The direct and indirect effect of tax audits on compliance

1) The starting point: the credibility revolution in tax evasion studies

Empirical research about tax evasion and the informal economy has exploded in the past few decades, seeking to shed light on the magnitude and (especially policy) determinants of these phenomena. Quantitative information informs the analysis of policy choices, enables testing hypotheses about determinants of this phenomenon, and can help constructing accurate national income accounts. Despite the burgeoning empirical literature in this field, however, some scholars have expressed doubts about the quality and usefulness of some well-established measures of tax evasion. The fact that high-quality data on tax evasion is elusive is not surprising. The defining characteristic of tax evasion and informal economic activity itself — namely their illegality — often renders unreliable standard data collection methods such as surveys. Unlike invisible phenomena in the natural sciences, these invisible social science phenomena are hard to measure because of choices made by individuals. Then, analysis of tax evasion and the informal economy must proceed even in the absence of the direct observability of key variables, and theory should guide the construction and interpretation of evidence of the "invisible." These are the essential elements of the *credibility revolution* which, according to Slemrod and Webber (2012), is needed (also) in the field of tax evasion and tax compliance studies.

2) Aim of this research and data

This project aims to contribute to the *credibility revolution* by focusing on some selected issues in tax compliance. The project is the result of an ongoing partnership between DEMS (Department of Economics, Management and Statistics of University of Milano Bicocca) and the Italian Revenue Agency (Agenzia delle Entrate, IRA from now on). This partnership is based on the 'data in exchange of know-how' principle. Basically, the IRA allows DEMS, and in particular the proponent of this research, to use IRA microdata to conduct research activity aiming at: i) producing research reports to be used exclusively by the IRA for the purpose of improving policy design and policy evaluations; ii) produce high-quality research to be published (upon authorization by the IRA) on academic journals.

The partnership started off in an informal way in 2010 and it was focused on analysing: i) the impact of the Italian business sector studies (*studi di settore*, see Santoro and Fiorio, 2011) ii) the impact of letters announcing 'suspected' taxpayers of a conditionally higher probability to be audited (see Fiorio, Iacus and Santoro, 2013).

The agreement between the IRA and DEMS includes the following objectives:
i) analysis of the impact of ordinary audit policies;
ii) analysis of the role of tax consultants;
iii) measurement of aggregate tax evasion.

This research is devoted to objectives i) and ii). Our first aim is to estimate what is the impact of an audit, i.e. a tax control conducted on a taxpayer, on his compliance, i.e. on his tendency to truthfully report incomes in the years following the audit. This is known in the literature as the *direct* effect of a tax audit. Our second aim is to contribute to the literature on the *indirect* effect of a tax audit, i.e. to the impact that audit conducted on taxpayer i has on taxpayer j who is, for some reason, connected to taxpayer j.

The database has been provided by the IRA to DEMS in the second half of 2014. Since then, a number of quality checks and data analysis have been performed. DEMS has just received

the last release of the database. The database consists of a panel of the entire population of single entrepreneurs and self-employed workers acting in three major Italian regions (i.e. Lombardy, Lazio and Sicily, that account for more than one third of the overall Italian population) and covers the tax periods from 2006 until 2011 included.

The panel includes, for every observation:

i) Demographic information: gender, age, province and city of residence

ii) Variables from tax declarations: income reported, revenues, costs tax allowances, tax credits for IRPEF purposes; turnover, deductible costs foreign sales and purchases for VAT purposes; revenues and costs for IRAP purposes

iii) Variables from social contribution declarations: contributions paid by the taxpayer for himself or to the advantage of his workers

iv) Business-related variables: years in business, sector of operation, number of dependent workers, amount of salaries paid, days of work

v) Variables identifying the tax intermediary or tax consultant who has transmitted or has filled in (under his own legal responsibility) the tax declaration

vi) Information on the presumptive turnover attributed by the IRA to the taxpayer (and known to the latter) through the method known as *Studi di settore*

vii) Information on audit activities: occurrence of an audit (of two types: *accertamento or verifica*), year of the audit, outcome of the audit (*maggiore imposta accertata*), and outcome of the procedure started after the audit (payment, settlement or trial)

The exceptionality of this database relies primarily on the availability of microdata on audit activities. More specifically, it must be noted that there is always a time lag between the tax year to which the audit is referred and the year when the audit is actually accomplished. In the tax jargon, tax declarations referring to year t are 'auditable' for t+n years; in Italy, n=5. Therefore, the panel structure is necessary to evaluate the tax behaviour by the audited taxpayer, and to compare it to that held by the (comparable) non-audited taxpayer. The data provided by IRA allows us to observe the entire set of audits accomplished on tax declarations for tax years 2006 and 2007, since audits referring to tax year 2006 are accomplished between 2008 and 2011 while audits referring to tax year 2007 are accomplished between 2009 and 2012.

3) Theory

In the Allingham-Sandmo model, the probability to be audited is assumed to be fixed and not dependent on income. This is consistent with the idea of random audits, where, for every tax year, taxpayers to be audited are selected regardless of their personal features (income reported in that and in previous years, audits and outcomes of their audits conducted in previous years, etc.). If audits were random, and known to be random by taxpayers, then no effect should be expected, since the rational taxpayers should perceive audits as a lottery. However, in the real world no Revenue Agency uses (exclusively) random audits.
Rule-based audits can be of different types, according to the information set available to the Revenue Agency and to its objectives. In general, audit activities are focused on taxpayers who are not (entirely) subject to some kind of third-party reporting: self-employed,

entrepreneurs and, in general, taxpayers reporting some income from business activity. If the taxpayer perceives that s/he has been (not) audited in application of a rule which is a function of personal features (sector of operation, region, gender, age, etc.), then a *target effect* may arise, so that audited taxpayers *coeteris paribus* should evade less than those who are not audited. On the other hand, if the taxpayer believes that he has been audited since his income is below a given cut-off, he may react to the audit by increasing his reported income, although not necessarily decreasing his tax evasion, in the years following the audit. However, the experimental literature has identified the so-called '*bomb-crater*' effect, which is based on the idea that an audited taxpayer may believe that the probability of being audited again in the future is low. In such a case, evasion may increase (income may decrease) as a consequence of the audit.

4) Empirical approach

The main problem we have to face is that audited taxpayers are not randomly selected, but rather chosen on the basis of a 'risk assessment' activity conducted internally by the Revenue Agency (so the risk assessment is the rule used to select taxpayers). We will be able to obtain from the Revenue Agency the variables relevant for this assessment activity. This information will allow us to define risk profiles and to match, accordingly, audited (i.e 'treated') and non-audited ('non-treated') taxpayers within every risk profile. Audited and non-audited taxpayers with the same risk profile can be compared according to the change in their tax behaviour (to be measured by the appropriate outcome variable) in any year following the audit with respect to the previous ones (especially, but not exclusively, the one to which the audit refers). Considering audits conducted in 2007, this strategy would fit a classical difference-in-difference approach (DD), using year 2006 to check the parallel trend assumption. A possible refinement would be to control for the type of audit, which can influence the number of backward tax periods to which the audit refers. Moreover, we can distinguish taxpayers audited in 2006 from those audited in 2007 (ignoring those, if any, who have been audited in both years), to have a third dimension and implement a triple difference (DDD) approach. However, in such case we could not verify the parallel trend assumption for taxpayers audited and not audited in 2006.

This approach can be used to estimate the *direct* effect of audits as well as an (particular kind of) *indirect* one. More specifically, the effect of an audit conducted on taxpayer *i* can be transmitted to taxpayer *j* through their (common) tax consultant. Thus, we could compare the tax behaviour of all taxpayers who are served by a consultant who has at least one audited taxpayer among his customers to that of taxpayers who are served by a consultant who has no audited taxpayers among his customers.

As regards the choice of the outcome variable, the main problem is that evasion cannot be observed. A potential outcome is then the change in income reported, which is also interesting since income can be perceived by the taxpayer (quite independently of that being or not *actually* included in the risk profile built by the Revenue Agency) as the variable on which the audit rule is based. However, since our dataset contains information on presumptive turnover for a subset of taxpayers, we can also calculate a proxy of the level of tax evasion by taking the difference between reported and presumptive turnover and use it as outcome variable.

As a final point, note that we are able to control for all the variables which, according to the existing literature, influence the propensity to evade or the tax morale, such as gender, age, sector, region.

5) Expected results

Given the exceptionality of the database we possess, we believe that we will be able to obtain innovative results in the tax evasion field and to provide for the first time robust empirical evidence regarding i) the causal effect of audit activity on tax evasion; ii) the effect of being served by a tax consultant with audited customers on tax evasion of other taxpayers ("network effect"). More specifically, the questions we will try to answer are: i) do audited taxpayers, *coeteris paribus*, evade more or less as compared to not audited taxpayers? ii) do taxpayers who are served by a tax consultant who has an audited taxpayer among his customers evade more or less as compared to taxpayers who are served by a tax consultant who has no audited taxpayers among his customers? The relevance of these questions, both for theoretical and for policy-oriented research, and the strong empirical strategy that we can implement with the unique dataset provided by IRE, is such that we believe the outcome of this research can be targeted to highly ranked academic journals.

6) Research Team

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The team works in close connection with Italian Revenue Agency, and, in particular, with the Direction for statistic and econometric studies to enhance tax compliance directed by Stefano Pisani

(http://www.agenziaentrate.gov.it/wps/file/Nsilib/Nsi/Agenzia/Chi+siamo/Organigramma+centrale/DC+AMMPC/Organigramma+dc+ammpc.pdf).