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Do Small Businesses Respond to an Increase in the Probability of a Tax Audit? Evidence from a Policy Reform in Italy

Alessandro Santoro

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Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa
Università degli Studi di Milano - Bicocca
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Do Small Businesses Respond to an Increase in the Probability of a Tax Audit? Evidence from a Policy Reform in Italy

Alessandro Santoro, DEMS, University of Milan-Bicocca

Abstract

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. The reform repealed a special audit exemption previously granted to businesses which adopted a stringent accounting standard. It is shown that the reform increased the level of economic activity, as measured by the value of inventory, for the generality of businesses involved. However, an increase in profits and turnover was reported only by the subset of businesses which were more likely to perceive it as an increase in the probability of an audit. This result is in line with the predictions of the Allingham-Sandmo model and it casts some doubts on the possibility to reduce evasion by limiting the opportunities of manipulating accounting books.

JEL CLASSIFICATION: H25,H26, H32

KEYWORDS: Tax Evasion by Small Businesses, Audit Probability, Accounting Standard

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 [1]. 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.

Business income (profits) can be generated through a variety of organizational schemes, such as single entrepreneurs; small, domestic and privately-held firms; large and publicly-traded multinational firms. Ways to underreport business income are very different, too. The complexity of operations conducted by large firms creates a number of opportunities to reduce reported incomes [8]. On the other hand, 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 [11]. On the contrary, within smaller businesses formal records of financial transactions are not well maintained, especially when the business is privately-held. Privately-held small businesses have fewer capital market pressures and thus can sacrifice reporting high financial accounting earnings and take more aggressive tax positions [9]. This suggests that policies reducing the room for accounting manipulation may be a substitute for capital market pressures to decrease tax evasion by small businesses.

Here, we consider Italy[1] i.e. one of the OECD countries having, at the same time, the second-highest share of underground economy [10] and a high number of small businesses. A small business can take the legal form of a limited liability company (i.e. a small corporation) of an unlimited company or of a single entrepreneur. We examine the impact of a policy reform enacted in 2006. Before 2006, small businesses adopting stringent accounting standards were granted an audit exemption, since, in practice, they could not be audited according to a method known as BSS (Business

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

Sector Studies). After the reform, this exemption was repealed and the probability of an audit was increased for some businesses.

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. Second, whether more stringent accounting standards can be a substitute for capital market pressure and thus lead to more tax compliance. The two questions are strictly, and somewhat inversely, interrelated. In particular, if businesses entitled to the audit exemption in exchange for the adoption of more stringent accounting standard did increase compliance after the audit exemption 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.

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 Background and institutional details

According to the Italian law, ordinary accounting (OA) is the mandatory accounting standard in two cases:

1. when the business has the legal form of a limited liability company (srl or spa);

2. when the business has the legal form of an unlimited liability company or of a single entrepreneur but, in the previous year, has reported a turnover (i.e a value of sales) which is higher than a given threshold. This threshold, in turn, varies across sectors and time. 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.

Accounting books required within OA cover the whole set of operations accomplished by the business during the tax year, such as sales and purchases, financial operations, depreciation, investment and inventory evaluation. They include the General Journal, the Inventory book and other Ledgers provided for by the VAT and direct tax law. When the business has the legal form of an unlimited liability company or it is a single entrepreneur and, in previous year, it has reported a turnover which is lower than the threshold, the default accounting standard is the simplified accounting standard (SA) which requires only the registration of some operations and the maintenance of the General Journal and of the Inventory Book. However, a business whose (previous year's) turnover is below the threshold can opt for the ordinary accounting regime, and, when this option has been chosen, it remains valid until it is (implicitly or explicitly) revoked 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 [2] and [3]). Businesses reporting an yearly turnover (value of sales), $\widehat{R}_i$, not higher than 7,5 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 3).

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 1):

- 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 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 an *audit exemption* was granted to NCOAs.
- Congruous businesses, regardless of the accounting standard, cannot be audited on BSS-bases.

Table 1: Accounting standards and audit rules before 2006 reform

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

2.1 The 2006 reform of audit rules

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 audit exemption for businesses adopting OA. [2] 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 2).

[2]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.

Table 2: Accounting standards and audit rules after 2006 reform

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

To evaluate the impact of this change, we need to consider carefully the timing of administrative deadlines and of businesses'choices (see Table 3).

Table 3: Time framework and administrative deadlines

Date	Content
1st of January year t	Beginning of tax year t
By End of February year t	Choice of OA/SA for tax year t*
31st of December year t	End of tax year t
By End of March year t+1	Publication of presumptive turnover for tax year t
1st of June- 30thSeptember year t+1	Tax report for tax year t
*conditional upon legal form, sector and turnover of year t-1	

At the end of February 2005, when issuing its Annual VAT declaration for tax year 2004, the business chooses its accounting standard for tax year 2005. As explained before this is an unconstrained choice only for businesses not having the legal form of a limited liability company and reporting, for tax year 2004, a turnover below some specified thresholds. Similarly, 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 audit exemption is about to be repealed only few months afterwards, in July 2006. This is important since it ensures that the reform is exogenous with respect to the choice of the accounting standard for tax year 2006 [3].

Since when the reform is enacted the tax year is not ended but the choice of the accounting standard cannot be modified, in principle it is possible to evaluate the impact of the reform by measuring the change in compliance in

[3]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 audit exemption 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).

2006 with respect to 2005 [4]. Clearly, this reasoning assumes that the reform was not anticipated by taxpayers.

The exogeneity assumption does not strictly hold for tax years 2007 and 2008, 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 [4]. Within BSS rules, models can be constructed to derive an income-conditional audit probability along with rational responses by the taxpayer (see [2] and [3]). 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 audit exemption 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

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

[4]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.

while

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

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 audit exemption 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 audit exemption, the

non-congruous small business could report a turnover which is high enough to reach the congruity status. However, the reform is enacted in July 2006, while, for tax year 2006, the level of presumptive turnover is not known before March 2007 (see Table 3). 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 audit exemption has 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 an yearly turnover not exceeding 7,5 millions and thus are subject to BSS[5]. 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

[5]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.

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 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.

Table 4: Accounting standards

	2005	2006	2007	2008
SA	38,859	38,859	38,772	38,702
OA	32,076	32,076	32,163	32,233
of which by option	*na*	*11,492*	*11,122*	*11,002*
as % of total with option	*na*	*22.8%*	*22.3%*	*22.1%*
Total	70,935	70,935	70,935	70,935
Data on option not available for 2005 since 2004 turnover is not observable				

The share of businesses which opt for OA declines after the reform from 22.8% to 22.1% i.e by 1.7 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.

Tables 5 and 6 provide some descriptives for the most relevant variables in the observed years for OA and SA businesses, respectively.

Table 5: Descriptives for OA-businesses (average values)

	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,	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%

Three points are worth noting.

Table 6: Descriptives for SA-businesses (average values)

	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%

First, all values are larger for OAs which suggests to control for size when regressing profits or turnover to avoid spurious results and to check for functional form dependence in regressions results.

Second, there are some time trends. In 2006, we observe an increase in presumptive turnover, *pres_turn*, and in the share of non-congruous businesses, $\%NC$, for both accounting types. This depends probably on the normality analysis which is applied in a uniform way. In 2008, we observe that while turnover and profits clearly decline for OAs, they decline less or even increase for SAs. Since 2008 is the first year of the financial crisis, this may indicate heterogeneous effects of the crisis (i.e. stronger among OAs).

Third, in 2006 we observe an increase of 19.7% in average profits reported by OAs against an increase of 12% in average profits reported by SAs. This is a first indication of the impact of the reform.

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 business which adopted SA for 2006. The model is written as follows

$$x_{it} = \alpha + \beta Y06 + \gamma OA06 + \delta treat06 + CONTROLS \tag{6}$$

where x_{it} is the outcome variable for business i at year t, where $t = 2005, 2006$. $Y06 = 1$ if tax year is 2006 and $Y = 0$ if it is 2005, $OA06 = 1$ if the business is treated in 2006, i.e. if it adopts OA in 2006 $OA06 = 0$

otherwise, $treat06 = 1$ if the observation is from tax year 2006 and if the business adopts OA in 2006, and $treat06 = 0$ otherwise.

Consistently with Table 4, we verified that no business in our dataset changes accounting regime between 2005 and 2006. This implies that the coefficient of interest, δ, measures the DiD of the outcome variable between businesses which adopted (by legal obligation or by option) OA in *both* years against those which adopted SA in *both* years.

Since the repeal of the audit exemption could have different effects according to whether the audit exemption was used or not, we estimate DiD separately for the two subsets of businesses which were congruous in 2005, C05s, and those which were non-congruous in 2005, NC05s.

Table 7: 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 use three types of controls (see Table 7). First, we include the level of presumptive turnover and surface (along with its squared value) to adjust for 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 [5]). Finally, we control for business sectors or clusterize errors at the sectorial level to take into account possible heterogenities in the calculation of presumptive turnover.

The estimated value of δ can in principle be interpreted as a lower bound since treated businesses may change their behaviour only after July 2006, i.e. for the second mid of the tax year.

To have a more robust evaluation of the impact of the reform, we estimate equation (6) also for years 2007 and 2008 but keeping the same definition of treated business, that based on OA06, and year 2005 as the baseline. For example, we run the following regression

$$x_{it} = \alpha + \beta Y07 + \gamma OA06 + \delta treat07 + CONTROLS \qquad (7)$$

where x_{it} is the outcome variable for business i at year t, where $t = 2005, 2007$. $Y07 = 1$ if tax year is 2007 and $Y = 0$ if it is 2005, $OA06 = 1$ if the business is treated in 2006, i.e. if it adopts OA in 2006 $OA06 = 0$ otherwise, $treat07 = 1$ if the observation is from tax year 2007 and if the business adopts OA in 2006, and $treat07 = 0$ otherwise. The same holds for tax year 2008, and in such a case the relevant variable is $treat08$.

Recall that more than 99% of businesses adopting OA for tax year 2006 did the same for tax years 2007 and 2008 (see Table 4), so that by estimating 7 we can evaluate the impact of the reform on the businesses which were treated in 2006 with reference to their behaviour in years following the reform. The advantage of this formulation is that it can capture the modification of behaviour for an entire tax year. The limit lies in the possibility of more confounding effect, namely the economic crisis for tax year 2008.

The major issue we face is the choice of the outcome variable. Ideally, this variable should be i) observable for the pre-treatment period *and* ii) policy relevant. Unfortunately, our dataset does not contain such a variable. For our research questions, the relevant variables are profits and turnover, but we cannot observe them for the pre-treatment year, i.e. 2004. More precisely, our dataset contains only one variable which is observable for tax year 2004, the value of inventory. Indeed, in every tax year, the business has to indicate the initial and the final value of inventory, and the initial value reported for 2005 can be interpreted as the final value for 2004. By (initial or final) value of inventory we mean a variable which is constructed as the sum of three accounting variables: *the value of stored goods, the value of intermediate output and the value of intermediate services* each computed at the end of the year. Since it is a form of investment, the value of inventories can be viewed as a proxy for the level of economic activity reported by the business.

We shall run (6) for all of these three variables, with and without controls and for both subsets (C05s and NC05s) varying robustness checks and the interpretation of results according to the nature of data.

6 Results

6.1 Results on the value of inventory

For the value of inventory we can verify the parallel condition. First, we compare the percentage of variations of the value of inventory before and after the reform for treated (i.e. with $OA06 = 1$) and for nontreated businesses (see Table 8).

Table 8: Trends in the value of inventory

	OA06=1	OA06=0 (SA)	ΔOA	ΔSA
2004	165,34	15,80	na	na
2005	183,85	17,89	11,2%	13,3%
2006	198,09	18,92	7,7%	5,7%
2007	214,09	20,31	8,1%	7,4%
2008	220,88	20,57	3,2%	1,3%

The value of inventory increases between 2005 and 2004 by 11.2% among treated and by 13.3% among SAs (nontreated). However, after the reform, the value of inventory increases more among treated businesses than among non treated ones, and this holds for all of the three years following the reform. This suggests that the reform has changed the parallel trend which was present before the reform (see Figure 1 in the Appendix). To verify this, we run a regression of the relative variation of the value of inventory, *Dinventory*, on OA06 and a constant for a subset of businesses which report the value of inventory in a consistent way [6] (see Table 9).

The coefficient on the treatment variable is non-significant for the variation between 2005 and 2004 (before the reform) while it is positive and significant for the variation between 2006 and 2005 (after the reform). The relative variation in inventory is 12.6% higher among treated businesses.

The fact that the reform had an impact on the reported value of inventory is confirmed by the estimation of (6), with and without controls, when the value of inventory is taken as the outcome variable. The coefficient of interest is positive and significant in 2006, 2007 and 2008, as compared to 2005 (see Table 14 in the Appendix) and for both subsets (see Table 10 below, and Tables 15 and 16 in the Appendix).

[6] The value of inventory is reported unaccurately by approximately 7 % of businesses,

Table 9: Variation in the value of inventory

	(1)	(2)
	Dinventory 05-04	Dinventory 06-05
OA06	0.101	0.126**
	(1.43)	(2.67)
_cons	0.434***	0.321***
	(10.29)	(12.45)
N	64297	64297

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 10: DiD of value of inventory

	Non Congruous in 2005		Congruous in 2005	
	Model 1	Model 2	Model 1	Model 2
treat06	24.0***	25.7***	30.8***	21.3***
treat07	37.5***	38.7***	29.1***	19.0***
treat08	41.7***	53.0***	37.3***	37.3***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Model 1 with controls, Model 2 without controls

The coefficient is similar across the two subsets of businesses (NC05s and C05s) and it shows an increasing trend through years.

6.2 Results on profits and turnover

Next we run (6) taking profits as the outcome 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. We obtain results summarized in Table 11 below (see Tables 17 and 18 in the Appendix for details).

Table 11: DiD of profits

	Non Congruous in 2005		Congruous in 2005	
	Model 1	Model 2	Model 1	Model 2
treat06	6.792***	7.186***	3.736*	1.635
treat07	7.139***	6.472***	-1.060	2.198
treat08	4.643**	4.301***	-3.858*	-2.096

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Model 1 with controls, Model 2 without controls

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 positive and (slightly) significant only in year 2006, and only when all regressors are included. 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.

Even sharper differences emerge when we consider turnover as the relevant outcome 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 12 below and Tables 19 and 20 in the Appendix). The latter could be interpreted as a sort of 'regret' effect: businesses which adopted the ordinary accounting standard in 2005, but did not use the audit exemption since they

i.e. the initial value for year t is different from the final value for year t-1

were congruous, reacted to the repeal of the audit exemption by significantly lowering turnover (but not profits).

Table 12: DiD of turnover

	Non Congruous in 2005		Congruous in 2005	
	Model 1	Model 2	Model 1	Model 2
treat06	8.307***	10.15***	-30.54***	-33.74***
treat07	7.141***	8.588***	-34.08***	-37.00***
treat08	27.22***	24.94***	-32.75***	-32.7***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Model 1 with controls, Model 2 without controls

When the attention is limited to non-congruous businesses in 2005, the magnitude of the estimated DiD with respect to 2005 is roughly constant in 2006 and 2007, for both profits and turnover. Thus, it would not be justified to interpret the estimated DiD in 2006 as a lower bound for policy relevant variables, although it was originated only in the second mid of the year. Aside from endogeneity effects and excluding anticipation, one might conjecture that treated businesses set a maximum value of profits to report and do not go over that. This is consistent with the hypothesis of a 'reference point' in tax evasion decision that has already been advanced for the Italian case (see [13]).

In 2008, the coefficient of interest for NC05s remains positive, for both outcome variables and specifications, but its value changes in a rather obscure way: it decreases when profits are measured and it increases when turnover is the outcome. Heterogeneity in the impact of the economic crisis, starting off in the second mid of 2008, on profitability margins across treated and untreated businesses can be conjectured, but not tested.

We check the results on profits by:

- clusterizing errors at the sectorial level;
- allowing for a different functional form where numeric variables are expressed in logs.

When errors are clusterized at the sectorial level, i.e. using the same definition of business sector which is used within BSS, and the subset of NCO5s

is considered, the coefficient of interest when profits is the outcome variable is significant in 2006 and in 2007, for both the complete and the reduced model, although it is not significant in 2008 (see Table 21 in the Appendix). On the contrary, when the subset of CO5s is selected, the coefficient of interest is never significant(see Table 22 in the Appendix).

On the other hand, when profits are specified in log terms, results are qualitatively the same as obtained with regressions in levels (see Tables 23 and 24).

6.2.1 Placebo regressions

As noted above, we are not able to verify the parallel trend condition for profits. To test that results obtained above are due to a causal effect, we run two placebo regressions:

- 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)

Table 13: placebo DiD of profits

	Non Congruous in 2005		Congruous in 2005	
	Model 1	Model 2	Model 1	Model 2
plactreat07	-0.11	-0.30	-5.18*	-3.94
	-0.059	-0.16	-2.31	-1.75
plactreat08	-1.82	-2.26	-0.52	-0.52
	-1.12	-1.38	-0.26	-0.26

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Model 1 with controls, Model 2 without controls

Results (see Table 13 and Tables 25 and 26 in the Appendix) tend to confirm the robustness of our previous conclusions.

When we consider NCO5s, i.e. those 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 discontinuity in the behaviour of the subset of treated businesses which are more likely to perceive it as an increase in the probability of an audit.

Coefficients are also non significant for the 2008 placebo regressions when C05s are selected, but, for this subset, they are positive and (sligthly) significant in the complete specification of the 2007 regression.

6.3 Heterogeneity of types

A natural question arising from these results is if the impact of the reform on NCOA5s was differentiated according to whether these businesses had the option to choose ordinary accounting for tax year 2005.

In theory, we can distinguish two cases. The business which did not have a chance to opt for SA may have just *seized the opportunity to evade ('evaders by opportunity')* offered by the audit exemption. On the contrary, the business which opted for OA,although its natural accounting regime was SA, could have done it to *create the opportunity to evade ('evaders by planning').* Unfortunately we do not observe turnover reported for tax year 2004 and, therefore, we cannot identify exactly businesses which opted for OA in 2005. The best we can do is to distinguish between businesses having, in 2005, the legal form of a limited liability company (srl's or spa's), which on average represent 4/5 of businesses legally forced to adopt OA, and other businesses. Thus, we estimate the following DiD model

$$x_{it} = \alpha + \beta Y06 + \gamma LTD05 + \delta Y06LTD05 + CONTROLS \qquad (8)$$

where $LTD05 = 1$ if the business had the legal form of a limited liability company in 2005, and zero otherwise, while $Y06LTD05$ is the interaction term between $Y06$ and $LTD05$. We estimate this equation for the subset of businesses which were non congruous in 2005 and were treated (i.e. were adopting OA) in 2005 and 2006. Thus, a positive (negative) magnitude of δ in (8) implies that the increase in the outcome variable between 2006 and 2005 is higher (lower) for 'evaders by opportunity' than for'evaders by planning' or, conversely, that the former reduce evasion more (less) than the latter.

When the value of inventory is regressed, the coefficient is positive and significant for all specifications and all years (see Table 27). However, when profits or turnover are used as the outcome variable, there is no statistically significant difference-in-differences across the two types of businesses for tax

years 2006 and 2007, with respect to 2005. A positive difference emerges only in 2008, for both variables(see Tables 28 and 29 in the Appendix).

Thus, a difference in the reported level of economic activity, as measured by the value of inventory, emerges and it seems to indicate that 'evaders by planning' reacted less, but, when compliance is more directly measured, no results are seen until 2008 is considered. We conclude by saying that, although there is some indication that the impact of the reform may have been stronger on 'evaders by opportunity' than on 'evaders by planning', the evidence is not clearcut.

7 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 [12]) for the self-reported part of total income reported by Danish dependent workers, and [6] 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- and stable in the medium run. The response is seemingly lower in Regions where the propensity to compliance is known to be lower (the South of Italy) although the evidence on the type of business is not clear. 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, such, as, for example, the US (Slemrod, see [8], conjectures that non-compliance is U-shaped relative to size, i.e. lower among very small (and very large) corporations).

Conversely, these results cast some doubts on the hypothesys that evasion is high among small businesses due to wider opportunities to manipulate accounting books, as somehow suggested in the literature. Actually, the audit exemption whose removal apparently increased compliance was associated to the adoption, by option or by legal obligation, of a more stringent accounting standard. This implies that 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 capital market pressures to disclose "true" profits 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. 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 the audit exemption indicates that there might be some private non-tax advantages arising from ordinary accounting. Thus, the results can be interpreted as suggesting that the adoption of more stringent accounting standards should not be supported by tax incentives.

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 [4]. 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 [7]. 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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8 Appendix: Regression tables and figures

Table 14: DiD of value of inventory

	(1)	(2)	(3)	(4)	(5)	(6)
	inv06(1)	inv06(2)	inv07(1)	inv07(2)	inv08(1)	inv08(2)
	b/t	b/t	b/t	b/t	b/t	b/t
pres_turn	0.195***	0.213***	0.190***	0.207***	0.196***	0.206***
	39.37	44.98	39.94	45.38	35.14	38.67
OA06	30.05***	93.65***	30.57***	96.75***	23.34***	97.06***
	9.722	28.46	9.960	29.78	6.540	27.63
Y06	7.322***	-0.842*				
	10.64	-1.961				
treat06	29.33***	22.77***				
	6.598	4.904				
2.area_geo_cod	19.59***		21.06***		18.99***	
	5.905		6.442		5.195	
3.area_geo_cod	-4.336		-2.614		-3.186	
	-1.431		-0.851		-0.911	
4.area_geo_cod	24.58***		25.39***		27.50***	
	8.418		8.814		8.364	
5.area_geo_cod	23.54***		25.53***		24.56***	
	7.089		7.741		6.373	
surface	-0.00592***		-0.00542***		-0.00448***	
	-6.494		-6.378		-7.698	
sq.surface	1.40e-08**		1.25e-08**		8.42e-09***	
	3.241		3.143		3.883	
1.type	5.375		6.265		32.53**	
	0.748		0.943		3.152	
2.type	13.33		14.49*		30.21**	
	1.833		2.151		2.908	
3.type	147.2***		152.6***		165.7***	
	16.61		18.21		14.11	
sdsnum	-0.307***		-0.289***		-0.870***	
	-15.18		-14.29		-38.92	
Y07			7.516***	-0.304		
			10.73	-0.670		
treat07			31.74***	24.48***		
			7.203	5.287		
Y08					130.7***	0.113
					38.04	0.216
treat08					38.31***	50.46***
					7.561	9.631
_cons	28.16***	4.167***	24.32***	4.600***	74.16***	4.643***
	3.661	9.659	3.384	10.89	6.935	10.06
N	131359	141419	131505	141414	131957	141594

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15: DiD of value of inventory, NC05s

	(1) inv06(1) b/t	(2) inv06(2) b/t	(3) inv07(1) b/t	(4) inv07(2) b/t	(5) inv08(1) b/t	(6) inv08(2) b/t
pres_turn	0.18***	0.19***	0.18***	0.19***	0.18***	0.19***
	21.3	23.4	21.9	24.4	21.0	22.9
OA06	18.2***	49.9***	13.9**	51.0***	9.79*	49.0***
	4.07	11.1	3.12	11.7	2.04	10.6
Y06	0.065	-0.40				
	0.083	-0.72				
treat06	24.0***	25.7***				
	3.90	3.99				
2.area_geo_cod	13.4**		16.0***		14.3**	
	3.05		3.43		2.96	
3.area_geo_cod	2.15		4.65		5.36	
	0.53		1.04		1.14	
4.area_geo_cod	24.7***		25.0***		28.1***	
	6.78		6.81		7.37	
5.area_geo_cod	23.1***		26.1***		25.0***	
	5.94		6.27		5.80	
surface	-0.0029		-0.0022		-0.0021	
	-1.64		-1.21		-1.06	
sq.surface	0.000019*		0.000015		0.000016	
	2.29		1.85		1.80	
1.type	-16.1		-14.4		-7.52	
	-1.65		-1.64		-0.78	
2.type	-10.9		-8.81		-7.15	
	-1.10		-0.98		-0.73	
3.type	70.2***		85.5***		82.3***	
	5.74		7.03		6.45	
sdsnum	-0.027		-0.0053		-0.55***	
	-0.91		-0.17		-15.1	
Y07			0.57	0.43		
			0.71	0.74		
treat07			37.5***	38.7***		
			5.62	5.58		
Y08					83.7***	0.079
					15.0	0.13
treat08					41.7***	53.0***
					5.92	7.15
_cons	13.6	5.21***	7.63	5.36***	73.2***	5.07***
	1.28	7.47	0.77	7.96	6.83	7.10
N	39665	41958	39676	41959	39792	42000

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: DiD of value of inventory, C05s

	(1)	(2)	(3)	(4)	(5)	(6)
	inv06(1)	inv06(2)	inv07(1)	inv07(2)	inv08(1)	inv08(2)
	b/t	b/t	b/t	b/t	b/t	b/t
pres_turn	0.20***	0.22***	0.20***	0.21***	0.20***	0.20***
	33.5	38.6	33.9	38.6	29.4	29.4
OA06	34.7***	109.8***	37.0***	113.6***	28.9***	28.9***
	8.85	26.4	9.51	27.6	6.33	6.33
Y06	10.9***	-1.07				
	11.4	-1.85				
treat06	30.8***	21.3***				
	5.45	3.63				
2.area_geo_cod	22.6***		23.5***		21.3***	21.3***
	5.40		5.77		4.64	4.64
3.area_geo_cod	-5.10		-3.88		-5.39	-5.39
	-1.32		-1.01		-1.21	-1.21
4.area_geo_cod	30.7***		31.2***		31.7***	31.7***
	7.52		7.80		6.82	6.82
5.area_geo_cod	29.4***		30.0***		28.6***	28.6***
	6.14		6.48		5.11	5.11
surface	-0.0071***		-0.0066***		-0.0054***	-0.0054***
	-6.83		-6.86		-10.3	-10.3
sq.surface	0.000017***		0.000015**		0.000010***	0.000010***
	3.31		3.25		4.58	4.58
1.type	22.2*		22.4*		71.3***	71.3***
	2.04		2.20		5.09	5.09
2.type	30.8**		31.2**		67.4***	67.4***
	2.81		3.03		4.79	4.79
3.type	180.8***		182.7***		217.8***	217.8***
	14.3		15.3		13.9	13.9
sdsnum	-0.39***		-0.38***		-0.96***	-0.96***
	-15.8		-15.1		-35.3	-35.3
Y07			11.0***	-0.67		
			11.3	-1.10		
treat07			29.1***	19.0***		
			5.29	3.30		
Y08					142.5***	142.5***
					34.4	34.4
treat08					37.3***	37.3***
					5.81	5.81
_cons	19.7	3.94***	17.1	4.46***	43.9**	43.9**
	1.73	7.32	1.60	8.43	3.07	3.07
N	91694	99461	91829	99455	92165	92165

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17: DiD of profits-NC05s

	(1) prof06(1) b/t	(2) prof06(2) b/t	(3) prof07(1) b/t	(4) prof07(2) b/t	(5) prof08(1) b/t	(6) prof08(2) b/t
pres_turn	0.0184***	0.0192***	0.0205***	0.0197***	0.0191***	0.0178***
	3.504	4.318	4.758	3.838	4.580	3.488
OA06	-7.704***	-0.546	-1.056	-8.320***	-1.503	-7.428***
	-4.148	-0.369	-0.725	-4.581	-1.096	-4.170
Y06	2.350***	2.625***				
	11.75	9.360				
treat06	6.792**	7.186***				
	3.118	3.834				
2.area_geo_cod		-2.550***	-2.890**		-2.230*	
		-3.426	-2.752		-2.399	
3.area_geo_cod		-3.760**	-2.948***		-1.963*	
		-2.997	-3.800		-2.517	
4.area_geo_cod		-7.034***	-7.538***		-6.181***	
		-4.985	-5.235		-4.522	
5.area_geo_cod		-8.673***	-8.356***		-6.282***	
		-7.312	-7.270		-6.488	
surface		-0.00189**	-0.00185**		-0.00169**	
		-2.663	-2.721		-2.951	
sq.surface		1.16e-08**	1.13e-08**		9.35e-09**	
		2.662	2.689		2.891	
1.type		11.96***	14.84***		13.38***	
		4.365	5.413		4.309	
2.type		15.05***	17.99***		16.00***	
		5.407	6.485		5.105	
3.type		-6.737	-4.429		-3.131	
		-1.841	-1.331		-0.888	
sdsnum		-0.0161	-0.0195		-0.0266**	
		-1.536	-1.899		-3.235	
Y07			3.669***	3.357***		
			14.70	18.86		
treat07			7.139***	6.472**		
			4.053	3.077		
Y08					6.814***	2.905***
					5.447	15.04
treat08					4.643**	4.301*
					2.585	2.130
_cons	11.20***	4.869	2.354	11.10***	4.010	11.24***
	28.69	1.619	0.793	29.11	1.233	29.51
N	42056	39739	39752	42056	39836	42056

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18: DiD of profits-C05s

	(1) prof06(1) b/t	(2) prof06(2) b/t	(3) prof07(1) b/t	(4) prof07(2) b/t	(5) prof08(1) b/t	(6) prof08(2) b/t
pres_turn	0.0482***	0.0463***	0.0460***	0.0457***	0.0395***	0.0379***
	22.68	22.86	22.05	16.62	22.87	23.10
OA06	5.125***	4.356**	7.086***	4.624*	9.023***	8.336***
	3.698	2.758	4.703	2.544	7.419	5.611
Y06	4.013***	1.464***				
	12.76	8.763				
treat06	3.736*	1.635				
	2.059	0.846				
2.area_geo_cod	-1.940		-2.289		-2.531*	
	-1.273		-1.357		-2.105	
3.area_geo_cod	-3.953**		-5.453**		-4.236***	
	-3.033		-3.245		-3.460	
4.area_geo_cod	-10.53***		-11.06***		-11.20***	
	-10.20		-8.318		-12.36	
5.area_geo_cod	-9.114***		-9.999***		-10.54***	
	-7.748		-7.799		-9.554	
surface	0.000452		0.000576		0.000180	
	0.971		1.325		0.366	
sq.surface	1.67e-09		1.02e-09		2.68e-09	
	0.752		0.527		1.181	
1.type	18.58***		19.78***		22.02***	
	4.668		4.925		4.950	
2.type	26.51***		27.36***		29.86***	
	6.646		6.787		6.724	
3.type	6.688		5.640		11.77*	
	1.506		1.223		2.482	
sdsnum	-0.0836***		-0.0906***		-0.0726***	
	-9.115		-9.745		-11.20	
Y07			4.774***	2.050***		
			15.28	12.87		
treat07			-1.060	-2.198		
			-0.487	-0.974		
Y08					12.39***	1.685***
					12.79	10.62
treat08					-3.858*	-2.096
					-2.276	-1.278
_cons	10.30*	16.81***	10.71*	16.84***	6.548	17.35***
	2.471	101.5	2.523	82.07	1.454	118.0
N	92007	99814	92140	99814	92359	99814

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 19: DiD of turnover-NC05s

	(1) turn06(1) b/t	(2) turn06(2) b/t	(3) turn07(1) b/t	(4) turn07(2) b/t	(5) turn08(1) b/t	(6) turn08(2) b/t
pres_turn	0.930***	0.928***	0.928***	0.926***	0.947***	0.944***
	241.3	249.0	209.4	217.7	199.0	198.9
OA06	0.407	-5.476***	1.286	-4.355*	-11.22***	-13.20***
	0.274	-3.639	0.728	-2.390	-6.016	-6.385
Y06	-1.051***	0.752***				
	-3.971	3.624				
treat06	8.307***	10.15***				
	5.246	6.510				
2.area_geo_cod	0.886		-0.566		0.133	
	0.878		-0.494		0.0974	
3.area_geo_cod	0.111		-0.890		-0.487	
	0.111		-0.846		-0.400	
4.area_geo_cod	-0.585		-3.102**		-2.124*	
	-0.568		-2.916		-2.130	
5.area_geo_cod	-2.257		-3.451**		-1.977	
	-1.748		-2.580		-1.683	
surface	-0.00246***		-0.00185*		-0.000981	
	-3.736		-2.294		-1.404	
sq.surface	9.11e-09**		7.56e-09		3.10e-09	
	2.888		1.951		1.034	
1.type	7.134**		13.27***		13.19***	
	2.945		4.150		4.368	
2.type	7.156**		14.15***		12.50***	
	2.902		4.374		4.092	
3.type	-4.029		1.531		7.674*	
	-1.462		0.435		2.125	
sdsnum	0.0947***		0.0826***		0.0626***	
	13.03		11.09		6.930	
Y07			0.765**	2.391***		
			3.228	12.63		
treat07			7.141***	8.588***		
			4.197	5.148		
Y08					-6.768***	2.792***
					-4.954	14.62
treat08					27.22***	24.94***
					14.43	12.88
_cons	-23.07***	-3.713***	-26.42***	-3.549***	-25.54***	-4.844***
	-8.772	-13.14	-7.813	-11.16	-7.773	-13.76
N	39739	42056	39752	42056	39836	42056

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 20: DiD of turnover-C05s

	(1) turn06(1) b/t	(2) turn06(2) b/t	(3) turn07(1) b/t	(4) turn07(2) b/t	(5) turn08(1) b/t	(6) turn08(2) b/t
pres_turn	1.014***	1.017***	1.007***	1.010***	1.014***	1.017***
	525.4	556.7	319.1	347.6	524.4	553.4
OA06	25.18***	35.90***	28.28***	38.93***	25.70***	35.54***
	23.95	31.59	19.69	24.82	24.18	31.02
Y06	-4.458***	-7.446***				
	-15.81	-38.53				
treat06	-30.54***	-33.74***				
	-27.36	-30.32				
2.area_geo_cod	-2.308**		-2.499**		-2.277**	
	-2.797		-2.828		-2.652	
3.area_geo_cod	-4.851***		-5.855***		-5.921***	
	-6.455		-6.010		-6.758	
4.area_geo_cod	-6.154***		-8.161***		-8.708***	
	-6.917		-9.179		-9.485	
5.area_geo_cod	-4.989***		-7.354***		-7.451***	
	-5.181		-7.190		-7.191	
surface	0.00170***		0.00175***		0.00189***	
	4.080		4.096		3.729	
sq.surface	-1.79e-09		-2.42e-09		-7.48e-10	
	-1.116		-1.466		-0.403	
1.type	-4.673		-3.413		-1.493	
	-0.526		-0.390		-0.155	
2.type	-1.661		0.0466		1.740	
	-0.187		0.00532		0.180	
3.type	13.38		14.68		17.28	
	1.494		1.659		1.776	
sdsnum	-0.0989***		-0.0996***		-0.0442***	
	-16.10		-14.36		-7.961	
Y07			-4.395***	-7.374***		
			-12.71	-30.06		
treat07			-34.08***	-37.00***		
			-28.44	-31.32		
Y08					-1.446	-8.142***
					-1.749	-51.94
treat08					-32.75***	-32.70***
		30			-27.13	-27.77
_cons	26.41**	7.249***	26.36**	7.663***	17.15	7.199***
	2.965	47.78	3.003	36.26	1.775	47.25
N	92007	99814	92140	99814	92359	99814

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 21: DiD of profits, with clusterized errors-NC05s

	(1) prof06(1) b/t	(2) prof06(2) b/t	(3) prof07(1) b/t	(4) prof07(2) b/t	(5) prof08(1) b/t	(6) prof08(2) b/t
pres_turn	0.0257***	0.0279**	0.0264***	0.0285***	0.0264***	0.0267***
	4.062	3.342	4.361	3.576	4.430	3.344
OA06	-1.476	-6.967**	-1.355	-6.894**	-0.857	-5.722**
	-1.400	-3.190	-1.249	-3.225	-0.705	-2.635
Y06	2.245***	2.278***				
	7.108	7.799				
treat06	5.801***	5.792***				
	5.516	6.047				
2.area_geo_cod	-1.124		-2.357*		-1.905*	
	-1.169		-2.270		-1.987	
3.area_geo_cod	-2.177		-2.021**		-0.829	
	-1.763		-3.132		-1.090	
4.area_geo_cod	-4.248***		-4.900***		-3.742***	
	-6.514		-6.001		-4.395	
5.area_geo_cod	-5.100***		-5.155***		-3.037**	
	-5.596		-5.921		-2.629	
surface	-0.000794		-0.00102		-0.00132	
	-0.867		-0.888		-1.486	
sq.surface	3.55e-09		4.64e-09		5.62e-09	
	0.898		0.908		1.359	
1.type	0.496		3.968		2.854	
	0.0631		0.682		0.462	
2.type	4.299		7.856		6.121	
	0.569		1.411		1.021	
3.type	-16.78*		-13.56*		-13.53*	
	-2.074		-2.241		-2.113	
Y07			3.111***	3.166***		
			8.484	8.995		
treat07			5.483***	5.375***		
			4.435	4.816		
Y08					0.353	0.439
					0.168	0.212
treat08					1.627	1.209
					1.159	0.918
_cons	10.69	8.553***	7.540	8.411***	9.212	10.00***
	1.330	5.816	1.275	5.921	1.456	6.405
N	39739	42056	39752	42056	39836	42056

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 22: DiD of profits, with clusterized errors-C05s

	(1) prof06(1) b/t	(2) prof06(2) b/t	(3) prof07(1) b/t	(4) prof07(2) b/t	(5) prof08(1) b/t	(6) prof08(2) b/t
pres_turn	0.0596***	0.0580***	0.0563***	0.0569***	0.0471***	0.0460***
	8.553	7.693	8.758	7.466	9.052	8.291
OA06	5.092**	0.600	6.543***	1.341	8.144***	4.320**
	2.999	0.368	4.096	0.734	4.747	3.297
Y06	1.256	1.286				
	1.213	1.732				
treat06	0.417	0.554				
	0.168	0.306				
2.area_geo_cod	-0.719		-1.140		-1.432	
	-0.836		-1.112		-1.844	
3.area_geo_cod	-2.046		-3.401*		-1.931	
	-1.634		-2.011		-1.563	
4.area_geo_cod	-5.871***		-5.631***		-6.235***	
	-3.755		-3.607		-4.878	
5.area_geo_cod	-4.301*		-4.637**		-5.316**	
	-2.468		-2.743		-3.254	
surface	0.000565		0.000705		0.000491	
	1.445		1.534		1.098	
sq.surface	1.08e-09		7.10e-10		1.36e-09	
	0.731		0.496		0.895	
1.type	12.63*		13.59		20.50***	
	1.985		1.802		3.643	
2.type	18.24**		19.29*		26.52***	
	2.623		2.459		4.240	
3.type	-5.494		-4.434		4.968	
	-0.857		-0.597		0.853	
Y07			1.981*	1.949*		
			2.091	2.597		
treat07			-2.344	-2.181		
			-0.897	-1.081		
Y08					-4.542	-5.047*
					-1.802	-2.333
treat08					-4.034	-3.559
					-1.112	-1.235
_cons	3.586	15.23***	2.540	14.82***	0.678	20.38***
	0.549	8.661	0.331	8.411	0.114	12.68
N	92007	99814	92140	99814	92359	99814

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 23: DiD of log of profits NC05s

	(1) lprof06(1) b/t	(2) lprof06(2) b/t	(3) lprof07(1) b/t	(4) lprof07(2) b/t	(5) lprof08(1) b/t	(6) lprof08(2) b/t
lpturn	0.466***	0.444***	0.468***	0.444***	0.469***	0.448***
	80.82	85.12	81.83	84.71	82.01	84.03
OA06	-0.141***	-0.255***	-0.153***	-0.256***	-0.146***	-0.262***
	-8.693	-15.39	-9.321	-15.45	-8.860	-15.74
Y06	0.148***	0.122***				
	14.48	12.48				
treat06	0.101***	0.0777***				
	5.274	4.013				
2.area_geo_cod	-0.0511***		-0.0442**		-0.0630***	
	-3.742		-3.175		-4.407	
3.area_geo_cod	-0.0970***		-0.102***		-0.0992***	
	-7.076		-7.288		-6.910	
4.area_geo_cod	-0.275***		-0.295***		-0.284***	
	-22.06		-23.08		-21.74	
5.area_geo_cod	-0.270***		-0.295***		-0.280***	
	-17.76		-18.78		-17.59	
surface	0.00000602		0.00000775*		0.00000779*	
	1.436		2.166		2.003	
sq.surface	-1.23e-11		-2.19e-11		-1.97e-11	
	-0.512		-1.022		-0.787	
1.type	1.520**		1.460***		0.997**	
	2.930		4.000		2.622	
2.type	1.587**		1.519***		1.060**	
	3.058		4.159		2.788	
3.type	1.060*		1.020**		0.541	
	2.042		2.789		1.423	
sdsnum	-0.00137***		-0.00159***		-0.00125***	
	-14.44		-16.66		-14.60	
Y07			0.160***	0.132***		
			15.33	13.02		
treat07			0.101***	0.0796***		
			5.220	4.047		
Y08					0.319***	0.133***
					19.05	12.96
treat08					0.0427*	0.0540**
					2.131	2.670
_cons	-0.650	0.683***	-0.556	0.679***	-0.147	0.665***
	-1.250	31.32	-1.517	30.99	-0.385	29.94
N	34801	36845	34734	36756	34309	36246

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 24: DiD of log of profits C05s

	(1) lprof06(1) b/t	(2) lprof06(2) b/t	(3) lprof07(1) b/t	(4) lprof07(2) b/t	(5) lprof08(1) b/t	(6) lprof08(2) b/t
lpturn	0.391***	0.367***	0.389***	0.365***	0.387***	0.360***
	102.0	108.6	102.5	108.6	102.4	107.7
OA06	-0.0139	0.0261*	-0.0106	0.0312**	0.00980	0.0384***
	-1.323	2.483	-1.007	2.972	0.927	3.662
Y06	0.102***	0.0327***				
	16.09	5.375				
treat06	0.0599***	0.00199				
	5.097	0.169				
2.area_geo_cod	-0.0278***		-0.0314***		-0.0274***	
	-3.606		-3.996		-3.401	
3.area_geo_cod	-0.149***		-0.154***		-0.142***	
	-18.15		-18.29		-16.65	
4.area_geo_cod	-0.373***		-0.389***		-0.387***	
	-43.13		-43.89		-42.84	
5.area_geo_cod	-0.351***		-0.369***		-0.370***	
	-30.71		-31.64		-31.25	
sq.surface	-3.79e-12		-4.48e-12		-2.68e-12	
	-0.834		-0.975		-0.495	
1.type	1.084***		0.906***		0.785**	
	3.324		4.216		2.932	
2.type	1.251***		1.065***		0.933***	
	3.834		4.954		3.487	
3.type	0.885**		0.703**		0.570*	
	2.712		3.268		2.127	
sdsnum	-0.00236***		-0.00245***		-0.00194***	
	-40.86		-41.89		-40.00	
Y07			0.102***	0.0328***		
			15.50	5.192		
treat07			0.0539***	-0.00298		
			4.488	-0.247		
Y08					0.306***	0.0207**
					31.36	3.203
treat08					-0.0351**	-0.00748
					-2.866	-0.609
_cons	0.582	1.396***	0.786***	1.407***	0.850**	1.422***
	1.782	99.84	3.647	101.3	3.171	102.9
N	86360	93558	85937	92961	84926	91679

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 25: Placebo DiD of profits- 2007 vs 2006

	(1) placNCO5 (1) b/t	(2) placNC05 (2) b/t	(3) placC05 (1) b/t	(4) placC05(2) b/t
pres_turn	0.021***	0.018***	0.047***	0.047***
	6.46	5.72	21.9	17.6
OA07	4.59**	-0.72	9.51***	5.47**
	3.09	-0.40	6.78	3.28
Y07	0.99***	1.02***	0.54**	0.59***
	4.59	4.88	3.11	3.37
plactreat07	-0.11	-0.30	-5.18*	-3.94
	-0.059	-0.16	-2.31	-1.75
1.area_geo_cod	0		0	
	.		.	
2.area_geo_cod	-2.43*		-3.14	
	-2.28		-1.83	
3.area_geo_cod	-5.02***		-7.34***	
	-3.93		-4.91	
4.area_geo_cod	-9.59***		-15.4***	
	-9.74		-11.6	
5.area_geo_cod	-9.98***		-13.6***	
	-8.49		-11.9	
surface	-0.0024**		0.00057	
	-3.11		1.71	
sq.surface	0.000000017**		6.1e-10	
	3.18		0.52	
0.type	0		0	
	.		.	
1.type	14.5***		14.4***	
	5.59		3.99	
2.type	19.2***		22.8***	
	7.25		6.27	
3.type	-1.90		1.83	
	-0.53		0.43	
_cons	3.15	13.6***	7.59*	18.2***
	1.17	47.6	2.03	74.5
N	39851	42056	92367	99814

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 26: Placebo DiD of profits- 2008 vs 2007

	(1) placNCO5 (1) b/t	(2) placNC05 (2) b/t	(3) placC05 (1) b/t	(4) placC05(2) b/t
pres_turn	0.021***	0.017***	0.039***	0.039***
	6.96	5.83	21.3	21.3
OA08	3.55**	-0.59	7.81***	7.81***
	2.75	-0.39	5.62	5.62
Y08	-0.53**	-0.44*	-0.48**	-0.48**
	-2.65	-2.24	-2.89	-2.89
plactreat08	-1.82	-2.26	-0.52	-0.52
	-1.12	-1.38	-0.26	-0.26
1.area_geo_cod	0		0	0
	.		.	.
2.area_geo_cod	-2.08		-3.70*	-3.70*
	-1.72		-2.56	-2.56
3.area_geo_cod	-3.26***		-7.48***	-7.48***
	-3.97		-5.25	-5.25
4.area_geo_cod	-8.72***		-15.6***	-15.6***
	-8.81		-12.9	-12.9
5.area_geo_cod	-7.48***		-14.4***	-14.4***
	-7.77		-13.7	-13.7
surface	-0.0021**		0.00018	0.00018
	-3.26		0.43	0.43
sq.surface	0.000000013**		2.0e-09	2.0e-09
	3.00		1.08	1.08
0.type	0		0	0
	.		.	.
1.type	16.0***		15.1***	15.1***
	5.73		3.93	3.93
2.type	20.2***		23.8***	23.8***
	7.18		6.17	6.17
3.type	2.33		5.59	5.59
	0.71		1.30	1.30
_cons	1.81	14.6***	8.17*	8.17*
	0.63	54.4	2.07	2.07
N	39948	42056	92719	92719

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 27: Heterogeneity of value of inventory within NC05s

	(1)	(2)	(3)	(4)	(5)	(6)
	inv06(1)	inv06 (2)	inv07(1)	inv07(2)	inv08(1)	inv08(2)
	b/t	b/t	b/t	b/t	b/t	b/t
pres_turn	0.18***	0.18***	0.18***	0.17***	0.18***	0.18***
	20.8	21.2	21.4	21.6	20.7	20.3
ltd	55.4***	64.8***	57.1***	66.4***	33.6***	65.4***
	6.40	7.51	6.60	7.71	3.80	7.53
Y06	9.79	5.71				
	1.83	1.02				
ltdY06	53.1***	47.5***				
	3.69	3.31				
2.area_geo_cod	30.9**		37.1***		33.4**	
	3.09		3.49		3.07	
3.area_geo_cod	3.90		10.0		14.1	
	0.41		0.97		1.30	
4.area_geo_cod	44.0***		43.6***		53.1***	
	4.62		4.57		5.39	
5.area_geo_cod	41.4***		47.9***		55.8***	
	3.83		4.11		4.69	
surface	-0.0036		-0.0027		-0.0020	
	-1.54		-1.12		-0.79	
sq.surface	0.000000022*		0.000000018		0.000000016	
	2.12		1.68		1.42	
sdsnum	-0.23***		-0.20***		-1.00***	
	-4.16		-3.66		-15.8	
Y07			14.2**	9.96		
			2.61	1.77		
ltdY07			76.6***	71.6***		
			4.89	4.59		
Y08					153.2***	12.8*
					13.7	2.21
ltdY08					85.0***	96.7***
					5.22	5.80
_cons	43.6***	36.2***	38.0***	37.9***	136.7***	36.8***
	3.83	7.67	3.31	8.19	11.9	7.63
N	16242	16837	16237	16836	16314	16875

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 28: Heterogeneity of profits within NC05s

	(1) prof06(1) b/t	(2) prof06 (2) b/t	(3) prof07(1) b/t	(4) prof07(2) b/t	(5) prof08(1) b/t	(6) prof08(2) b/t
pres_turn	0.019***	0.021***	0.020***	0.022***	0.019***	0.020***
	4.23	3.96	4.57	4.25	4.41	3.82
ltd	-22.7***	-22.0***	-23.3***	-22.4***	-22.9***	-21.5***
	-8.72	-7.18	-8.91	-7.27	-8.66	-7.07
Y06	8.39***	7.92***				
	8.09	8.26				
ltdY06	4.24	2.86				
	0.94	0.56				
2.area_geo_cod	-4.40**		-4.76*		-2.92	
	-2.64		-2.03		-1.40	
3.area_geo_cod	-6.24*		-3.99*		-1.82	
	-2.18		-2.17		-1.00	
4.area_geo_cod	-9.85**		-10.5**		-7.15*	
	-2.66		-2.76		-1.99	
5.area_geo_cod	-15.9***		-14.7***		-8.79**	
	-4.73		-4.51		-3.25	
surface	-0.0023*		-0.0022*		-0.0020**	
	-2.45		-2.47		-2.69	
sdsnum	-0.024		-0.028		-0.038*	
	-1.31		-1.51		-2.55	
Y07			9.35***	8.50***		
			9.36	8.89		
ltdY07			4.34	3.03		
			1.03	0.62		
Y08					9.21***	4.02***
					3.90	3.78
ltdY08					9.28*	7.64
					2.21	1.61
_cons	22.4***	11.0***	22.1***	10.6***	21.5***	11.6***
	7.76	4.91	7.55	4.86	8.16	5.31
N	16309	16928	16308	16928	16355	16928

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 29: Heterogeneity of turnover within NC05s

	(1) turn06(1) b/t	(2) turn06 (2) b/t	(3) turn07(1) b/t	(4) turn07(2) b/t	(5) turn08(1) b/t	(6) turn08(2) b/t
pres_turn	0.93***	0.93***	0.93***	0.93***	0.95***	0.95***
	237.8	246.5	205.9	214.2	195.7	195.3
ltd	-11.2***	-16.3***	-11.0***	-15.3***	-19.5***	-21.6***
	-5.35	-8.14	-4.81	-7.08	-7.98	-9.46
Y06	4.00***	8.34***				
	3.42	7.32				
ltdY06	1.77	6.10				
	0.48	1.72				
2.area_geo_cod	2.17		-0.66		0.92	
	0.94		-0.25		0.30	
3.area_geo_cod	0.99		-1.12		-0.38	
	0.42		-0.46		-0.14	
4.area_geo_cod	0.87		-4.15		-2.17	
	0.33		-1.51		-0.85	
5.area_geo_cod	-4.21		-6.38		-3.63	
	-1.17		-1.70		-1.12	
surface	-0.0030***		-0.0023*		-0.0013	
	-3.56		-2.14		-1.38	
sq.surface	0.000000012**		9.8e-09		4.6e-09	
	2.92		1.90		1.15	
sdsnum	0.16***		0.15***		0.11***	
	12.6		11.0		7.25	
Y07			5.83***	9.70***		
			4.90	8.43		
ltdY07			-0.86	2.94		
			-0.21	0.77		
Y08					0.49	16.6***
					0.20	14.4
ltdY08					31.8***	26.8***
					7.16	5.98
_cons	-24.6***	-3.80*	-19.2***	-2.75	-24.1***	-9.84***
	-8.65	-2.35	-6.02	-1.50	-7.98	-4.84
N	16309	16928	16308	16928	16355	16928

t statistics in second row

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

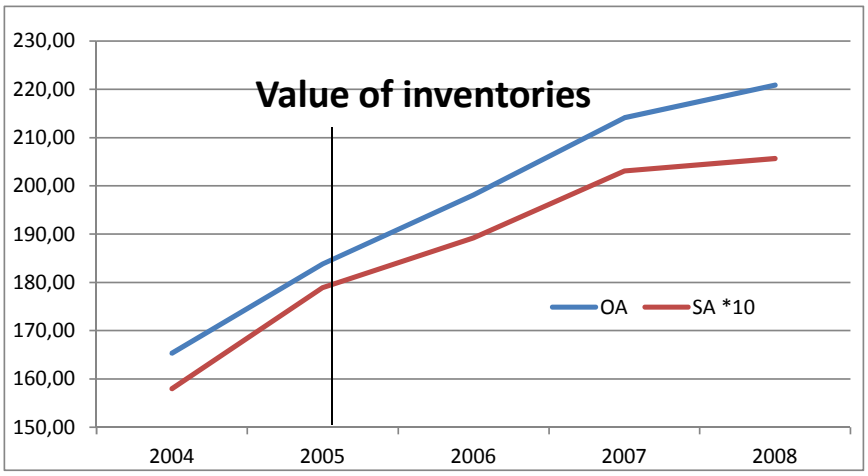

Figure 1: Variation in the value of inventories