



**Political Cycle and Reported Labour Incomes in Italy: Quasi-experimental Evidence on Tax Evasion**

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## Political cycle and reported labour incomes in Italy: a quasi-experimental evidence on tax evasion

### *Provisional Draft*

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*Il prelievo fiscale corretto si aggira intorno a un terzo del reddito, se invece le tasse sono tra il 50 e 60% è troppo e così " è giustificato mettere in atto l'elusione o l'evasione".*

The correct tax burden is about one third of the income; it is too much if the tax burden is around 50 or 60%, thus "it is justified to resort to tax avoidance or evasion."

*Silvio Berlusconi,  
speech during the electoral campaign, April 2008*

### **Abstract**

Tax evasion is a complex phenomenon that depends on many factors and is shaped by the behaviours of policy makers and citizens. Different claims about the acceptability of tax evasion between centre-right and centre-left coalitions clearly emerged in Italy in last decades. The different attitudes towards tax evasion of the two coalitions could have affected tax morale and tax compliance, leading to a relative increase of self-employed reported incomes when the centre-left coalitions governed and *vice versa*. Using a longitudinal dataset recording the entire working life of the sampled individuals, we consider the period 1996-2005 and, following a differences-in-differences approach, where the employees are the control group and the craftsmen and dealers (the self-employed) are the treatment group, we test whether self-employed reported incomes significantly modified when the coalition in charge of Government changed. We find that self-employed earnings significantly reduced during the centre-right wing government; a significant decrease emerges in all deciles, even if it is a bit larger in bottom deciles.

Keywords: tax evasion, political cycle, income inequality

JEL Classification: H26, D63, I31

## 1. Introduction

Since the seminal contribution of Meltzer and Richard (1981), the political economy literature has focused on the relationship between voters, income, politicians and redistribution. In bipartisan models, the main attention is devoted to preferences towards redistribution expressed by left and right wing parties, while no emphasis is usually placed on parties' attitudes towards contrasting tax avoidance and evasion.

However, different claims about the acceptability of tax evasion between centre-right and centre-left coalitions clearly emerged in Italy in the last decades (Livadiotti 2014). As confirmed by several analyses of election results made by political scientists (INES 2001, Caciagli and Corbetta 2002, Diamanti, and Lello 2005, Diamanti 2005, Mastropaolo 2009), self-employed are one of the strongest political constituency of center-right wing parties<sup>1</sup>, while the majority of private and public employees support center-left-wing parties. For instance, Diamanti and Lello (2005) pointed out that "... the blue zone – where the center-right coalition has its highest levels of support – in the North contains a large number of self-employed workers..." and INES (2001 and 2006), analyzing the votes of Italian citizens by occupations, found that in the 2001 elections 63.4% of craftsmen and dealers voted for the center-right coalition and the share rose up to 68.1% in the 2006 elections. As a consequence, right-wing parties should take more attention to needs and requests of professionals and self-employed, that, on the contrary, do not usually support the centre-left coalition considered as shaped by "tax lovers" (Mastropaolo 2009). For instance, Vincenzo Visco, the former ministry of Finance during the centre-left governments in the '90s and '00s is nicknamed "Dracula" by the centre-right oriented press, while tax evaders are considered by the left-wing oriented press as the most powerful Italian lobby (Livadiotti 2014).

Actually, as noticed by several studies (Andreoni 1998, Bruce 2000), one of the main differences between self-employed and employees refers to their likely different tax compliance. Indeed, in most of countries, as regards reporting labour incomes, employees and self-employed are characterised by different chances: the former usually get taxes paid on their behalf by the employer, whereas the latter directly deduct taxes from their gross income, so having much more room for manoeuvre to choose strategies for underreporting labour incomes (e.g. artificially reducing proceeds of increasing production costs).

As a consequence, *ceteris paribus*, different parties' attitudes towards self-employed could affect some determinants of tax evasion (e.g. the penalties, the probability to receive an audit or the tax morale), hence shaping their propensity to correctly report labour incomes. When a pro self-employed party is on charge of the Government this group of workers could feel an atmosphere more favourable to their wishes and fear less to be checked and prosecuted in case of "inaccurate" tax files. Moreover, different policies (e.g. fiscal amnesty or new measures and different enforcement effort by the tax administration authorities) could be implemented by different oriented parties when they took charge of the government, hence further affecting the convenience or the aptitude of citizens to under-report their incomes.

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<sup>1</sup> Note that the share of self-employed is much higher in Italy than in the other EU countries (23.1% in Italy vs an EU28 average amounting to 14.8%; Eurostat 2012), representing about 10-12 millions of voters.

As known, Italy is characterized by a high level of tax evasion due to both unreported jobs and a low tax compliance (Schneider and Enste 2000); according to Istat (2010), the share of hidden economy was comprised between 16,3% and 17,5% of the Italian GDP in 2008. However, it is very difficult to study in depth the impact of political cycles on tax compliance, because usually governments are on charge in Italy for very limited periods and, mostly, because since 1946 (when the Italian Republic was born) up to 1994 (when the so-called first Republic ended) the same party, the Center Catholic *Democrazia Cristiana*, was on charge of the Government, having the relative majority of votes. The only complete political cycle happened in Italy in the decade 1996-2005, when the centre-left coalition was in charge of the Government for a five-year period (April 1996-April 2001, even if the premiership changed three times during that period) and, afterwards, the centre-right coalition (led by Silvio Berlusconi) governed uninterruptedly from April 2001 to March 2006.

It could be then interesting to analyze whether self-employed tax compliance changed in that decade according to the political cycle. Actually, the supposed different attitudes towards tax evasion of the two coalitions that were alternatively in charge of the Government in Italy in the decade 1996-2006 could have led to a relative decrease of self-employed reported incomes – compared to employees – when the centre-right coalition governed.

Of course, we neither have at our disposal data on the effective incomes earned by self-employed and employees (a hidden information), nor we rely on data on the amount of individual tax evasion found by fiscal administration. Instead, we follow an indirect strategy and – using a new panel dataset built merging the IT-SILC 2005 sample with the longitudinal information about the entire working life of this sample taken from the administrative archives managed by the Italian Social Security Institute (INPS), where annual gross earnings are recorded – we estimate whether self-employed labour incomes changed when the coalition in charge of Government changed.

More precisely, we follow a difference-in-difference approach, considering the employees (whose chances to underreporting earnings is very limited and, usually, independent on their choices) as the control group and craftsmen and dealers (the typologies of self-employed tracked in INPS archives) as the treatment group, considering the coalition change in 2001 as the shock. Then, controlling for several individual characteristics, business cycles and time trends, we carry out panel estimates as to measure whether self-employed earnings, compared to employees earnings, significantly reduced from 1996-2000 to 2001-2005.

The paper is organized as follows. We briefly review the literature on tax compliance and political cycle (section 2). Then (section 3) we review the main anti-evasion measures implemented in Italy in the last decades and the measures that could have modified gross earnings of self-employed and employees. Afterwards we present the characteristics of the used panel dataset (section 4) and the empirical strategy (section 5). Finally (section 6) we present the main findings, showing the results of panel estimates, in particular those carried out through an individual fixed effect model (section 6.1), also testing whether the relative income of self-employed in the two five-year periods changed along the income distribution, using the Canay (2011) methodology that implements quantile regression in fixed effects model (section 6.2). Section 7 concludes summing up the main findings.

## 2. Tax compliance and political cycle: related literature

Tax evasion is a complex phenomenon that arises from the interaction of behaviors of different actors: the central government fixes the tax law and the citizens, on the one hand, modify their behavior in response to legislation and as voters, on the other hand, determine the political results. The literature on tax evasion, election cycle and redistribution is too large to be reviewed here (see Persson and Tabellini 2000 and 2004); in this section, we briefly summarize the main contributions useful to the aims of this paper.

The tax evasion phenomenon has been broadly studied from different point of view. At the same time, also the effects of the political cycle on the economic variables – as the relationship between voters, income and redistribution – have been investigated. Since the seminal contributions of Kalecki (1971) and Nordhaus (1975), several scholars (e.g. Hibbs 1977, Alesina 1987, Rogoff 1990) showed the existence of a political cycle on the economic variables (gdp growth, inflation and unemployment rates, tax rates). However, Rogoff (1990) noticed that tax evasion is not easily observable into the policy games. In partisan models Alesina (1987) argued that tax evasion can be considered a latent variable – relaxed enforcement of selected laws – that affects a particular type of mis-governance before and after the elections.

Other scholars, as known, focused on the relationship between voters, income and redistribution (e.g. Romer 1975, Roberts 1977, Meltzer and Richard 1981), suggesting that higher market incomes inequality (i.e. a median income lower than mean income) engenders higher level of political support for redistributive policies, thus increasing tax rates. On the empirical side, this statement is confirmed by Alesina and Rodrik (1994) and Persson and Tabellini (1994), while Perotti (1996) does not find supporting evidence. However, also this class of models does not explicitly include tax evasion.

The determinants of tax compliance and evasion have instead been broadly studied both on theoretical and empirical sides since the seminal contribution of Allingham and Sandmo (1972)<sup>2</sup>. According to their model, the rational taxpayer decides the amount of the income to report and the quantity to evade at the moment of filling his/her income tax file. The decision is affected by the probability to be detected by the tax authority in case of underreporting. If the tax authority discovers the hidden income, the taxpayer will pay a penalty. This approach gives the reasonable result that tax compliance depends on audit rates and fine rates. Furthermore, in the last two decades, several scholars have highlighted as the behaviors of taxpayers are also affected by social interactions (Erard e Feinstein 1994, Fortin et al. 2004, Wenzel 2002). This assumption shows that many economic decisions are made combining typical elements of rationality with other elements that can be affected by factors connected with the subjective perception of the phenomena or the behaviour of other members of the community (Kirchler 2007)<sup>3</sup>. For instance, Feld and Frey (2007) argue that tax compliance is «a complicated interaction of deterrence measures and responsive regulation», thus the citizens develop a sort of “psychological tax contract” with the State on the

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<sup>2</sup> For an exhaustive review of this literature, see Andreoni et al. (1998) and Schneider and Enste (2000).

<sup>3</sup> The role of culture and beliefs as factors that affected the behavior of agents has been the subject of renewed attention in literature about “cultural economics” (McCleary and Barro 2006, Guiso et al. 2004 and 2006).

base of: the fiscal exchange (public services vs tax paid), political procedures and the personal relationship between the taxpayers and the tax administrators.

The theoretical investigation of the factors affecting individual tax evasion has been followed by a large number of works (e.g. Cowell 1981, Engel and Hines 1994, Sandmo 1981 and 2004), while, from a different perspective, several studies, following different approaches<sup>4</sup>, have tried to estimate the size of tax evasion (e.g. Macafee 1980, Tanzi 1980, Pissarides and Weber 1989, Plate et al. 1990). According to the most recent estimates (Istat 2011), the share of hidden economy – a good proxy of the extent of tax evasion – was comprised between 16,3% and 17,5% of the GDP in Italy in 2008, while the size of tax evasion in Italy has been estimated (Table 1) through various types of data and approaches (see Table 1).

Table 1: Tax evasion estimates in Italy: microeconomic and macroeconomic approaches

Authors	Approach	Reference Year	Main findings
<i>Bernardi and Bernasconi, (1996)</i>	Macroeconomic	1991	26.0% of the tax base evaded; 8.5% for income from dependent work, 62.8% for self-employment income. The tax evaded is equal to 12.9% for dependent workers and to 68.5% for self-employed
<i>Bernasconi and Marenzi (1997)</i>	Microeconomic (Comparison with household surveys)	1991	Evaded tax base is 4% for dependent workers, 11% for pensioners, 53% for entrepreneurs and 30% for professionals
<i>Bernardi, (1996)</i>	Macroeconomic	1994	22.9% of the tax base evaded; 8.5% for income from dependent work and pensions, 59.5% for self-employment income
<i>D'Amuri and Fiorio (2005)</i>	Microeconomic (Comparison with household surveys)	2000	Self-employed show high evasion rates (between 71% and 8%) in all income deciles, decreasing with income. Dependent work show high evasion rates only in the lowest income deciles
<i>Mantovani and Nienadowska (2006)</i>	Microeconomic (Comparison SHIW with Ministry of Finance data)	2002	On average 20% of the total income is evaded. Self-employed (51%) . Wages and salaries (-4%)
<i>Bovi and Dell'Anno (2010)</i>	Macroeconomic	2003	Size of the Shadow Economy is 34.6% of GDP
<i>Zizza and Marino (2008)</i>	Microeconomic (Comparison SHIW with Sogey tax records)	2004	On average 13.5% of income is hidden to the Tax Authorities. The independent workers evaded (56.3%) more than dependent workers (-1.6%)
<i>Schneider and Enste (2000)</i>	Multiple- Indicator-Multiple-Cause (MIMIC) model	2008	Size of the Shadow Economy is 21.4% of GDP

<sup>4</sup> Indirect or direct methods are used in order to estimate tax evasion. Indirect approaches are based on the comparison of macroeconomic aggregates (such as national accounts, electricity consumption, monetary variables), while direct methods are based on statistical surveys. Usually, indirect methods overestimate of tax evasion, while direct methods underestimate it.

All these studies clearly point out that the share of underreported income is hugely higher among self-employed than among employees. For instance, the recent estimates by Zizza and Marino (2008), carried out comparing individual survey data with the administrative evidence provided by the tax files, find that self-employed underreport 56,3% of their earnings, while, on average, employees correctly report their labour incomes to the fiscal authorities. As concerns the Italian geographical areas, a higher size of tax evasion and hidden economy is usually found in the South, but this evidence could be affected by the underdeveloped productive structure of the Southern economy (that is more exposed to tax evasion due to its very large share of small tertiary and agricultural activities and small firms) rather than by a lower tax morale and a higher attitude to evade of Southern citizens (Santoro 2010).

On the theoretical side, the political cycle could affect individual tax compliance when policy makers belonging to the various parties differently affect the two groups of determinants of tax evasion highlighted by the economic literature: i) audit frequency, penalty sizes, tax rates (Allingham and Sandmo 1972); ii) affecting tax morale, social norms and the perceptions on the opportunities to evade incomes (Kirchler 2007). However, despite of the broad literature focusing on tax compliance and evasion and their determinants, to the best of our knowledge a very limited attention has been devoted to study the links between politicians' attitudes and tax compliance. Partial exceptions are Kim (2007) and Skouras and Christodoulakis (2011). Kim (2007) provides a theoretical model taking into account the interactions between tax authority and the sovereign government and suggests that tax evasion is influenced by the government's intention to control the economy. Skouras and Christodoulakis (2011) showing that there is a significant increase of tax evasion in the period around the elections in Greece and interpret this evidence as "a type of misgovernance which arises from electoral cycles".

As for Italy, to the best of our knowledge, no studies have analyzed the link between the political cycle and the sizes of tax evasion and hidden economy through a robust econometric strategy in Italy. The only descriptive picture highlighting a link between the different Government coalitions and the size of tax evasion is that found in a contribution on the online economic magazine "La Voce" by Fiorillo and Gallegati (2008, updated to the most recent years by Gallegati in Livadiotti 2014), who consider as a proxy of tax evasion in the period 1982-2012 the gap between the apparent tax burden (computed including the shadow economy in the GDP) and the real tax burden (computed excluding shadow economy from GDP) and point out that, according to this indicator, tax evasion rises during the center-right Government, while it decreases when a center-left coalition ruled and this evidence is particularly clear in the period 1996-2005 that we consider in this paper. Consistently, as an indirect sign of the link between political cycle and tax evasion, a descriptive report by LEF (2012) highlights – without controlling for business cycles and other possible determinants – that during the center-left Governments a positive difference between the growth of the proceeds on which VAT are computed and the GDP emerged, while, on the contrary GDP growth rate exceeded VAT tax base growth when the center-right coalition ruled.

### 3. Political cycle and anti-evasion measures in Italy

In this section we first describe the characteristics of the political cycle in Italy in the period 1996-2005 and the main measures implemented in those years, also in order to assess whether the supposed different attitudes in contrasting tax evasion by the two coalitions emerged. Then, we describe the rules about contribution rates, that differ among self-employed and employees and can affect the comparisons of their gross earnings.

As remarked in the introduction, during the so-called “first Republic” – lasted since 1946 to 1994, when the new majority vote system was introduced instead of the previous pure proportional system, favouring the creation of two contrasting coalitions –, Italy was always governed by coalitions led by the Center Christian Democratic party (*Democrazia Cristiana*). Therefore, a political cycle did not emerge at all. Afterwards, the centre-right wing coalition (continuously led by Silvio Berlusconi) went in charge of the Government in March 1994, but its government was replaced at the beginning of 1995 by a “technical Government” (led by the former Ministry of Economy Lamberto Dini, who appointed no politicians as Ministries) supported by both some left and centre-right parties<sup>5</sup>, whose main aim was the implementation of a structural pension reform.

Then, two coalitions - centre-right (blue label) and centre-left (red label) in figure 1 – have been alternatively in charge of the Government in Italy since the beginning of 1996 to the end of 2011, when the Berlusconi government was replaced by a technician cabinet led by Mario Monti, supported by a *grosse coalition* that included both center-right and center-left coalitions. However, only from in the decade 1996-2005 the ruling coalition was able maintain in charge of the Government for the whole period of office of the legislature (five years). Therefore, an effective political cycle emerged in Italy in such decade only, when the Centre-Left coalition ruled for 5 years<sup>6</sup>, then followed for 5 years by the Centre-Right coalition<sup>7</sup>.

Looking at studies deeply analysing voters behaviours (e.g. Caciagli and Corbetta 2002, Diamanti 2009, Mastropaolo 2009), the centre-left coalition gained most of its preferences in 1996 among voters who considered as priorities the fight against tax evasion and public corruption, the defence of welfare state and public services, the environment protection, the participation at the European Union and at the EMU. On the other hand, in 2001 the centre-right coalition took votes especially from those who considered as priorities lowering taxes, increasing labour market flexibility and fighting against crime and illegal immigration. Observing the voters behaviours in according to their socio-professional categories, in both elections the centre-right obtained a relatively higher electoral support among the self-employed (businessmen, professionals,

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<sup>5</sup> Indeed, the first Berlusconi government (lasted since 10 May 1994 to 17 January 1995) was based on two different electoral alliances: one with the Lega Nord in the North of Italy and another one with Alleanza Nazionale (in the South and in the Center). Suddenly strong contrasts emerged and, after 8 months, the Lega led to the fall of the government because it contrasted the pension reform proposal.

<sup>6</sup> However, during the centre-left ruling the prime Minister changed twice, because Romano Prodi was replaced by Massimo D'Alema at the end of 1998 and D'Alema was then replaced by Giuliano Amato at spring 2000.

<sup>7</sup> The second Centre-Left Prodi Cabinet – based on a very heterogeneous coalition – was on charge for less than 2 years (May 2006 up to January 2008) and the new elections were won again by the Centre-Right coalition.

merchants, craftsmen). As stated in the introduction, around 63 and 68% of craftsmen and dealers voted for the centre-right coalitions at the 2001 and 2006 elections, respectively.

Fig. 1: Government coalitions in Italy from 1994 to 2008 (red: center-left; blue: center-right)



Moreover, in public debates, also during the electoral campaigns, different claims about the acceptability of tax evasion between centre-right and centre-left coalitions clearly emerged in Italy. On the one hand, the centre-left coalitions argued that fighting against tax evasion would have been a national priority and appointed as ministry of Finance or Economy Vincenzo Visco, an economist who has devoted his activity to introduce anti tax evasion measures; on the other hand, Silvio Berlusconi, the leader of the centre-right coalition since 1994, has repeatedly stated that to evade taxes when tax burdens exceeds 50% is a sort of a sort of legal citizens self-defence. Consistently with those different attitudes towards contrasting evasion, measures differently oriented – both in terms of new measures and different enforcement effort by the tax administration and control authorities – were implemented by the two coalitions when they took charge of the Government (see Table 2).

In particular, two measures are consistent with the idea of a different attitude of the two coalitions towards tax avoidance and evasion. The centre-left Government phased in the Audit scheme (*Studi di settore*), aimed at contrasting tax evasion defining the plausible proceed that a firm or self-employed, with certain detailed characteristics, should earn in a year and asking those not achieving that proceed to justify the discrepancy to the fiscal authority<sup>8</sup>. Conversely, during government of the centre-right coalition the “Forgery in balance sheet”, which decriminalized

<sup>8</sup> For details see Arachi and Santoro (2007).

fraud and corporate crimes, and two tax amnesties (in 2002 and 2003) were introduced<sup>9</sup> (during the centre-left government periods only a tax contribution amnesty following the structural 1995 pension reform was introduced).

Table 2: Main measures introduced in Italy from 1994 to 2006

<i>Year</i>	<i>Government</i>	<i>Main Acts of Parliament</i>
1996	Technical-C-L	Tax contribution amnesty (DL.295/1996); +0.30% of contribution rate for dealers (L. 662/1996)
1997	C-L	+0.8% contribution rate for dealers and craftsmen (L. 449/1997)
1998	C-L	Audit scheme (Studi di Settore; DL 331/1993-L 427/1993 extended in 1998)
1999	C-L	
2000	C-L	
2001	C-L then C-R	+0.09% yearly increase of contribution rate for dealers until to 2006 (L. 448/2001)
2002	C-R	Tax amnesty (L.289/2002); "Forgery in balance sheet" (d.lgs. 11/4/02 n. 61)
2003	C-R	Tax amnesty (L.350/2003)
2004	C-R	
2005	C-R	

Actually, pension contribution rates differ among employees and self-employed. Since 1996 the first pay a 33% rate, while self-employed enrolled to the National Social Security Institute (INPS, i.e. craftsmen and dealers) pay a lower rate<sup>10</sup>, that has however been increased, especially since 2006 up to 24%. Furthermore, differently from employees, since 1990, craftsmen and dealers are obliged to pay a fixed amount of contribution when their annual earnings are lower than a specific amount. In other terms, pension contributions are based on a minimum income that is due also when total earnings computed for tax purposes are below a specific threshold.

<sup>9</sup> A contrasting debate concerns the effects of tax amnesty on tax compliance (Hasseldine 1998, Andreoni 1991). On the one hand, it could exert a positive effect on short-term and long-term revenues on those individuals that would like to re-join the tax system but are constrained by the fines. On the other hand, tax amnesty could provide incentives for honest taxpayers to start evading taxes because they anticipate future new amnesties.

<sup>10</sup> Professionals (e.g. lawyers, architects) enroll to the private pension fund managed by their professional order.

## 4. Data

In this paper we use a new longitudinal dataset on individual working histories, called AD-SILC, recently built merging the IT-SILC 2005 survey sample (i.e. the Italian version of EU-SILC 2005, carried out by ISTAT) with the administrative records on individual working histories since their entry in the labour market, that are collected in the administrative files managed by the Italian National Social Security Institute (INPS). AD-SILC is the first panel available for Italy that allows to observe individual working histories since their entry in the labour market up to 2009 and collects detailed information on individual gross earnings, working statuses and characteristics (e.g. region of work, type of contractual arrangement, education).

Actually, a great deal of longitudinal data is collected in the administrative archives managed by INPS (the Italian Social Security Institute), which, among the others, record, on a yearly base, for each working episode gross earnings (i.e. net earnings plus personal income taxes and contributions paid by the worker)<sup>11</sup>. Therefore AD-SILC is a retrospective panel – being the reference population that surveyed by ISTAT in 2005 – and is composed of about 1.2 million observations concerning 43,388 individuals recorded at least once in administrative files.

Differently from the other datasets previously based on INPS data (e.g. the WHIP and the CLAP datasets) that only follows private employees and some groups of self-employed (i.e. craftsmen, dealers, farmers and parasubordinate workers) since a given year (1985), AD-SILC allows to identify the working histories since the beginning of the career and also includes information about working careers of public employees and professionals. However, due to some limits in the earnings records for professionals and public employees in the '90s, the analysis of this paper will be carried out comparing only individuals enrolled to INPS, in particular comparing private employees to self-employed (craftsmen and dealers). Administrative archives record the specific kind of pension funds where workers pay their contributions, so allowing to precisely distinguish (for each job relationship had during a year) private employees, craftsmen and dealers.

The administrative sources allow to exactly reconstructing for each individual the time of entry in the labour market, actual experience (i.e. the effective number of worked years since the entry in the labour market) and annual gross earnings<sup>12</sup>. For private employees gross earnings include only employees contribution rate (currently 9%), while craftsmen' and dealers' gross earnings include the total contribution rate paid by them (currently 24%). Furthermore, AD-SILC allows to include further individual controls, as the Region where the individual works, gender, education, age, and actual labour market experience (computed in weeks since the entry in the labour market).

In this paper we focus on a sample of 127,515 observations concerning 18,521 individuals followed in the decade 1996-2005 and working as private employees, craftsmen of dealers (Table 3). Moreover, in order to avoid possible endogenous choice to move between employment and

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<sup>11</sup> Administrative data are much less plagued by measurement errors than survey data. By their nature, administrative archives are not balanced – because individuals are followed for a different number of years since the moment they start to work – and not plagued by attrition: if someone disappears from the archives it means that he/she has stopped to work or has gone to work abroad.

<sup>12</sup> For reducing the impact of outliers we dropped, in each year, the top 1% and those earning less than 1,000 Euros (at 2010 prices).

self-employed during the political change, in our baseline estimates we do not consider those individuals moving from self-employment to private employment (or *vice versa*) in the observed 10 years period. Due to these restrictions, the final sample used in our main estimates is composed by 17,263 workers and 117,396 observations. More in detail, looking at individuals, the share of private employees is equal to 81.7% while 18.3% of the workers are self-employed (9.0% craftsmen and 9.3% dealers).

Table 3: Sample size

<b>Observations</b>	<b>Values</b>	<b>%</b>
Private Employees	100,026	78.4
Craftsmen	14,192	11.1
Dealers	13,297	10.4
<i>Total</i>	<i>127,515</i>	<i>100.0</i>
<b>Not moving across occupations</b>	<b>Values</b>	<b>%</b>
Private Employees	94,897	80.8
Craftsmen	11,734	10.0
Dealers	10,765	9.2
<i>Total</i>	<i>117,396</i>	<i>100.0</i>
<b>Individuals (no movers)</b>	<b>Values</b>	<b>%</b>
Private Employees	14,095	81.7
Craftsmen	1,561	9.0
Dealers	1,607	9.3
<i>Total (no movers)</i>	<i>17,263</i>	<i>100.0</i>
<i>Total</i>	<i>18,521</i>	

Source: elaborations on AD-SILC data

Table. 4: Sample characteristics

	<b>Private Employees</b>	<b>Craftsmen</b>	<b>Dealers</b>	<b>Total</b>
<i>Mean</i>				
Gross annual earnings	17,682	16,011	15,997	17,320
Age	36.6	41.4	41.2	37.6
<i>Distribution by gender</i>				
Males	61.2%	76.9%	59.6%	62.8%
Females	38.8%	23.1%	40.4%	37.2%
<i>Distribution by education</i>				
At most lower secondary	47.0%	62.2%	43.0%	48.3%
At most upper secondary	45.9%	34.6%	51.2%	45.2%
Tertiary	7.1%	3.2%	5.8%	6.5%
<i>Distribution by working area</i>				
North	56.9%	55.7%	51.4%	56.2%
Centre	24.0%	26.0%	23.1%	24.1%
South	19.2%	18.3%	25.5%	19.7%

Source: elaborations on AD-SILC data

The main characteristics of the individuals included in our sub-sample, are shown in table 4, where it emerges that private employees are younger than self-employed, while, on average in the period 1996-2005, their gross annual earnings (17,682 Euros, in constant 2010 prices) of employees is higher than those earned by craftsmen (16,011 Euros) and dealers (15,997 Euros). The highest shares of both private employees and self-employed work in the North of Italy and there is a majority of males in our sample, especially among the craftsmen.

## 5. Empirical strategy

In this section we illustrate the econometric models used in this paper, in order to answer to the following research questions: i) do relative earnings between self-employed and employees change when the coalition in charge of government changes?; ii) is the size of the estimated coefficient constant along the income distribution?

In order to answer to the first research questions we follow a differences in differences (DID) strategy, while the second question is inquired using the quantile fixed effect methodology proposed by Canay (2011) for the estimation of quantile regressions for panel data.

As remarked in section 2, all studies about Italy point out that the underreported income by self-employed is much larger than those by employees. Indeed, the self-employed have much more flexibility in reporting incomes because they directly pay taxes, while the employees' labour income taxes are directly paid by the employer. The different scope for underreporting income between the two types of workers is crucial in our approach, because we assume that the government change (the shock) differently hits the two types of workers.

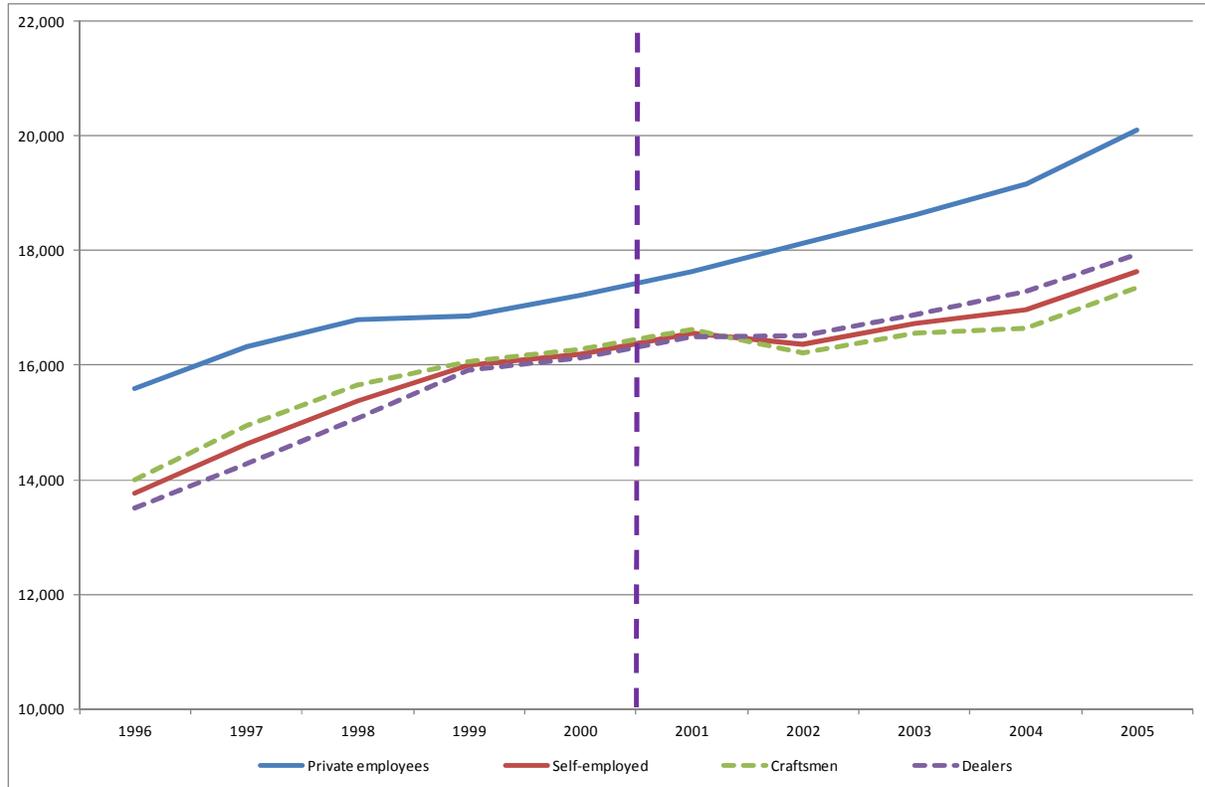
Hence, we make use of the DID method to indirectly estimate self-employed tax evasion, inquiring through individual longitudinal data whether individual annual gross earnings changed when the coalition in charge of the Government changed, controlling for individual fixed effects, time varying characteristics (i.e. age, age square, effective labour market experience and its square, dummies for regions of work), plus business cycle proxies (the annual GDP growth rate and the regional unemployment rate) and time trends (considered through time dummies, also interacted in some robust specifications with dummies for self-employed or private employees, thus considering specific workers' types trends).

The DID approach, indeed, consists of identifying a specific intervention or event (a shock) – in our case the change of the coalition in charge occurred at the beginning of 2001 – for the purpose of comparing the difference in outcomes – after and before the intervention – between the treatment group (in our case the self-employed, craftsmen and dealers, i.e. those that could change their fiscal behaviour according to the ruling coalition) and the control group (in our case the private employees, whose attitude to pay taxes cannot be directly affected by the political cycle).

The DID methodology requires that two assumptions have to be verified: first, individuals should have to be grouped by an exogenous variable, so overcoming the endogeneity issues; second, the trend of the outcome variable for the control and treatment groups should have been the same in absence of the shock (the so-called common trend hypothesis). Both assumptions are verified in our paper.

As regards the first assumption, as said, we carry out our main estimates only considering the sub-sample of those never moving between employment and self-employment in the 1996-2005 period. The second assumption is difficult to be tested. However, looking at the trend of mean self-employed and private employees annual gross earnings (in nominal prices; Figure 2), a similar trend before the 2001 shock emerges, thus plausibly verifying the common trend hypothesis.

Figure 2: Trend of mean gross yearly earnings (nominal prices) 1996-2005



Source: elaborations on AD-SILC data

Looking at mean annual earnings, a widening gap between private employees and both types of self-employed emerges since 2001, thus providing a first descriptive evidence of the reduction of relative reported labour incomes of self-employed when the centre-right coalition ruled. The aim of this paper is testing whether this reduction persists when individual characteristics and time trends (both common trends or specific trends for private employees and self-employed) are taken into account, so to identify a pure effect due to the Government change. Hence, controlling for these characteristics and detailed time trends, this effect can be interpreted as a pure effect of the Government change on self-employed reported income, i.e. as an indirect proxy of their propensity to tax evasion. In other terms, if the effect is negative a lower propensity to report income, then a higher propensity to evade, emerges, while the opposite holds if the estimated effect is positive.

The estimates of the variation of self-employed incomes due to the government turn-out could be plagued by omitted variable bias, due to the missed consideration of the business cycle. To this end in our estimates we include annual real GDP growth rates and regional unemployment

rates and two types of time trends: i) a common trend (expressed through the year dummies), that allows to control for general trends jointly affecting both employees and self-employed; ii) specific time trends for self-employed and employees (got interacting year dummies and the worker's category), in order to control for specific time trends affecting a single category, e.g. the effect of the economic cycle on a single category – as the introduction of the Euro in 2002 that mostly advantaged the price makers, as craftsmen and dealers.

As already noted, coalition changes could affect “propensity” to correctly report labour incomes (i.e. their tax compliance) through two channels: i) affecting, through actual or expected measures, the standard determinants of tax evasion identified by Allingham and Sandmo (1972), i.e. audit frequency, penalty sizes, tax rates; ii) affecting the tax morale (Kirchler 2007), influencing individual social norms about the tax system and the individual perceptions on the opportunities to underreport incomes to fiscal authorities; for instance, policy makers statements minimizing the negative values associated to tax evasion or the introduction of repeated tax amnesty could reduce tax morale. Therefore, controlling for a common trend does not allow to distinguish between the two aforementioned channels, while controlling for specific time trends could allow to deurate the estimates from the impact of specific policy measures on a single category (e.g. measures advantaging self-employed only), thus allowing to better disentangle the “tax morale” impact of the government turn-out on self-employed reported incomes.

Therefore, carrying out individual fixed effects panel estimates, we compute the treatment effect comparing the treated units before and after the political turn out (i.e. distinguishing the two five-year periods 1996-2000 and 2001-2006)

$$(1) \quad \ln w_{it} = \alpha + \beta \text{treat}_{it} + \delta \text{after}_{it} + \gamma \text{treat}_{it} * \text{after}_{it} + \mu C_{it} + \vartheta \text{year} + \phi P + \varepsilon_{it}$$

where  $i$  and  $t$  are respectively the individual and the year (from 1996 to 2005), the dependent variable ( $w$ ) is the log of annual gross labour incomes, the treatment group ( $\text{treat}$ ) is a dummy variable equal to 1 for self-employed, 0 for private employees, “after” is a dummy variable equal to 1 if the observation is in the period after the shock (i.e. in the period 2001-2005) and the coefficient  $\gamma$  of the interaction term  $\text{treat} * \text{after}$  is our key coefficient, as it expresses the change in self-employment earnings when the centre-right coalitions went to rule. Therefore, the coefficient  $\gamma$  measures the effect of the political cycle (i.e. the shock) on the earnings of the treated group.  $C_{it}$  is a set of individual time varying controls,  $P$  is a vector of macro variables proxying business cycle (real GDP growth and regional unemployment rate) and “year” is the time dummy (also interacted with workers' categories in our saturated preferred model).

Indeed, as said, we carry out two specifications, that differ by the type of time trend included and the two models are run both pooling together the two self-employed groups and distinguishing craftsmen and dealers (in that case we have two different categories of treated individuals, whose incomes are compared to those of employees).

The second part of our analysis aims to verify if the behaviour of taxpayers, within the treatment group, changes along the income distribution. This investigation is carried out using the methodology proposed by Canay (2011) for the estimation of quantile regressions for panel data

The standard model of quantile regression, introduced by Koenker and Bassett (1978), does not take into account the unobserved fixed effects. The new model proposed by Canay (2011),

instead, allows to clear the role played by unobserved individual heterogeneity – on the assumption that the unobserved fixed effect are location shift variables – that can bias the cross-sectional estimates. Furthermore, the new model, allows to control for some time invariant unobserved covariates by the inclusion of individual fixed effects in the model specification.

Using the longitudinal component of the panel data, the individual fixed effect can be eliminated by a simple transformation of the data. This transformation is implemented by a two-step estimator, which is consistent and asymptotically normal when both the observed individual and the time period go to infinity.

The model is represented as follow:

$$(2) \quad Y_{it} = X'_{it}\theta(U_{it}) + \alpha_i$$

where  $i$  and  $t$  are respectively the observed individual and the time period;  $Y_{it}$  is the outcome variable;  $X'_{it}$  is the vector of covariates and is assumed to include a constant term;  $U_{it}$  is a random variable aggregating all unobserved factors and represents the disturbance, while  $\alpha_i$  are the fixed effects – not included in  $U_{it}$  – and represents the unobserved individual heterogeneity.

Defining  $\tau \in (0,1)$  the quintile of interest then  $\tau$ ,  $\theta(\tau)$  shows the quantile specific effects – our parameter of interest – and can be estimated by quantile regression.

The identification of the model is based on the following assumptions<sup>13</sup>:

- $\alpha_i$  does not change across quantiles as  $\alpha_i$  is independent of  $U$ ;
- the model excludes characteristic functions that vanish on non-empty open subsets, but allows the characteristic function to have countably many zeros;
- the standard assumption for quantile regression models are extended to the panel case;
- $\theta_\mu = E[\theta(U_{it})]$  exists;
- the standard rank-type condition – on the subvector of regressors that excludes the constant term and implies that  $\theta_\mu$  is identified – is assumed.

Under all these assumptions the location  $\theta_\mu$  is identified and the parameter of interest  $\theta(\tau)$  is *point* identified from the distribution of the observed data.

Finally, we describe the transformation by a two-step estimator. In the first step a consistent estimator of fixed effects  $\alpha_i$  – the unobserved individual fixed effects – is estimated following equation 3.

$$(3) \quad \hat{\alpha}_i \equiv E_T[Y_{it} - X'_{it} \hat{\theta}_\mu]$$

where  $\hat{\theta}_\mu$  is a  $\sqrt{nT}$  consistent estimator of  $\theta_\mu$ ; in this phase we are assuming that to affect all units in the same way regardless of quantiles and so, the fixed effects can be estimated at the conditional mean. In the second step the predicted fixed effect are deducted from the dependent variable in order to control for unobserved individual heterogeneity as shown in equation 4:

$$(4) \quad \hat{Y}_{it} \equiv Y_{it} - \hat{\alpha}_i$$

<sup>13</sup> For more details see Canay (2011).

and we define the two-step estimator of  $\hat{\theta}_\mu$  as:  $\hat{\theta}_\mu \equiv \arg \min_{\theta \in \Theta} E_{nT}[\rho_\tau(\widehat{Y}_{it} - X'_{it}\theta)]$ . At the end the computed values for the dependent variable, net of fixed effects, are regressed on other covariates following the traditional quantile regressions.

## 6. Results

### 6.1 Panel estimates

We start carrying out pooled OLS, random and fixed effects estimates on the full sample (i.e. including also individual moving across workers' categories in the 10 years period), including the common trend (i.e. year dummies are not interacted with workers' categories). Independently on the estimated model, the estimated coefficients confirm the descriptive results shown in section 4: self-employed earnings (and dealers and craftsmen earnings when these two categories are distinguished) significantly reduced in the five-year period 2001-2005, i.e. when the Centre-Right coalition led by Silvio Berlusconi was on charge of the Government and the size of the decrease enlarges when panel estimates are carried out and it is very similar in fixed effect and random effect models (Table 5)<sup>14</sup>: on average, self-employed earnings reduced by around 6.5-7.9% when fixed or random effects estimates are carried out and the decrease is higher for craftsmen than for dealers.

Table 5: Estimated coefficient  $\gamma$  of the interaction between the self-employed dummy and the post-shock dummy<sup>1</sup>

	<i>Pooled OLS</i>	<i>Fixed effect</i>	<i>Random effect</i>
Self-emp.*post shock	-0.0410	-0.0741	-0.0699
<i>S.E.</i>	<i>0.0074</i>	<i>0.0073</i>	<i>0.0071</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>
Craftsman.*post shock	-0.0462	-0.0788	-0.0743
<i>S.E.</i>	<i>0.0092</i>	<i>0.0092</i>	<i>0.0091</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>
Dealer*post shock	-0.0365	-0.0686	-0.0650
<i>S.E.</i>	<i>0.0102</i>	<i>0.0102</i>	<i>0.0099</i>
<i>P value</i>	<i>0.0004</i>	<i>0.0000</i>	<i>0.0000</i>
Number of obs.	125,944	125,944	125,944

<sup>1</sup>Control variables are: dummies for workers' categories, age, age squared, experience, gender, education, region of work, regional unemployment rate, real GDP growth rate and time dummies.

Source: elaborations on AD-SILC data

<sup>14</sup> Detailed results of the regressions presented in section 6 are available upon request.

According to the results of a Hausman test<sup>15</sup> we prefer to rely on the fixed effect model only and we carry out several robustness checks (Table 6). In the second column we take into account only the subsample of individuals not moving across the different working categories in the 10 years period (thus the estimate cannot be plagued by endogeneity due to individual self-selection in private employment or self-employment, see section 4) and the results confirm that, on average, self-employed earnings significantly reduced by 6.9% compared to employees ones. The same effect is confirmed when considering a balanced sub-sample (only individuals present in the sample for the whole observation period; column 3), even if the size of the effect slightly decreases.

Table 6: Estimated coefficient  $\gamma$ . Fixed effect model on the subsample of those not moving across working categories in the observed period<sup>1</sup>

	<i>No movers - baseline</i>	<i>Balanced sub- sample<sup>2</sup></i>	<i>No election years<sup>3</sup></i>	<i>Regression on gross weekly wages</i>
Self-emp.*post shock	-0.0686	-0.0557	-0.0838	-0.0379
<i>S.E.</i>	<i>0.0075</i>	<i>0.0079</i>	<i>0.0083</i>	<i>0.0062</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>
Craftsman.*post shock	-0.0741	-0.0603	-0.0943	-0.0418
<i>S.E.</i>	<i>0.0096</i>	<i>0.0102</i>	<i>0.0106</i>	<i>0.0082</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>
Dealer*post shock	-0.0613	-0.0498	-0.0706	-0.0325
<i>S.E.</i>	<i>0.0104</i>	<i>0.0111</i>	<i>0.0116</i>	<i>0.0087</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0002</i>
Number of obs.	115,955	64,760	92,931	115,509

<sup>1</sup> Control variables are: dummies for workers' categories, age, age squared, experience, gender, education, region of work, regional unemployment rate, real GDP growth rate and time dummies. <sup>2</sup> Only individuals that do not move across working categories and are present in the panel as private employees, craftsmen or dealers for the whole observation period are taken into account. <sup>3</sup> The two election years (1996 and 2001) are not taken into account.

Source: elaborations on AD-SILC data

In the last two columns, we run the model, excluding from the analysis the election years 1996 and 2001 (column 4) and as dependent variable the gross weekly wages (column 5). Interestingly, when the election years are not considered the effect become still clearer, while, as expected, when considering weekly wages (then depurating the dependent variable from employment effects in a year) the size of the effect reduces, but it is still largely significant.

Finally, in order to control for additional sources of heterogeneity between private employees and self-employed, we run our favourite "full model", when the interaction dummies between workers' categories and year dummies are included (Table 7).

<sup>15</sup> The choice between random and fixed effect is carried out computing a Hausman test ( $T=200.04$ ;  $p\text{-value}=0.000$ ) that suggests to reject null hypothesis and to use fixed effect model.

When including in the estimates specific time trends for self-employed and private employees, the size of the “political cycle effect” enlarges and the estimated decrease of self-employed reported incomes in the period 2001-2006 – that, as said, can be interpreted as the pure effect of the coalition in charge on the attitudes towards correctly reporting incomes – amounts to 12.6% in the baseline model of column 2. This result is confirmed when also the interactions between time dummies and the region of work are included among the regression, when only individuals working for the whole period are considered and when the two election years are not taken into account (column 3, 4 and 5, respectively). Differently, the size of the effect largely decrease (but it is still significantly different from zero) when weekly wages are considered as the dependent variable (this could be due to specific time trends affecting working weeks of private employees after the deregulation of fixed term employment relationship introduced in Italy in 2001)

Table 7: Estimated coefficient  $\gamma$ . Specific trends models<sup>1</sup>. Fixed effects models on the subsample of those not moving across working categories in the observed period<sup>2</sup>

	<i>Full model</i>	<i>Without regional trends<sup>3</sup></i>	<i>Balanced sub-sample<sup>4</sup></i>	<i>No election years<sup>5</sup></i>	<i>Regression on gross weekly wages</i>
Self-emp.*post shock	-0.1260	-0.1255	-0.1085	-0.1389	-0.0310
<i>S.E.</i>	<i>0.0143</i>	<i>0.0143</i>	<i>0.0147</i>	<i>0.0138</i>	<i>0.0109</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0046</i>
Craftsman.*post shock	-0.1146	-0.1153	-0.1091	-0.0836	-0.0334
<i>S.E.</i>	<i>0.0183</i>	<i>0.0183</i>	<i>0.0189</i>	<i>0.0138</i>	<i>0.0144</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0208</i>
Dealer*post shock	-0.1381	-0.1358	-0.0545	-0.0334	-0.0269
<i>S.E.</i>	<i>0.0198</i>	<i>0.0197</i>	<i>0.0171</i>	<i>0.0160</i>	<i>0.0150</i>
<i>P value</i>	<i>0.0000</i>	<i>0.0000</i>	<i>0.0015</i>	<i>0.0373</i>	<i>0.0735</i>
Number of obs.	115,955	115,955	64,760	92,931	115,509

<sup>1</sup> Interaction dummies between time dummies and workers’ categories and time dummies and region of work are included in all models. <sup>2</sup> Control variables are: dummies for workers’ categories, age, age squared, experience, gender, education, region of work, regional unemployment rate, real GDP growth rate and time dummies. <sup>3</sup> Interaction dummies between time dummies and region of work are not included among covariates. <sup>4</sup> Only individuals that do not move across working categories and are present in the panel as private employees, craftsmen or dealers for the whole observation period are taken into account. <sup>5</sup> The two election years (1996 and 2001) are not taken into account.

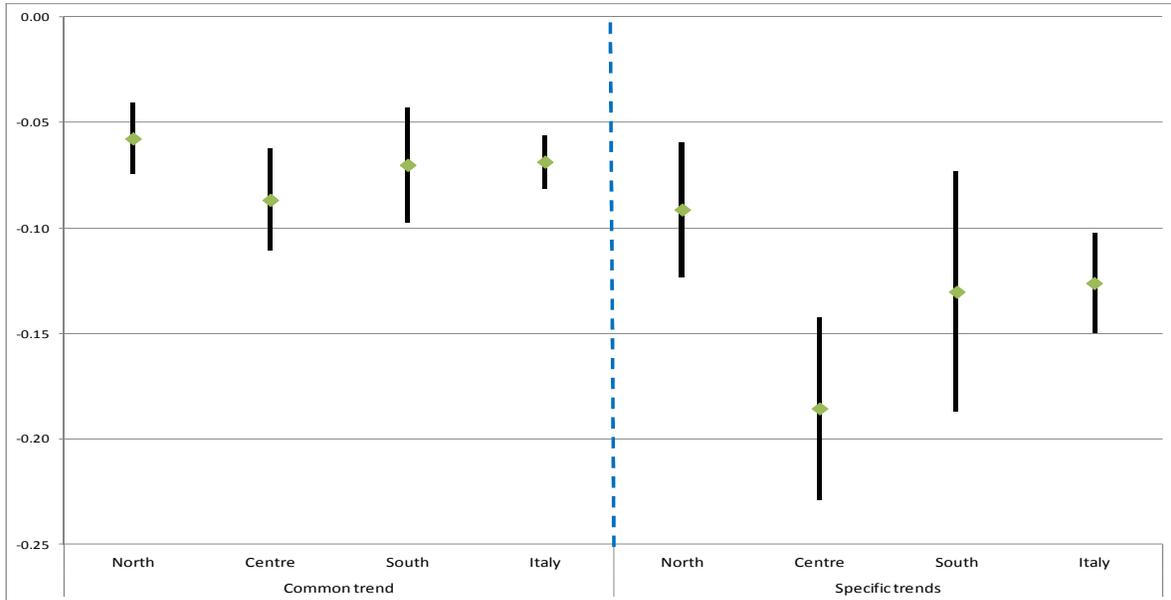
Source: elaborations on AD-SILC data

Summarizing, interpreting this evidence as a proxy of an influence of the political cycle on the attitudes of self-employed to underreport their income, we can argue that moving from a centre-left to a centre-right government coalition significantly affected self-employed tax compliance in Italy, reducing their reported income by 12.6% and this holds for both craftsmen and dealers.

Distinguishing workers according to the geographical area when they work (North, Centre and South; Figure 3), a higher effect of the government turn-out on self-employed propensity to underreport their income emerges in the Centre, and this holds for both the common trend and the specific trend models. Finally, the “decreasing reported income” effect is greater for males

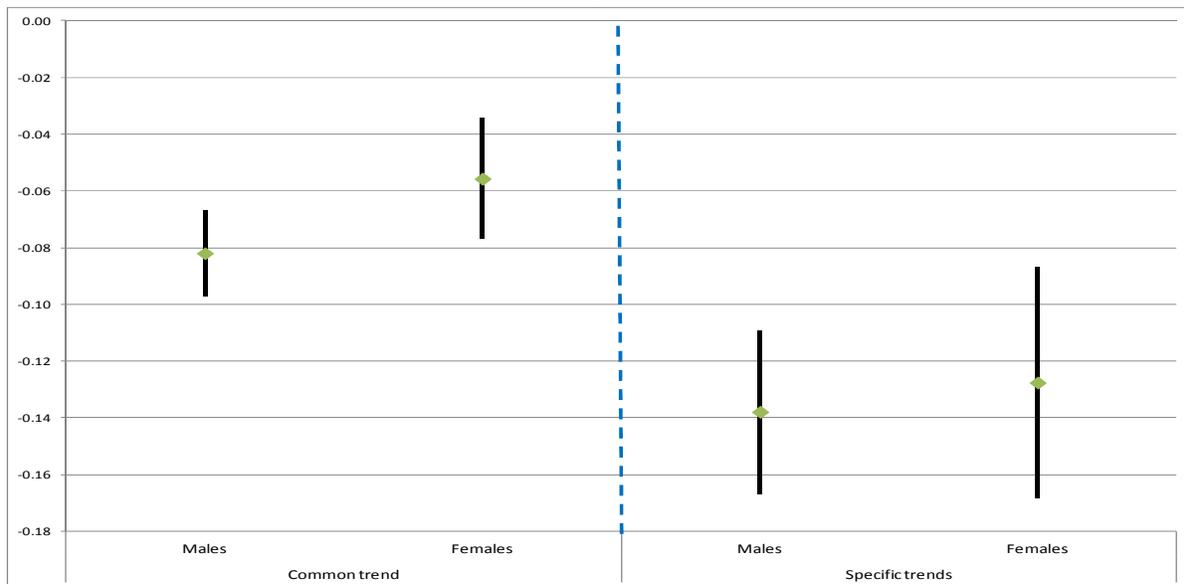
than for females in both the model specifications, but the distances are low in the specific trend model (Figure 4).

Figure 3: Estimated coefficient  $\gamma$  by geographical area of work (90% interval of confidence)<sup>1</sup>.



<sup>1</sup> Control variables in the “Common trend model” are: dummies for workers’ categories, age, age squared, experience, gender, education, region of work, regional unemployment rate, real GDP growth rate and time dummies. In the “Specific trends model” interaction dummies between time dummies and workers’ categories and time dummies and region of work are added. Individuals moving across working categories in the observed period are not take into account. Source: elaborations on AD-SILC data

Figure 4: Estimated coefficient  $\gamma$  by gender (90% interval of confidence)<sup>1</sup>.



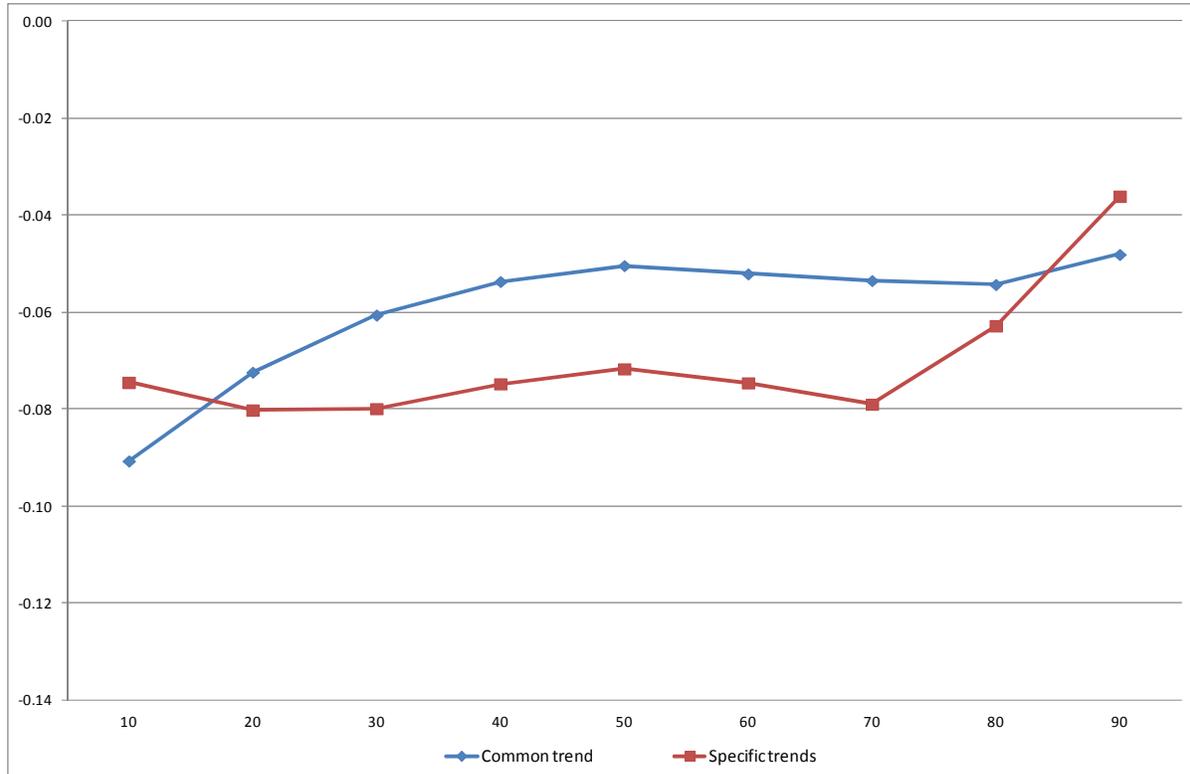
<sup>1</sup> Control variables in the “Common trend model” are: dummies for workers’ categories, age, age squared, experience, gender, education, region of work, regional unemployment rate, real GDP growth rate and time dummies. In the “Specific trends model” interaction dummies between time dummies and workers’ categories and time dummies and region of work are added. Individuals moving across working categories in the observed period are not take into account. Source: elaborations on AD-SILC data

## 6.2 Quantile fixed effects estimates

As a final exercise we run quantile fixed effects estimates following the procedure of Canay (2011) explained in section 5 in order to verify how the coefficients of the interaction terms between self-employed and the post shock dummy move along the distribution (Figure 5).

The estimated coefficients are negative and significant in all deciles, but their size reduces along the distribution, especially up to the median.

Figure 5: Estimated coefficients  $\gamma$  in quantile fixed effects models<sup>1</sup>.



<sup>1</sup> Control variables in the “Common trend model” are: dummies for workers’ categories, age, age squared, experience, gender, education, region of work, regional unemployment rate, real GDP growth rate and time dummies. In the “Specific trends model” interaction dummies between time dummies and workers’ categories and time dummies and region of work are added. Individuals moving across working categories in the observed period are not take into account.

Source: elaborations on AD-SILC data

## 7. Conclusions

Using a new panel dataset that allows to follow individuals along their entire working career, and following a difference-in-difference approach, where the employees are the control group and craftsmen and dealers (the typologies of self-employed tracked in our dataset) are the treatment group, in this paper we tested whether self-employed incomes significantly reduced, compared to private employees earnings, after the government turn-out that occurred in Italy in 2001 when a centre-right government replaced a centre-left one. Indeed, we argued that, *ceteris paribus*, the

political cycle could have affected self-employed attitudes towards correctly reporting their labour incomes, because the two coalitions that were alternatively in charge of the Government in Italy in the decade 1996-2005 showed different attitudes towards self-employed.

Consistently with our expectations, we find that (compared to employees) self-employed earnings significantly reduced during the centre-right wing government (2001-2005) and a significant decrease emerges in all deciles, even if it is a bit larger in bottom deciles and the size of the estimated effect enlarged when specific time trends for employees and self-employed are considered.

Therefore, interpreting this evidence as a proxy of an influence of the political cycle on the attitudes of self-employed to underreport their income, we can argue that moving from a centre-left government to the centre-right coalition led by Silvio Berlusconi significantly affected self-employed tax compliance and tax morale.

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