inventories, since the value reported in 2005 corresponds to the end of 2004. However, as suggested by an anonymous referee, inventories are not a relevant variable in our context.

13

are due not only to the change in policy, but also to some non-observable time-variant characteristics of the treated business. In such a case, when comparing reports after the reform (i.e 2007 versus 2006 or 2008 versus 2007) we should find that the coefficient of interest of the placebo DiD analysis is significant. On the contrary, if the coefficient of interest in these placebo regressions is not significant we can be more confident in the results of our genuine DiD analysis.

The DiD model is written as follows

$$x_{it} = \alpha + \beta Y06 + \gamma OA06 + \delta OA06\#Y06 + CONTROLS \qquad (6)$$

where x_{it} is the outcome variable for business i at year t, $Y06 = 1$ if tax year is 2006, $OA06 = 1$ if the business opts for OA in 2006, $OA06 = 0$ if it did not and $OA06\#Y06$ is the interaction term.

The model is initially estimated taking year 2005 as the base year and year 2006 as the outcome year and clusterizing standard errors at the sectorial level.

We use three types of controls (see Table 9). First, we include the level of presumptive turnover and surface (along with its squared value) to adjust for the size effect noted before. The inclusion of presumptive turnover also ensures that the DiD is estimated controlling for the heterogeneity in responsiveness to BSS. Second, we include variables such as the region of operation and the legal type of business since they are believed to be relevant to describe propensity to evade in Italy (see [3]). Finally, we clusterize errors at the sectorial level to take into account possible heterogenities in the calculation of presumptive turnover.

Table 9: Controls

Variable	Description
presturn	see equation (1)
areageocod	1=North West; 2=North East; 3=Center; 4= South; 5=Islands
surface	squared metres of shops, offices and warehouses
type	0=non commercial; 1=single entrepreneur; 2=unincorporated; 3=lmtd. liab
sdsnum	BSS code

We then run, separately for the two subsamples (congruous and non-congruous in 2005), two placebo regressions:

14

- a DiD regression where we evaluate a placebo reform conducted in 2007, against 2006 as the fictitious base year (coefficient on *plactreat*07 is the relevant one);

- a DiD regression where we evaluate a placebo reform conducted in 2008, against 2007 as the fictitious base year (coefficient on *plactreat*08 is the relevant one)

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As argued before, we expect both these coefficients to be non-significant. This would mean that the reform has generated a jump when it has been introduced and that, afterwards, tax reports have been influenced by the economic cycle and by other individual features that we can observe. In such a case, it is useful to estimate equation (6) using 2007 and 2008 as outcome years to see whether the impact of the reform is still significant.

6 Main Results

Before presenting the regression results, we introduce them by using graphical analysis. Profits reported by treated businesses, i.e. those opting for OA in 2006, increase sharply with respect to 2005, while they are approximately constant between 2007 and 2006 and declining between 2008 and 2007. The increase shown by non-treated businesses, i.e. those not opting for OA in 2006, is smaller with respect to 2005, while for the following years the pattern is more similar to that concerning treated businesses (see Figure 1).
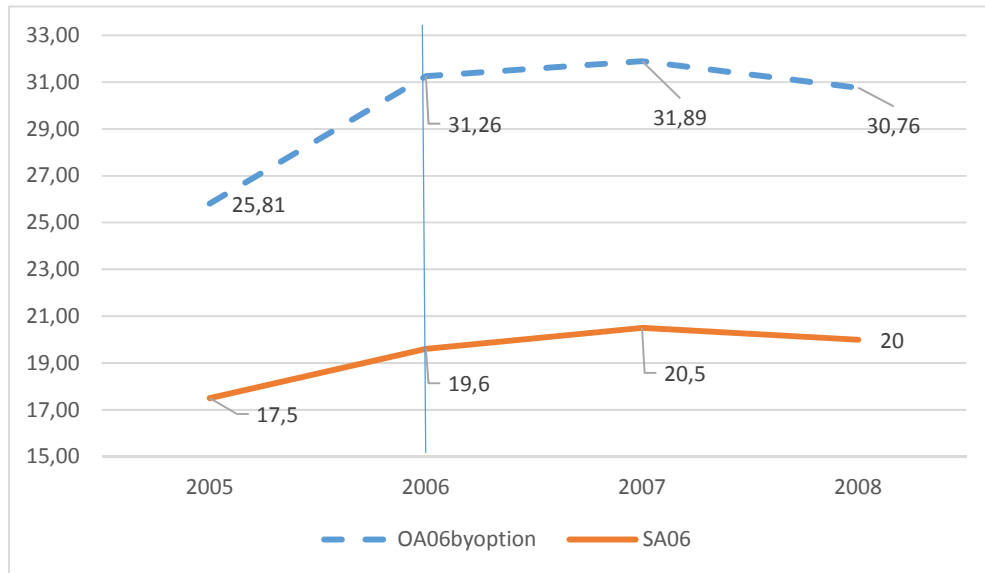
15

Figure 1: Comparison of profits (in thousands of euros)

Similar considerations arise when we compare turnover (see Figure 2 where absolute values have been scaled down by 90%), which increases steadily for businesses opting for OA in 2006 while it varies relatively less for untreated businesses.
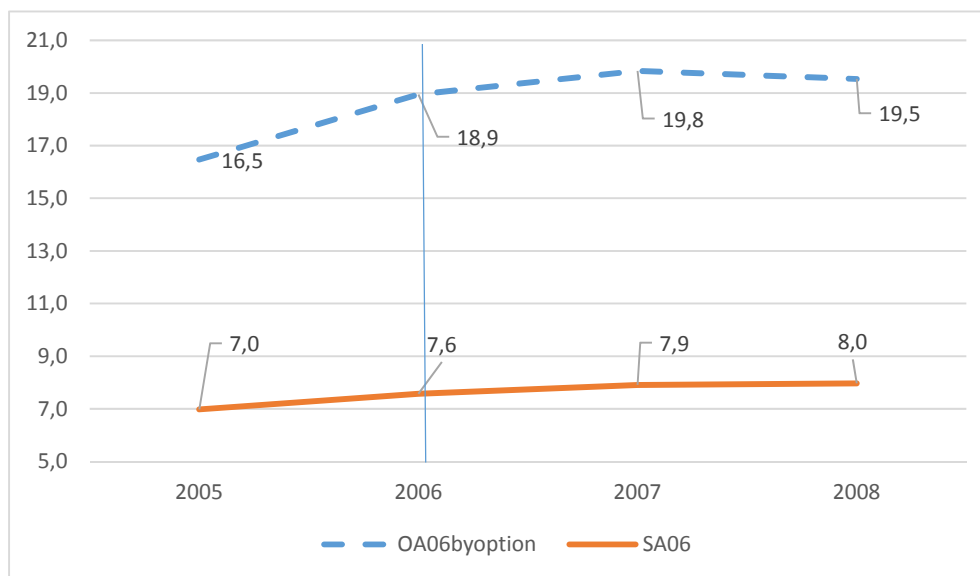
16

Figure 2: Comparison of 10 % of turnover (in thousands of euros)

However, we need to analyze these differences in differences by taking into account the congruity status along with the individual characteristics of single businesses.

We first run (6) taking profits, expressed in thousands of euros, as the dependent variable. This variable should respond to variations in perceived audit probability and it should also provide indications on the impact of the reform on government revenues, since, for all businesses, taxes are paid on profits.

17

Table 10: DiD, 2006 vs 2005 dpt. var.: profits (in thousands of euros)

VARIABLES	(1) NC05 (1)	(2) NC05 (2)	(3) C05 (1)	(4) C05 (2)
OA06	-0.664	-0.260	2.790	4.565**
	(0.961)	(1.007)	(1.743)	(1.927)
Y06	2.066***	2.059***	1.361***	1.333***
	(0.232)	(0.233)	(0.395)	(0.387)
OA06#Y06	2.520***	2.473***	1.401	1.135
	(0.501)	(0.516)	(0.919)	(0.999)
CONTROLS	YES	NO	YES	NO
Constant	6.546**	10.19***	2.948	15.92***
	(3.154)	(1.123)	(5.348)	(1.772)
Observations	30,081	31,964	62,866	68,738
R^2	0.218	0.199	0.068	0.064
Mean of dpt.var	14.8	14.8	23.6	23.6

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results are overall in line with theoretical expectations. The coefficient of interest is positive and significant when NC05s are considered for all years and for all specifications. On the contrary, when the subset of C05s is selected, the coefficient of interest is non-significant. Moreover, for the subset of NC05s the magnitude of coefficient in 2006 is almost twice as large as that estimated when the subset of C05s is selected. The increase in profits is approximately equal to 2,500 euros, i.e.15 % of profits reported by NC05s for tax year 2005.

Even sharper differences emerge when we estimate (6) using turnover as the dependent variable. Again, the coefficient of interest is always positive and significant for the subset of non-congruous businesses in 2005, while it turns negative when we consider the subset of congruous businesses in 2005 (see Table 11) below. The latter could be interpreted as a sort of 'regret' effect: assuming that these businesses adopted the ordinary accounting standard also in 2005, they did not take advantage by the special audit regime

18

since they were congruous, so they reacted to the repeal of the special audit regime by significantly lowering turnover (but not profits).

Table 11: DiD, 2006 vs 2005, dpt. var.: turnover (in thousands of euros)

VARIABLES	(1) NC05 (1)	(2) NC05 (2)	(3) C05 (1)	(4) C05 (2)
OA06	-0.0554	-0.179	8.015***	9.087***
	(0.981)	(1.024)	(2.264)	(2.498)
Y06	1.112**	1.188**	-5.123***	-4.988***
	(0.499)	(0.507)	(0.454)	(0.501)
OA06#Y06	3.342***	3.293***	-2.260*	-2.694**
	(0.610)	(0.594)	(1.271)	(1.164)
CONTROLS	YES	NO	YES	NO
Constant	-6.224**	-1.397	4.681	10.01***
	(2.576)	(1.230)	(6.197)	(2.198)
Observations	30,081	31,964	62,866	68,738
R^2	0.964	0.963	0.952	0.951
Mean of dpt.var	86.5	86.5	101.2	101.2

Robust standard errors in parentheses

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

7 Placebo regressions

Results obtained in previous Section seem to indicate that there was a significant increase in profits and turnover as reported by treated businesses, i.e. those which opted for ordinary accounting to take advantage of the special audit regime but were subsequently hit by its repeal.

However, further robustness checks of these results are needed. As mentioned before, our primary robustness check are placebo regressions.

19

Table 12: Placebo regressions

VARIABLES	(1) NC05 07 vs 06 (1)	(2) NC05 07 vs 06 (2)	(3) NC05 08 vs 07 (1)	(4) NC05 08 vs 07 (2)
OA06	0.541	1.191	-0.696	3.172***
	(0.908)	(0.910)	(0.566)	(0.893)
placY07	0.892***	0.909***		
	(0.175)	(0.173)		
plactreat07	-0.108	-0.719		
	(0.488)	(0.816)		
placY08			-0.533	-0.350
			(0.533)	(0.536)
plactreat08			-0.109	0.131
			(0.931)	(1.001)
CONTROLS	YES	NO	YES	NO
Constant	7.604***	11.52***	5.755*	16.63***
	(2.735)	(0.874)	(3.040)	(0.481)
Observations	30,184	31,964	30,246	68,738
R^2	0.249	0.201	0.286	0.190

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results tend to confirm the robustness of our previous conclusions.

When we consider NCO5s, i.e. the subset of businesses for which we found significant results in testing the impact of the reform, all regressions and specifications yields non-significant coefficients, as expected. Thus, the reform generates a statistically significant discontinuity in profits reported for tax year 2006 only, i.e. the year following the introduction of the reform.

It is then interesting to verify whether the impact of the reform, which is seemingly generated in a single year, 2006, persists over a longer period. To do so, we estimate equation (6) using 2007 and 2008 as outcome years, and

20

2005 as base year.

Table 13: DiD, 2007-8 vs 2005 dpt. var.: profits (in thousands of euros)

VARIABLES	(1) NC05 07-05 (1)	(2) NC05 07-05 (2)	(3) NC05 08-05 (1)	(4) NC05 08-05 (2)
OA06	-2.519***	-2.110***	-1.808***	-1.436**
	(0.602)	(0.480)	(0.611)	(0.607)
Y07	2.832***	2.925***		
	(0.311)	(0.324)		
OA06#Y07	2.250***	1.808**		
	(0.621)	(0.743)		
Y08			-0.0147	-0.112
			(0.548)	(0.539)
OA06#Y08			1.791*	1.718*
			(0.986)	(0.993)
CONTROLS	YES	NO	YES	NO
Constant	3.634	8.339***	4.677	10.00***
	(2.537)	(0.505)	(3.356)	(0.469)
Observations	30,089	31,964	30,143	31,964
R^2	0.287	0.235	0.260	0.249
Mean of dpt.var	14.9	14.9	23.7	23.7

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The impact of the reform is still visible in 2007 and in 2008 but its magnitude is reduced to an increase of reported profits of approximately 2,000 euros in 2007 and 1,700 euros in 2008.

21

8   Concluding remarks

A recent literature has emphasized that increasing the perceived probability of an audit can enhance compliance of self-reported incomes, consistently with the prediction of the Allingham-Sandmo model (see [8]) for the self-reported part of total income reported by Danish dependent workers, and [10] for Chilean businesses subject to VAT). The present paper shows that a similar result holds when a reform of audit rules implemented in Italy and involving small businesses is considered. The reform has significantly increased profits reported by the subset of businesses for which it can more safely be interpreted as an increase in the perceived probability of an audit. The magnitude is quite large- an increase of approximately 15% of reported profits. Over all, these results suggest that an increase in audit probability may be a viable strategy in all countries where small businesses are among the least compliant taxpayers.

The evidence provided here should be taken with caution, as the causal link between the policy aiming at increasing the perceived probability to be audited and the increase in compliance is suggestive, not definitive. However, our results are in line with a recent literature (see [4], [10] and [5]) showing that small businesess do respond to policies aiming at increasing deterrence.

Finally, our results can be interpreted from a welfare point of view. We previously point out that audits generate administrative costs for the tax authority, and also compliance costs for audited taxpayers. In contrast, strict accounting standards only create compliance costs for taxpayers. Thus, one might be tempted to conclude that the adoption of these standards is welfare superior to the traditional audit policy. Our results suggest the opposite, since they seem to indicate that, on average, small businesses did evade more despite adopting such a standard. Clearly, this can be due to the standard itself being ill-defined, or non-credible. Since these alternative explanations cannot be tested, a message of this paper is to look with some caution at the possibility of substituting the traditional deterrence policies with some legally-defined accounting standards for privately-held businesses.

However, note that even if a more stringent accounting standard does not reduce the share of income which is evaded it may increase the audit effectiveness, i.e. it may increase the share of evaded income which is discovered during an ordinary audit. This is, indeed, the view expressed by the Italian Revenue Agency. On the other hand, the small share of businesses that "switch back" to the simplified accounting standard after the repeal of

22

the special audit regime indicates that there might be some private non-tax advantages arising from ordinary accounting. One can speculate, for example, that a small business can voluntarily adopt a more stringent accounting standard since this allows a more complete monitoring of its activities. Thus, the results can be interpreted as suggesting that the adoption of more stringent accounting standards should not be supported by tax incentives, but rather should be left as an opportunity for small businesses which can profit from them.

Finally, the present paper is related to the literature on audit rules. Although in the original AS model random audits were assumed, the practice of modern Revenue Agencies usually adopt non-random audits [1]. Models have been developed to derive optimal audit rules and, in particular, it has been found that, when the Revenue Agency can make a credible committment to stick to an announced audit rule but it is budget-constrained then it is optimal to divide taxpayers in groups, so that those reporting an income higher than a given threshold will not be audited and will thus enjoy an audit exemption [11]. Thresholds are probably used by many Revenue Agencies, in different forms (for example, in the form of the DIF score in the US) but they are rarely disclosed to the taxpayer. Our paper shows that, when the existence of an audit rule is publicly announced, taxpayers do respond rationally by seizing the opportunities to evade that the rule creates.

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24

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25