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TAX MORALE AND PUBLIC SPENDING INEFFICIENCY

by Guglielmo Barone* and Sauro Mocetti*

Abstract

Tax evasion is a widespread phenomenon and encouraging tax compliance is an important and much debated policy issue. Many studies have shown that tax cheating has to be attributed to a considerable extent to the tax morale of taxpayers. The aim of the present paper is to shed light on the relationship between the taxpayer and the public sector. Specifically, we investigate whether public spending inefficiency shapes individual tax morale. Combining data from Italian municipalities' balance sheets with individual data from a properly designed survey on tax morale, we find that the attitude towards paying taxes is better when resources are spent more efficiently. This does not appear to be due to some confounding factors at the municipality level or to spatial sorting of citizens. It is also robust to alternative measures of both inefficiency and tax morale.

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1   Introduction[1]

Tax evasion is a pervasive and widespread phenomenon that entails important economic and social consequences. It reduces public revenues with effects in terms of the balance sheet. Moreover, it creates horizontal inequity because equally well-off people end up with different tax burdens; this, in turn, distorts the redistributive effect of taxation and undermines social cohesion. Therefore, understanding the main determinants of tax compliance is a major economic and political issue. According to a consolidated view, taxpayers decide whether and how much to evade taxes in the same way they would approach any risky decision or gamble (Allingham and Sandmo, 1972). However, as stressed by a large tide of recent research, the expected penalization is unsatisfactory in explaining the tax evasion evidence, and the paradigm of a rational and selfish agent appears to be inadequate (Andreoni et al., 1998; Slemrod, 2007). To solve the puzzle, several economists emphasize the role of tax morale – defined as the individual intrinsic motivation to comply with fiscal obligations – in explaining tax evasion.

The aim of the present paper is to shed further light on the determinants of tax morale by investigating the role of public sector and, in particular, of its inefficiency in providing public goods. We do so by exploiting the heterogeneity of public spending inefficiency across Italian municipalities. Namely, we examine whether taxpayers living in municipalities where public spending is highly inefficient show lower tax morale. Our measure of public spending inefficiency is based on a stochastic frontier model using information on expenditures and various output indicators for a panel of Italian municipalities. Individual tax morale is calculated by combining through a principal component analysis a variety of information on public spirit and taxation taken from a special section of the 2004 Survey of Households Income and Wealth (SHIW hereafter) carried out by the Bank of Italy.

We focus on tax morale rather than tax compliance for two main reasons. The first is more practical since it is very difficult (almost impossible) to observe tax compliance at the individual level whereas tax morale can be measured through properly designed surveys. The second refers to the interpretation of the potential findings: if we were able to estimate the effect of state efficiency on individual tax compliance, we would not know exactly how it occurred. It could have derived from a more cooperative behaviour of the taxpayers (because of the fairness of the fiscal exchange) but also from coercive policies – the more the state is efficient the more it is capable of auditing the taxpayers and, more generally, of applying rules and checking their effectiveness. Therefore, looking

at tax morale is a better way of identifying the impact of institutions on individual attitudes and preferences.

Our empirical findings indicate that public spending inefficiency does negatively affect citizens' tax morale. This evidence does not seem to be driven by some confounding factor at the municipality level or by spatial sorting of citizens and proves robust to accounting for alternative measures of both inefficiency and tax morale. This is an expected result since the efficient behavior of the public sector in the provision of public goods can stimulate a "cooperative" reaction of the taxpayer in the form of a better attitude towards her fiscal duties. For example, in the taxpayer's cost-benefit calculation public spending inefficiency is equivalent to a waste of resources and implies a less favorable ratio between the supply of public goods and the taxes used to finance them. Consequently, the taxpayer may react with a lower propensity to pay taxes because of the unfairness of the fiscal exchange.[2] At the same time, ethical and social norms influence individual beliefs and behaviors: if there exists a "stigma" associated with tax evasion then an inefficient public sector may lower the psychological cost of cheating in terms of guilt, bad conscience, or bad reputation.[3]

We also find that the negative effect of inefficiency is larger if the level of public spending is lower and/or the degree of fiscal autonomy is higher. A possible interpretation of former additional result is that a lower level of public spending may generate resentment in the taxpayers who become more sensitive to how resources are spent. A larger autonomy of local authorities, in turn, increases the proximity between the taxpayer and the public sector so that citizens attach more responsibilities to municipalities and are more responsive to their spending efficiency.

A growing number of papers have recently focused on the determinants of tax morale. Most of the literature analyzes how individual socioeconomic characteristics affect tax morale, whereas the evidence on the role of institutions is scant. Friedman et al. (2000), in a cross-country analysis, show that countries with more corruption and onerous bureaucracies have a larger share of unofficial economy. However, drawing conclusions from cross-country comparisons is difficult because institutional and cultural frameworks that typify specific countries might influence both the quality of institutions and the degree of tax morale and they cannot always be controlled for in a satisfactory manner.

Many papers use microdata, mainly taken from the World Value Survey. Slemrod (2002) finds a negative correlation between the acceptability of tax evasion and confidence and trust in government. Alm and Torgler (2006) highlight the role of trust in both the legal system and parliament as affecting tax

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[2] Alm et al. (1992a, 1992b) found in laboratory experiments that tax compliance is greater when individuals perceive some benefits for their taxes. This relationship arises even when there is no chance of detection and punishment. See also Bordignon (1993) for a formal model on the relationship between governmental supply of public goods and the tax evasion decision.

[3] A number of studies since Elster (1989) have emphasized the role of social norms in explaining individual behavior.

morale, and Torgler (2005b) shows that trust in the president and his officials is positively associated with an individual's propensity to pay taxes. The main limitation of these papers is that they generally base their inference on cross-sectional individual data on both tax morale and trust in institutions. Therefore, the identification might be undermined by the potential presence of some individual-level omitted variable driving the observed correlation (e.g. the proclivity to respect the rules and the authority). Finally, some recent papers combine micro with aggregate data: Feld and Frey (2002) and Torgler (2005a) show that direct democratic rights have a significantly positive effect on tax morale. Güth et al. (2005) and Torgler and Werner (2005) analyze the relationship between fiscal autonomy and tax morale. Cannari and d'Alessio (2007) find that tax morale is negatively associated with province-level unemployment and crime rates and positively associated with social capital.

Our contribution to the existing literature is twofold. First, we extend previous research explicitly focusing on the relevant issue of the link between public spending inefficiency and tax morale. Second, we combine survey data on individual, subjective judgments about taxes with an objective measure of inefficiency at the municipality level, thus minimizing the risk of capturing a spurious correlation between the two variables of interest. Moreover, we think that Italy is a particularly interesting country to analyze. It performs poorly in terms of public sector efficiency: in an international comparison, it ranks 18th among 23 developed OECD countries (Afonso et al., 2005). Even more impressive, according to Schneider (2005), more than one-fourth of the official Italian GDP is hidden.

Our paper is also partially related to other studies aimed at measuring and explaining the efficiency of municipalities (De Borger and Kerstens, 1996; Balaguer-Coll et al., 2007; Afonso and Fernandes, 2006). With these studies we share the techniques used to compute our index of cost inefficiency; however, differently to most of this literature, we do not investigate the determinants of inefficiency as we are interested in its effect on tax morale.

This paper proceeds as follows. In Section 2, we describe the data and introduce our key variables. We show the results together with several robustness checks in Section 3. Section 4 concludes.

2   Data and variables

Our dataset is built by combining individual data on tax morale and socio-demographic characteristics from the SHIW with aggregate data on public expenditure and outputs taken from the balance sheets of Italian municipalities (NUTS5 in European terminology). In the following, we describe data sources and methodologies used to generate the two variables of main interest: tax morale and public spending inefficiency.

2.1 Tax morale

Tax morale is defined as the attitude towards paying taxes, and we are able to measure it thanks to a properly designed survey conducted by the Bank of Italy.[4] The 2004 issue of the SHIW contains an original section where a number of opinions regarding public spirit and taxation have been collected from a random sample of about half of the total sample of householders (3,798 observations). In the survey, there are a number of statements about the behavior of citizens and the respondents state, in an ordered scale, to what extent they agree with each of the statements.[5] Our indicator of tax morale is the first principal component of the following (correlated) six variables:[6]

(1) how much is justifiable "*not paying for your ticket on public transport*".

This variable, where the respondents' choice is made on a (1–10) scale with 1 being never justifiable and 10 being always justifiable, should capture the individual inclination to contribute to the provision of a local public good. The next four variables deal with the level of agreement of the respondents to a set of statements about Italy's tax system. These variables, where the respondents' choice is made on a (1–5) scale of with 1 being not at all and 5 being very much, are as follows:

(2) "*paying taxes is one of the basic duties of citizenship*";
(3) "*not paying taxes is one of the worst crimes a person can commit because it harms the whole community*";
(4) "*it is right not to pay taxes if you think they are unfair*";
(5) "*even if someone thinks a tax is unfair, he/she should pay it first and then complain if necessary*".

Variables (2) – (5) are likely to proxy an individual's inclination to comply with fiscal obligations. Finally, we included the respondent's opinion on

(6) "*it would be a good thing if tax inspections were made more often, or not*".

The rationale for the last item is that those who do not comply with fiscal duties are likely those who are more sensitive to an increase in the probability of being caught. Table 1 contains a description of each item included in the principal

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[4] The Bank of Italy conducts this survey every two years on a representative sample of approximately 8,000 households. See Brandolini and Cannari (1994) for details.
[5] These types of questions should increase the reliability of the measure of tax morale: since they do not directly ask whether a person has evaded taxes, we expect the degree of honesty to be higher.
[6] See also Cannari and D'Alessio (2007) and Fiorio and Zanardi (2006) for slightly different measures of tax morale based on the same data. In Section 3.4, we show that our findings are robust to different measurements of tax morale.

component analysis.

Our indicator of tax morale has two main advantages with respect to the existing literature. First, as usual in psychometric studies, it extracts information from various different dimensions of individual beliefs so it is a better measure of a multidimensional concept like tax morale. Second, in a multi-item index the random errors should tend to average out, thus producing a more reliable measure. The first principal component explains about 35 percent of the total variance of the underlying variables. In Table 2, we report some descriptive statistics. They show that tax morale is lower for those who belong to the lowest quartile of income distribution. Moreover, the propensity to pay taxes increases with education, and it is smaller for the self-employed than for employees. Finally, tax morale is lower in the South part of Italy.

2.2   Local public spending inefficiency

In this subsection, we estimate a measure of public spending inefficiency for Italian municipalities by using a stochastic frontier model (Aigner et al., 1977; Meeusen and van den Broek, 1977). We postulate the existence of a cost frontier that characterizes the minimum expenditure required to produce a specified bundle of public goods given a common technology available to all municipalities. This deterministic representation of the technology is augmented with a two-sided error term, composed of a traditional symmetric, random-noise component and a skewed and nonnegative inefficiency component. The former represents the effects of random variation in the data generating process in the spirit of the traditional least-squares-based approach while the latter captures the inefficiency of the production process that is the excess of expenditures a municipality sustains to deliver a certain bundle of public goods. The estimation of a stochastic frontier requires the choice of an explicit functional form for the cost function. Since the shape of this function is unknown, we choose a highly flexible translog-type specification. Thus, our model can be written as follows:

$$\ln C_{mt} = \alpha_0 + \sum_{i=1}^{n} \alpha_i \ln q_{imt} + \sum_{i=1}^{n} \sum_{j=1}^{n} \alpha_{ij} \ln q_{imt} \ln q_{jmt} + \lambda_t + \eta_{r(m)} + \mu_m + \varepsilon_{mt}$$

where $\ln C_{mt}$ is the natural logarithm of the total current cost that municipality m bore in year t to provide public goods q_i; λ_t are year fixed effects, and $\eta_{r(m)}$ are fixed effects at the level of the region r where municipality m is located.[7]

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[7] In Italy, there are more than 8,000 municipalities and 20 regions. The introduction of regional-fixed effects helps us to control for any idiosyncratic region-level factors affecting total cost, including the unobserved quality of public goods. In fact, we are confident that in the Italian context spatial heterogeneity in the quality of public goods is large between regions, but small within them. Note also that our specification does not include input prices since they are unavailable in the sample at our disposal. However, this is quite standard in literature and, again, the inclusion of region-level fixed effect can help in accounting for territorial variability of input prices.

In this model, deviations from the deterministic frontier are decomposed into a positive inefficiency effect, $\mu_m \overset{iid}{\sim} N^+\left(\mu, \sigma_\mu^2\right)$, and a usual error term, $\varepsilon_{mt} \overset{iid}{\sim} N\left(0, \sigma_e^2\right)$, where μ_m and ε_{mt} are distributed independently of each other and the covariates in the model. The assumption that cost inefficiency is time invariant seems reasonable given the small number of years considered and the strong degree of persistence of inefficiency across time. In this context, our measure of municipality-level public spending inefficiency (*PSI*) is given by $E\{\exp(\mu_m)|\varepsilon_{mt}\}$.[8]

Estimation is based on a unique dataset that contains measures of inputs and outputs taken from the balance sheets of Italian municipalities. These data include detailed measures of revenues and expenditures together with the outputs produced. Data are gathered by the Ministry of Internal Affairs and cover all years starting from 2001.[9] We restrict our attention to the 2001–2004 period because tax morale from the SHIW is measured in 2004, and we want inefficiency to be at least predetermined with respect to tax morale.

The selection of the *n* outputs is based on the minimum number of services that must be provided by each municipality. Specifically, local authorities are responsible for public street lighting, waste collection, nursery schools, surfacing of public roads, and a number of services related to the electoral list, vital statistics, national service, and so on. In Table 3, we present a full description of both inputs and outputs.

Our data have three main advantages with respect to the existing papers that measure inefficiency in municipalities. First, other studies measure municipalities' outputs with crude proxy variables such as population; on this point, our database allows us to define precise measures of outputs for each public good considered. Second, thanks to the panel dimension of the data, our measure is less sensitive to municipality-year idiosyncratic shocks or measurement errors that may undermine cross-section estimates. Third, the large amount of observations gives us the degree of freedom necessary to estimate a very flexible translog-type functional form instead of a more parsimonious but less flexible Cobb-Douglas. Thus, we can partially overcome the main disadvantage of a parametric approach, which is imposing a certain functional form to the technology.

Administrative data are not immune to imputation errors and other sources of noise. In order to clean the data, we check their internal consistency by computing the ratio between each input and the corresponding output, and then by trimming all the observations having values less than the first percentile and greater than the last percentile. We iterate this procedure for each item reported in

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[8] See Battese and Coelli (1992) for computational details.

[9] The current account standards of municipal balance sheets have been introduced at the end of the nineties, in order to better monitor local public spending in the frame of the internal stability pact. Each municipality must detail main categories of expenditures and revenues, according to standard models authorized by Ministry of Internal Affairs. They are available electronically since 2001. See http://finanzalocale.interno.it/sitophp/home_finloc.php?Titolo=Certificati+Consuntivi.

Table 3.[10] Because of missing data and dropped outliers, we are ultimately able to compute our inefficiency indicator for 1,458 municipalities out of 8,115. One could argue that this loss of observations might undermine the representativeness of our sample and, consequently, the external validity of our estimates. However, as shown in Figure 1, the distribution of our sample by geographical area is very similar to that of the universe of Italian municipalities. As far as the size is concerned, our sample is under-represented among small villages (with less than 1,000 residents, see Figure 2), probably because they have more difficulties reporting detailed balance-sheet data. Note, however, that less than 2 percent of population lives in these villages. The rest of the distribution nearly follows that of the whole sample. All these figures make us confident that despite of the missing values in our inefficiency measure our findings can be credibly extended beyond the subset we use.

Main summary statistics of all the explanatory variables are reported in Table 4.

3   Empirical approach and results

After constructing indicators for individual tax morale and local public spending inefficiency, we now turn to the estimation of the empirical relationship between the two variables. Our baseline specification is:

$$TM_i = \alpha + \beta \cdot X_i + \delta \cdot PSI_{m(i)} + \eta_{r(m(i))} + \varepsilon_i$$

where TM_i is the tax morale of the individual i who lives in municipality $m(i)$; X_i contains individual attributes (age, age squared, income, occupation, education, etc.); $PSI_{m(i)}$ is our measure of public spending inefficiency at the municipal level; regional-fixed effects $\eta_{r(m(i))}$ account for any time-invariant and region-specific factor including the quality of those public goods whose production is organized at the regional level (e.g., health services) and/or goods delivered from the central state but whose quality may vary mainly across regions (e.g., public order). After merging individual data on tax morale with aggregate data on public spending efficiency – using the municipality where the individual resides as the key variable – the final sample contains 1,115 observations.

It is worth noticing that we estimate the impact of inefficiency, that is measured at the municipal level, on tax morale that is based on a number of individual judgments not explicitly related to the local government or local taxation. However, resources collected by taxation are used to provide different public goods, including welfare and public services at the local level. Reasonably, the taxpayers' propensity to pay taxes depends on the inefficiency of different institutional actors, such as the central government, the regions, and the

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[10] We also check for stronger conditions. In addition to the internal consistency described in the text, we trim outliers in the ratios between expenditure and population and between output indicators and population. Results are unaffected.

municipalities. In our cross-section framework inefficiency of central government is not identifiable while that of the 20 regional governments is hardly identifiable in a credible manner because of the low variability in the data and the high likelihood of obtaining a spurious correlation. Therefore, our identification strategy consists of exploiting the heterogeneity of inefficiency across municipalities and, at the same time, controlling with regional-fixed effects for any other potential source of taxpayer satisfaction derived from any interaction with other segments of the public sector. If our findings were valid also with respect to the other levels of government – and we think this is the case – our estimate could be interpreted as a lower bound of the overall effect of the inefficiency of the whole public sector.

Two issues regarding our estimating equation need to be mentioned. First, as shown by Moulton (1990) in a regression performed on micro units and including aggregated (in our case municipality-level) variables, the standard errors from OLS will be underestimated. To address this issue, we cluster standard errors at the municipality level. Second, standard errors are also bootstrapped (with 1,000 replications) because $PSI_{m(i)}$ is a generated regressor.

3.1 Baseline estimations

Results of our basic regressions are reported in Table 5. The specification in column 1 includes proxies for the economic status and the sociodemographic characteristics of the individual, 20 regional-fixed effects and our measure of public spending inefficiency.

Age has an inverse U-shaped relationship with *TM*, although the coefficient of second-degree term is not significant in all specifications. Gender appears not to be significant, whereas education has a weak positive association with tax morale: individuals with a higher-education level show a greater willingness to pay taxes. We also include controls for the economic status of the householders. Tax morale increases with disposable income, whereas the dummy for the self-employed enters with a negative sign, although it is not significant.[11] More importantly, our measure of public spending inefficiency enters with the expected negative sign, and it is significant at the 1 percent level. Taxpayers interacting with a more efficient public sector are likely to show a higher level of tax morale. Our result can be interpreted by looking at the interaction between citizens and the government as a contractual relationship, implying duties and rights for each contract partner. If the taxpayer observes that the tax burden is not spent efficiently, he will feel cheated and his willingness to cooperate will fall.

Looking for a preferred specification, in columns (2) to (5), we include a number of additional individual controls. In column (2), we introduce dummies for the birthplace area – northwest, northeast, center, south, and islands for those who are Italians and continents for those who come from abroad – to control for

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[11] We also included additional controls for the number of household components and dummies about the job qualification and sector of activity (not reported in the table).

cultural traits inherited from the region where the individual is born. In column (3), we add a dummy that is equal to 1 if the individual has taken part in social, environmental, or cultural associations. This dummy is intended to capture the individual proclivity to contribute to his local community. In column (4), we include a dummy that is equal to 1 if, in the individual's view, the government should provide as many public services as possible, even if it implies increasing taxes – say a leftist orientation of the householder. Finally, in the last column, we consider the additional individual controls all together. We find that tax morale is higher for those who participate in social activities and those who are favorable to more state intervention in the economy. More importantly, the coefficient of *PSI* is unaffected.

The role of *PSI* in shaping tax morale is economically relevant. For instance, according to our estimates in column (5), reducing inefficiency by one standard deviation would entail an increase in *TM* equal to 20 percent of its standard deviation. A similar exercise that simulates a reduction of *PSI* from the 75th to the 25th percentile has a similar conclusion, confirming that the estimated effect is non-negligible. As already stated, since we can not estimate the effects at the other levels of the government, our estimates represent a lower bound of the impact of the inefficiency of the whole public sector.

3.2   Identification issues

Is it possible to interpret the evidence shown thus far in a causal sense? The answer is affirmative as long as the assumption of the exogeneity of *PSI* holds. However, there are three reasons why it may be not the case.

First, some form of reverse causality may be at work. It may happen that lower tax morale leads to lower tax revenues and this, in turn, might affect efficiency (for example, forcing municipalities to manage more efficiently the resources available). If so, this would imply a positive relationship between tax morale and inefficiency, so that the size of the "real" negative effect would be even larger than that we estimate. However, in the Italian institutional setting, this channel is unlikely to be at work as local tax revenues account only for one fourth of the municipalities' total revenues. More generally, we think that in our model the scope for reverse causality is negligible because of the joint use of an individual variable as dependent variable (*TM*) and an aggregate variable as a target regressor (*PSI*). Finally, *PSI* is computed on lagged data so further restricting the scope of some form of reverse causation.

Second, and more importantly, the endogeneity of inefficiency may depend on a local omitted variable (e.g., public spirit) that constitutes a confounding factor driving the correlation between *PSI* and *TM*, absent any causal link between these two variables. A third source of endogeneity may be the spatial sorting of taxpayers across municipalities: it may happen that individuals with higher morale tend to move to cities that are characterized by higher efficiency in the provision of public goods. In this case, the estimated coefficient of *PSI* merely captures the location choices of taxpayers.

A traditional solution to these potential drawbacks is to resort to instrumental variable estimation. Unfortunately, in our case it is very unlikely to find a suitable and credible instrument for *PSI*, that is, a variable correlated to inefficiency but orthogonal to tax morale. In what follows, we discuss the alternative strategies we adopt to address these potential sources of endogeneity.

Omitted variable bias. To minimize the omitted variable bias, we add a rich set of covariates including fixed effects at a finer partition of the territory. Specifically, we sequentially augment the regression in Table 5, column 5, with a number of variables measuring socioeconomic conditions and demographic characteristics of the municipalities where individual resides; moreover, we include provincial fixed effect (NUTS3 in Eurostat classification) in isolation and together with the other covariates (Table 6).

We start by including the log of GDP per capita of the local labor market (LLM) which city *m* belongs to; it is aimed to capture the degree of economic development of the area and its impact on our variables of interest. We also control for the incidence of the service sector. The former has no effect on *TM* whereas the latter is weakly significant and has a negative sign. A further control is the size of the municipality where the individual resides, which can affect both the efficiency of local authorities (e.g., because of congestion costs or scale economies in the production of public goods) and the individual tax morale (e.g., in larger communities the number and the type of interactions vary, and this may affect an individual's propensity to pay taxes). In our data the size of the municipality does not affect *TM*. To the contrary, the demographic structure of the population, as measured by the percentage of young individuals, negatively shapes *TM*. We control also for the incidence of foreign people since Luttmer (2001) finds that support for welfare is higher among people who live near many welfare recipients of the same race. [12] Therefore, we expect the individual propensity to comply with fiscal obligations to be lower in those municipalities where there are more foreign people; on the other hand, the presence of foreign people may have consequences for the activity of the local administration (e.g., issuing certificates etc.). This variable seems to play no role in determining individual tax morale. In all these specifications, the coefficient of *PSI* remains stable and highly significant.

After the economic and demographic variables, our last set of controls includes those covariates that approximate the degree of civism at the local level. We start controlling for the local endowment of human capital as measured by the percentage of graduates among local residents. This may affect the efficiency of the municipality if it ensures that the local administrators are on average more qualified. Furthermore, if we admit that those who are better educated possess higher civic values, they may affect individual tax morale through peer pressure. The variable enters with a positive and significant coefficient; however, our finding on the *PSI* role remains unchanged. In addition, we include proxies for

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[12] The explanation is that individuals tend to have hostile reactions when they see welfare recipients who belong to a different ethnic group and sympathetic reactions otherwise.

social capital that may reasonably affect both tax morale and public spending inefficiency (e.g., through positive pressure on the activity of local authorities). Social capital is measured by using both the percentage of voters in the general elections and the share of people engaged as volunteers in the nonprofit sector. In both cases, social capital does not shape individual tax morale, and, more importantly, its inclusion does not significantly affect the coefficient of *PSI*.

Finally, we push forward this kind of robustness checks and we introduce province-level fixed effects, in isolation of and jointly with all other covariates.[13] Our finding on *PSI* is qualitatively confirmed.

Overall, we believe the results reported above constitute a strong argument against the traditional omitted variable bias critique. We are aware that performing a randomized experiment would be ideal but, at the same time, it is hard to imagine the existence of some confounding factor that *(i)* is not correlated with any of the variables shown in Table 6 and *(ii)* varies within provinces.

Spatial sorting. One may argue that our efficiency measure is endogenous because of spatial sorting of citizens. The argument is that a more efficient local administration can attract people with higher tax morale. If this is the case, the positive association we observe between tax morale and public spending efficiency is generated by the selective assignment of individuals to cities. To deal with this issue, we exploit the confidential SHIW data on the birthplace of workers. We define individuals as "stayers" if they live in the same province in which they were born and "movers" otherwise.

To leave out selective migration of individuals with higher tax morale, we run the regression on the subsample of stayers. The coefficient of *PSI* is only partially affected, and it remains significantly different from zero at the 1 percent level (Table 7). Furthermore, to deal with the fact that the stayers are a selected sample of the population, we adopt a Heckman selection model. As exclusion restriction, we use a dummy variable that is equal to 1 if the house of residence was inherited and 0 otherwise. The rationale for this choice is that the propensity to move may be lower for those who inherit the house where they live since they would have to liquidate their housing asset in a given locality to buy a new house elsewhere, thus facing sizeable switching costs. Moreover, there may be intangible linkages between individuals and an inherited house that may affect the propensity to move. The coefficient of this variable in the selection equation is statistically different from zero, and the sign is negative as expected. More importantly, the role of *PSI* in shaping individual tax morale is confirmed.

Alternatively, we considered the entire sample with the introduction of a new (dummy) variable that distinguishes stayers from movers. Our results show that movers do not have a tax morale significantly different from that of stayers.

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[13] In 2004, Italy was divided into 103 provinces. A much more demanding test would have consisted of the introduction of LLM fixed effects. However, statistical considerations prevent us from performing such a test: in our data; there are 80 LLMs and 99 municipalities, so inserting LLM fixed effects implies that the estimation of the parameter of *PSI* is based on average on 99/80 = 1.238 municipalities per LLM. This clearly casts doubt on the statistical reliability of the test.

Furthermore, the interaction between our measure of public spending inefficiency and the dummy variable for movers is not significant. Therefore, we conclude that spatial sorting does not seem to be a relevant issue in our data. As a partial explanation for these findings, it should be recognized that the choice of location is strongly driven by other factors such as family links, migration costs, employment relationships.

3.3   Public spending: level, efficiency, and autonomy

As we have seen above, spending efficiency contributes to an increase in the citizens' propensity to pay taxes. However, individual tax morale is likely to be affected also by the level of public spending and by the degree of fiscal autonomy of municipalities. In particular, tax morale is expected to be higher where citizens see more benefits in return for their tax contributions (Alm et al., 1992a, 1992b). In addition, recent works have emphasized the role of fiscal autonomy in shaping individual tax morale. Güth et al. (2005) argue that the taxpayers exhibit less tax morale under centralized tax structures. Similarly, Torgler and Werner (2005) state that greater fiscal autonomy allows regions to spend the tax revenues according to local preferences and this, in turn, might have a positive impact on tax morale.[14]

In this subsection, we refine our findings by providing a more comprehensive analysis of the role of the public sector. In doing so, we assess how the level of public spending and the degree of fiscal autonomy, together with spending inefficiency, affect individual tax morale. Table 8 reports these further results. For the sake of simplicity, we report only the results on *PSI* and on the other two key variables, which are included separately in the first two columns and simultaneously in the third one. As expected, the coefficient on the level of public spending per capita enters with a positive sign, and it is significantly different from zero. On the other side, we find a weak positive relationship between fiscal autonomy and tax morale, thus partially confirming the results by Torgler and Werner (2005).[15] At the same time, the coefficient of public spending inefficiency remains negative and highly significant.

It is also likely that individual sensitivity to municipal inefficiency changes with the level of public spending and the degree of fiscal autonomy. To investigate this issue, we divide the sample according to both the amount of public spending per capita and the index of fiscal autonomy. The last four columns of Table 8 report the results of these sample splits. The negative impact of *PSI* on individual tax morale is confirmed in the four sample splits. However, it is

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[14] At the same time, the degree of autonomy of the municipality may affect the efficiency of public spending through several channels. For example, a higher dependence on the central state may lower the incentive of local managers to efficiently spend the resources. Therefore, fiscal autonomy could be an important omitted variable that drives the observed association between tax morale and public spending efficiency.

[15] Fiscal autonomy is measured as the ratio between municipal tributary plus extra tributary revenues and total revenues.

significantly different from zero (and it has a higher magnitude) only for those municipalities that have lower public spending per capita or a higher degree of fiscal autonomy.[16] Our interpretation of these results is that citizens treated with a higher level of public spending are more satisfied with the fiscal exchange and therefore are less worried about spending efficiency. Conversely, living in a municipality with a lower level of public spending may generate resentment in the taxpayer because he considers the received quantity of goods and/or services inadequate with respect to his tax payment. As a reaction, the citizen is more willing to control how resources are spent and he becomes more sensitive to spending efficiency.

As far as the second split is concerned, it is likely that higher local fiscal autonomy moves the government closer to the citizens, and this entails greater transparency for the relationship between inputs and outputs. Citizens attach more responsibility to municipalities when these rely more heavily on local resources, and react with lower tax morale when they perceive public spending as inefficient.

3.4 Further robustness checks: measurement issues of tax morale and inefficiency

The core of this paper is the analysis of the relationship between two variables that are not easily measurable. Consequently, this subsection is devoted to examine the validity of our measures and to check the robustness of our findings when different measures of both tax morale and public spending inefficiency are used.

First let us consider tax morale. Since it is (inversely) correlated to underground economy and tax evasion, a natural test is to see if our measure satisfies these correlations.[17] Using region-level aggregate data, we find that this is the case as shown in Figure 3 (with respect to shadow economy) and in Figure 4 (as regards tax evasion). Therefore our measure of tax morale seems to capture in a proper way the propensity to comply with fiscal obligations and it is strongly related to compliance behaviors. As a further robustness check, we separately consider each of the items used to build our measure of tax morale. We transform the items described in Table 1 with dummy variables that take the value 1 when the individual shows a high level of tax morality and 0 otherwise (see Table 9). The coefficient of public spending inefficiency has the expected sign, and it is significantly different from zero in almost all the specifications. In particular, as shown in column (1), a less efficient local authority negatively affects the individual propensity to pay for a ticket on public transport. Our results are confirmed also for the items in columns (2) to (4) that are closer to the definition of tax morale.

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[16] Some caution is needed in the interpretation of these results due to the smaller size of the samples.

[17] Similarly, Torgler (2005b), Alm and Torgler (2006), and Torgler and Schneider (2007) observe a significant negative correlation between tax morale and a shadow economy.

Turning to our measure of spending inefficiency, we start checking its validity with a simple test. We use data on citizens' satisfaction with the services offered by the municipality where they live, taken from the 1993 issue of the SHIW. Respondents are asked about their degree of satisfaction on a (1–10) scale about a number of public goods, such as the functioning of the municipality's offices, road circulation, waste collection and so on. For each individual, we average all these answers to obtain a measure of individual overall satisfaction, and then we regress it on the inefficiency index together with some individual-level controls (income, age, sex, education, etc.). The OLS estimate of the inefficiency coefficient equals -0.398 (standard error = 0.180), thus indicating that higher inefficiency is significantly associated with lower satisfaction.[18]

However, we can not completely rule out the possibility that our results depend on some of the empirical choices we have made in the computation of efficiency measure. Therefore, we consider two alternative measures of public spending inefficiency by changing the number of public goods and the methodological approach (Table 10). First, we restrict the number of outputs to the seven that are mostly provided directly by the municipalities; specifically, we exclude nursery schools and waste collection that sometimes are outsourced to private companies. This exclusion is motivated by the fact that outsourcing of public services might affect our inefficiency measure. However, the latter continues to have a negative and significant impact on individual morale (column 1). Finally, we provide a measure of efficiency that is calculated using a completely different approach – the Data Envelopment Analysis (DEA) – since the procedure chosen, as pointed out by De Borger and Kerstens (1996), may affect both the shape of the efficiency distribution and the ranking of municipalities. The DEA, as opposed to a stochastic frontier, is a nonparametric approach and therefore it is less prone to misspecification. On the other hand, nonparametric models are more sensitive to outliers.[19] In these cases, the expected sign is positive because the DEA furnishes a measure of efficiency. Our results are qualitatively confirmed (column 2).

4   Conclusions

Tax evasion is pervasive in many countries and encouraging tax compliance is

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[18] Results are available from the authors upon request. Obviously this test is valid as long as inefficiency is strongly persistent over time, given that satisfaction is measured in 1993 and inefficiency is referred to the 2001–2004 period. However this seems to be a reasonable assumption and it is confirmed in our data: inefficiency has been separately re-estimated using cross-sectional data for 2001 and 2004, and the spearman rank correlation between the two indicators is equal to 0.64.

[19] The DEA has a further disadvantage with respect to stochastic frontiers: it requires a balanced panel, and this implies, in our case, a severe reduction of the number of observations. We choose the following strategy to partially solves this problem: we compute a municipal measure of efficiency for each year for which observations are available; then we assign to each municipality the mean of efficiency measures across years. See Lovell (1993) for a detailed review of the DEA.

one of the most debated issues for policy makers. However, the magnitude of the phenomenon implicitly defines the complexity of the issue and the difficulty of finding the right policy options. At the same time, the efficiency of public spending is becoming a more pressing policy challenge. Governments and local authorities have to deal with increased pressures on their budgets to ensure the fiscal discipline. In this paper, we examine whether encouraging a more efficient spending of public resources, apart from being a good policy goal per se, can contribute to an increase in the citizens' propensity to pay taxes.

We find that tax morale is higher when the taxpayer perceives and observes that the government is efficient; that is, it provides a fair output with respect to the revenues. This evidence can be interpreted in terms of a psychological contract between taxpayer and fiscal authorities in which the former punishes the local government when he observes that resources are not spent well. Therefore, encouraging more efficient spending of public resources has wider consequences and contributes to increasing the citizens' propensity to pay taxes. This evidence does not seem to be driven by some confounding factor at the municipality level or by spatial sorting of citizens and proves robust when accounting for alternative measures of both inefficiency and tax morale. We also find that the negative effect of inefficiency is larger if the level of public spending is lower and/or the degree of fiscal autonomy is higher. We interpret the former of these differential effects as a form of substitutability between level and inefficiency of public spending and the latter as the effect of "proximity" between taxpayer and public sector.

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Tables and figures

Table 1: Items about public spirit and taxation[1]

(1) Do you think that *"not paying for your ticket on public transport"* is always justifiable, never justifiable, or justifiable to some extent? Please give your answer on a scale from 1 to 10, 1 being "never justifiable" and 10 being "always justifiable," and the numbers in between indicating various degrees of response.

Here is a set of statements that some interviewees before you made about Italy's tax system. To what extent do you agree with each of them? Please give only one answer for each statement: 1 = not at all, 2 = very little, 3 = so-so, 4 = quite a lot, 5 = very much
(2) *"Paying taxes is one of the basic duties of citizenship"*
(3) *"Not paying taxes is one of the worst crimes a person can commit because it harms the whole community"*
(4) *"It is right not to pay taxes if you think they are unfair"*
(5) *"Even if someone thinks a tax is unfair, he/she should pay it first and then complain if necessary"*

(6) Do you think it would be a good thing if *"tax inspections were made more often,"* or not? Please answer using one of the following statements: 1 = Yes, I would like them to be done much more often because it's the only way to stop tax evasion; 2 = Yes, I would like them to be done more often, but within limits, to stop the Government interfering too much in people's lives; 3 = I think things are all right as they are; 4 = No, I wish they were done less often because the present level of control is already too great; 5 = No, absolutely not; I think they should be done less often.

[1] The items in *italics* are those considered to build the tax morale synthetic index.

Table 2: Descriptive statistics of tax morale

	Mean (st. err.)
All sample	0.000 (1.430)
By income quartiles:	
1° quartile	*-0.378 (1.520)*
2° quartile	*-0.085 (1.384)*
3° quartile	*0.109 (1.364)*
4° quartile	*0.330 (1.360)*
By level of education:	
At most compulsory school	*-0.159 (1.424)*
Diploma	*0.205 (1.410)*
University degree	*0.461 (1.353)*
By professional condition:	
Employees	*0.084 (1.444)*
Self-employed	*-0.187 (1.411)*
By geographical area:	
North	*0.146 (1.400)*
Center	*0.156 (1.388)*
South	*-0.306 (1.450)*
# observations	3,798

Table 3: Expenditures and output indicators

Expenditure for:	Output:
Public street lighting	Number of lighting points
Technical office	Building permits released
Local police	Kilometers covered
Nursery school	Students enrolled in nursery school
Waste collection	Tons of waste collected
Road conditions and traffic	Kilometers of local roads
Electoral service	Persons enrolled in electoral list
Registry office	Number of certificates released
National service	Persons enrolled in national service list

Source: Italian municipalities' balance sheet accounts.

Table 4: Descriptive statistics of explanatory variables

Variable	Mean *(standard deviation)*
Public spending inefficiency	1.81 *(0.378)*
Individual characteristics:	
Age	56.83 *(15.773)*
Female	0.40 *(0.488)*
With a diploma (upper secondary school)	0.29 *(0.454)*
With a university degree	0.09 *(0.281)*
Log of disposable income	10.09 *(0.659)*
Self-employed	0.10 *(0.300)*
Participation in social activities	0.14 *(0.348)*
Leftist orientation	0.73 *(0.444)*
Movers	0.34 *(0.472)*
Economic and social variables at the local level	
Log of GDP pro capita in the LLM	-2.10 *(1.544)*
Firms with less than 10 employees in the LLM	53.15 *(10.78)*
Percentage of services in the LLM	33.10 *(5.493)*
Log of population in the municipality	10.34 *(1.753)*
Percentage of foreign people in the municipality	0.04 *(0.027)*
Percentage of young people (less than 15) in the municipality	0.14 *(0.028)*
Electoral participation in the LLM (general elections 2001)	82.01 *(5.801)*
Percentage of graduates among residents in the municipality	7.31 *(3.276)*
Percentage of people engaged as volunteers in the nonprofit sector in the LLM	0.07 *(0.053)*
Other variables from the municipal balance sheets	
Log of public expenditure per capita	6.65 *(0.296)*
Financial autonomy	0.67 *(0.131)*

Source: SHIW (2004) for individual data; Istat for economic and social variables; Italian municipalities' balance sheet accounts for local public finance variables.

Table 5: Determinants of tax morale

	(1)	(2)	(3)	(4)	(5)
Public spending inefficiency	-0.767***	-0.793***	-0.751***	-0.764***	-0.775***
	(0.274)	(0.266)	(0.271)	(0.268)	(0.257)
Age	0.036*	0.033*	0.035*	0.039**	0.035*
	(0.020)	(0.019)	(0.019)	(0.019)	(0.018)
Age squared/100	-0.025	-0.023	-0.024	-0.028*	-0.025
	(0.016)	(0.015)	(0.016)	(0.016)	(0.015)
Log of disposable income	0.242**	0.226**	0.234**	0.238**	0.213**
	(0.095)	(0.094)	(0.094)	(0.093)	(0.091)
Self-employed	-0.203	-0.263	-0.203	-0.139	-0.201
	(0.162)	(0.163)	(0.163)	(0.158)	(0.158)
Female	-0.159	-0.159	-0.139	-0.171	-0.151
	(0.109)	(0.112)	(0.109)	(0.108)	(0.109)
Upper secondary school	0.189**	0.197**	0.170*	0.187**	0.178*
	(0.094)	(0.095)	(0.097)	(0.095)	(0.096)
University degree	0.210*	0.232*	0.173	0.172	0.161
	(0.127)	(0.135)	(0.131)	(0.131)	(0.143)
Regional fixed effects	YES	YES	YES	YES	YES
Occupation fixed effects	YES	YES	YES	YES	YES
Sector of econ. activity fixed effects	YES	YES	YES	YES	YES
Area of birth fixed effects		YES			YES
Participation in social activities			0.366**		0.345**
			(0.149)		(0.140)
Leftist orientation				0.466***	0.450***
				(0.123)	(0.121)
Observations	1,115	1,115	1,115	1,115	1,115

Bootstrapped standard errors based on 1,000 replications are reported in brackets; they are adjusted for clustering at the municipal level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6: Exploiting local-level determinants

	Local-level control	Public spending inefficiency
Log of GDP pro capita in the LLM	-0.054	-0.807***
	(0.056)	(0.258)
Percentage of services in the LLM	-0.024*	-0.779***
	(0.014)	(0.249)
Log of population in the municipality	0.005	-0.770***
	(0.080)	(0.277)
Percentage of young people in the municipality	-8.019*	-0.754***
	(4.864)	(0.259)
Percentage of foreign people in the municipality	-0.123	-0.774***
	(5.142)	(0.258)
Percentage of graduated people in the municipality	0.036*	-0.849***
	(0.021)	(0.264)
Electoral participation in the LLM	0.004	-0.776***
	(0.025)	(0.263)
Share of people engaged as volunteers in the nonprofit sector in the LLM	-0.034	-0.847***
	(0.030)	(0.265)
Province fixed effects	YES	-0.810*
		(0.463)
Province fixed effects plus all other local-level controls	YES	-1.027***
		(0.574)
Observations		1,115

The specification includes all the individual variables reported in table 5 column (5), whose results are not reported for simplicity. The first column contains the estimates for each of the additional controls; the second column reports the estimates for public spending inefficiency. Bootstrapped standard errors based on 1,000 replications are reported in brackets; they are adjusted for clustering at the municipal level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Controlling for spatial sorting

	Additional controls	Public spending inefficiency
[subsample of only stayers]	-	-1.027***
		(0.326)
[subsample of only stayers with selection *a la* Heckman]	-	-1.011***
		(0.227)
Mover [whole sample]	-0.011	-0.799***
	(0.155)	(0.267)
Mover * public spending inefficiency [whole sample]	0.026	-0.808***
	(0.081)	(0.255)

The specification includes all the individual variables reported in table 5 column (5), whose results are not reported for simplicity. The number of stayers in the sample is 674. The exclusion restriction for the Heckman specification is inheritance of home of residence. The first column contains the estimates for the additional controls; the second column reports the estimates for public spending inefficiency. Bootstrapped standard errors based on 1,000 replications are reported in brackets; they are adjusted for clustering at the municipal level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 8: Exploiting balance sheet variables

	Including level of public spending (LPS)	Including index of fiscal autonomy (FA)	Including both LPS e FA	Split of the sample by LPS		Split of the sample by degree of FA	
				High LPS	Low LPS	High FA	Low FA
Public spending inefficiency	-0.830***	-0.794***	-0.853***	-0.549	-1.093**	-1.031**	-0.554
	(0.257)	(0.256)	(0.253)	(0.408)	(0.468)	(0.442)	(0.492)
Level of public spending	0.741**		0.769***	0.612	0.843	0.237	0.742
	(0.289)		(0.305)	(0.801)	(1.107)	(0.824)	(0.494)
Index of fiscal autonomy		1.661	1.781*	1.583	0.935	3.970	-1.587
		(1.035)	(0.974)	(1.478)	(2.919)	(3.269)	(2.760)
Observations	1,115	1,115	1,115	555	561	562	553

The specification includes all the individual variables reported in table 5 columns (5), whose results are not reported for simplicity. Bootstrapped standard errors based on 1,000 replications are reported in brackets; they are adjusted for clustering at the municipal level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9: Controlling for various definitions of tax morale

	"ticket on public transport" (1)	"paying taxes is a basic duty" (2)	"not paying taxes is a crime" (3)	"paying taxes even if they are unfair" (4)	"first pay, then complain" (5)	"more tax inspections" (6)
Public spending inefficiency	-0.133**	-0.127*	-0.144**	-0.138***	-0.048	-0.227***
	(0.064)	(0.069)	(0.068)	(0.052)	(0.047)	(0.085)
Age	0.005	0.006	0.009	0.000	0.003	0.014**
	(0.006)	(0.006)	(0.006)	(0.004)	(0.005)	(0.007)
Age squared/100	-0.002	-0.005	-0.007	-0.001	-0.002	-0.010*
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.006)
Log of disposable income	0.055*	0.035	0.024	0.069***	0.040*	0.010
	(0.032)	(0.031)	(0.026)	(0.023)	(0.021)	(0.029)
Self-employed	-0.016	-0.131**	-0.056	-0.020	0.043	-0.189**
	(0.057)	(0.066)	(0.059)	(0.047)	(0.052)	(0.077)
Female	0.007	-0.083**	-0.085***	-0.002	-0.006	-0.035
	(0.035)	(0.033)	(0.030)	(0.031)	(0.022)	(0.039)
Upper secondary school	-0.022	0.099**	0.049	0.035	-0.024	-0.011
	(0.039)	(0.039)	(0.040)	(0.032)	(0.029)	(0.033)
University degree	0.005	0.024	0.081	0.017	-0.004	0.040
	(0.048)	(0.073)	(0.050)	(0.048)	(0.043)	(0.059)
Regional fixed effects	YES	YES	YES	YES	YES	YES
Occupation fixed effects	YES	YES	YES	YES	YES	YES
Sector of econ. act. fixed eff.	YES	YES	YES	YES	YES	YES
Area of birth fixed effects	YES	YES	YES	YES	YES	YES
Particip. in social activities	0.007	0.119***	0.095**	0.048	0.031	0.115**
	(0.042)	(0.044)	(0.044)	(0.037)	(0.039)	(0.053)
Leftist orientation	0.096**	0.034	0.082***	0.084***	0.010	0.118***
	(0.038)	(0.034)	(0.030)	(0.026)	(0.024)	(0.038)
Observations	1,115	1,115	1,115	1,115	1,115	1,115

(1) "Not paying for the ticket on public transport" is never justifiable. – (2) High agreement with "paying taxes is one of the basic duties of citizenship". – (3) High agreement with "not paying taxes is one of the worst crimes a person can commit because it harms the whole community". – (4) High disagreement with "it is right not to pay taxes if you think they are unfair". – (5) High agreement with "even if someone thinks a tax is unfair, he/she should pay it first and then complain if necessary". – (6) High agreement with "tax inspections be done much more often because it's the only way to stop tax evasion".
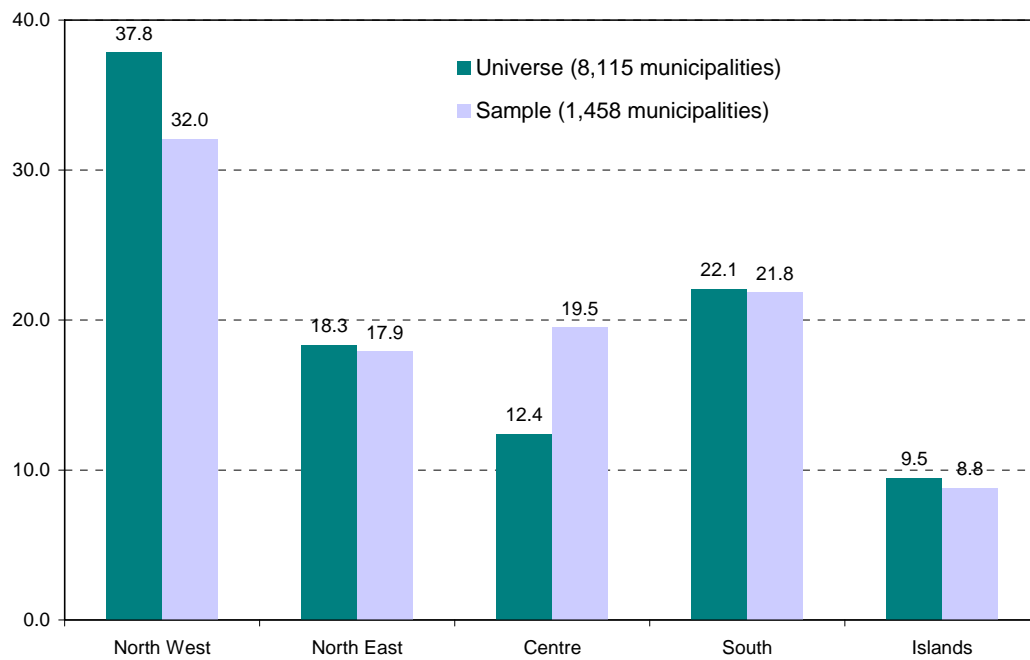Bootstrapped standard errors based on 1,000 replications are reported in brackets; they are adjusted for clustering at the municipal level. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: Controlling for various measures of public spending inefficiency

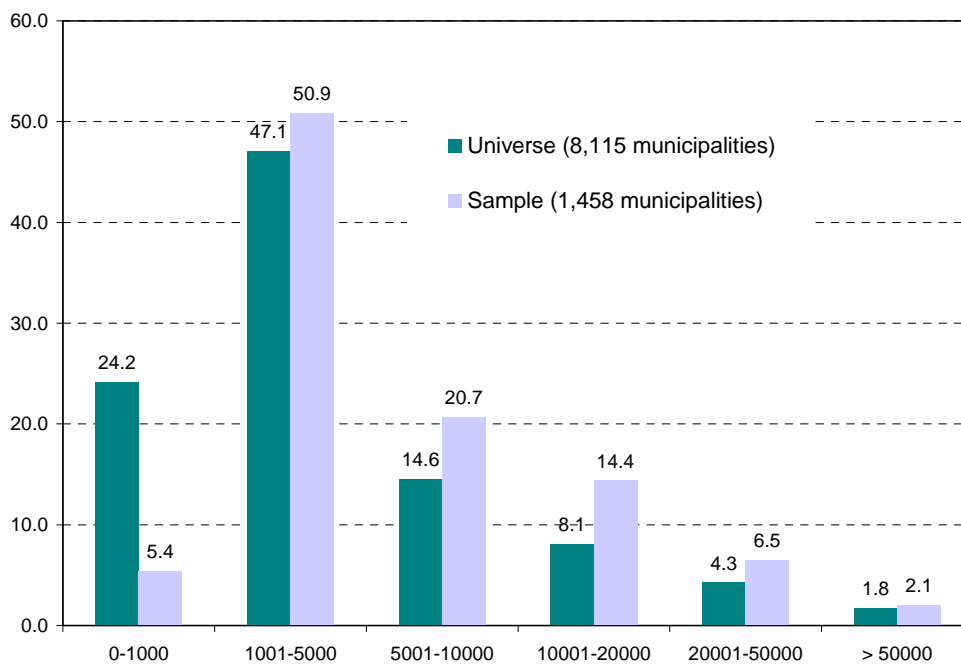|	Stochastic frontier with 7 outputs	DEA with 9 outputs
Public spending (in-)efficiency (1)	-0.060**	2.868**
	(0.024)	(1.369)
Age	0.035*	0.035*
	(0.018)	(0.019)
Age squared/100	-0.024	-0.024
	(0.015)	(0.016)
Log of disposable income	0.212**	0.238**
	(0.090)	(0.097)
Self-employee	-0.216	-0.189
	(0.163)	(0.167)
Female	-0.134	-0.158
	(0.107)	(0.108)
Upper secondary school	0.185*	0.198**
	(0.099)	(0.100)
University degree	0.155	0.148
	(0.143)	(0.143)
Regional fixed effects	YES	YES
Occupation fixed effects	YES	YES
Sector of econ. act. fixed effects	YES	YES
Area of birth fixed effects	YES	YES
Participation in social activities	0.366***	0.349**
	(0.139)	(0.137)
Leftist orientation	0.444***	0.456***
	(0.124)	(0.128)
Observations	1,115	1,115

(1) Our key explanatory variable is public spending inefficiency when measured by stochastic frontier and public spending efficiency when measured by DEA. Thus, the expected sign is negative in the first column and positive in the second column. Bootstrapped standard errors based on 1,000 replications are reported in brackets; they are adjusted for clustering at the municipal level. * significant at 10%; ** significant at 5%; *** significant at 1%.

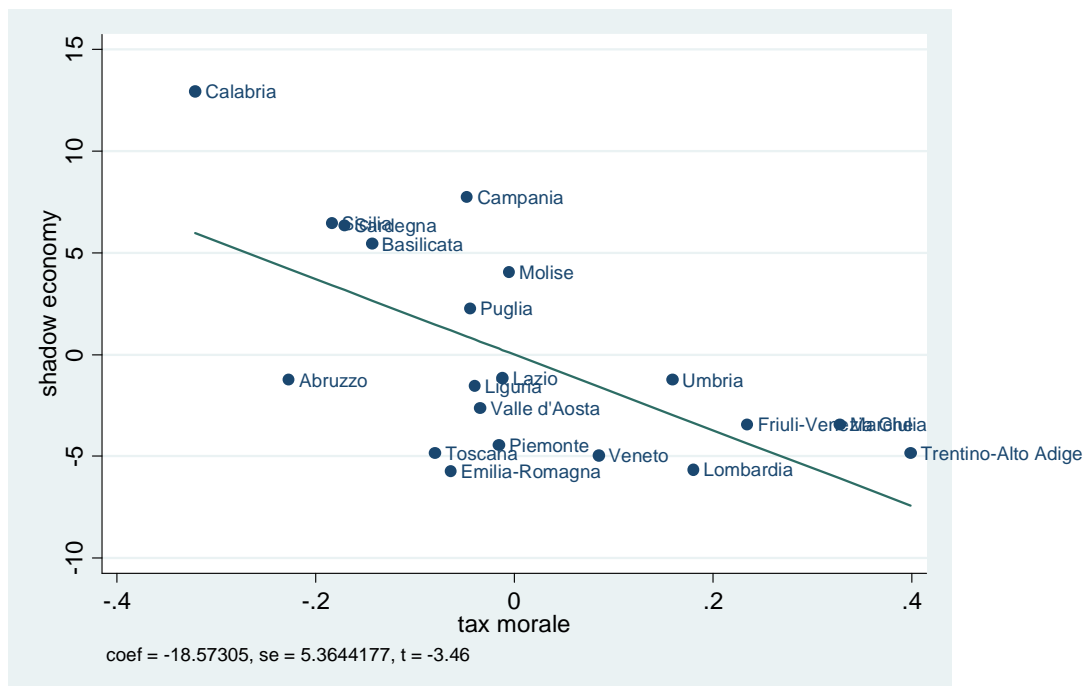**Figure 1: distribution of the selected sample of municipalities by geographical area**

Universe (8,115 municipalities)
Sample (1,458 municipalities)

	North West	North East	Centre	South	Islands
Universe	37.8	18.3	12.4	22.1	9.5
Sample	32.0	17.9	19.5	21.8	8.8

Source: Istat.

Figure 2: distribution of the selected sample of municipalities by size

Universe (8,115 municipalities)
Sample (1,458 municipalities)

	0-1000	1001-5000	5001-10000	10001-20000	20001-50000	> 50000
Universe	24.2	47.1	14.6	8.1	4.3	1.8
Sample	5.4	50.9	20.7	14.4	6.5	2.1

Source: Istat.

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Figure 3: Tax morale and shadow economy

coef = -18.57305, se = 5.3644177, t = -3.46

Source: our elaborations on data from SHIW and Istat.

Figure 4: Tax morale and tax evasion

coef = -.1712954, se = .07165947, t = -2.39

Source: our elaborations on data from SHIW; data on tax evasion on personal incomes are drawn from Ragazzi (1993).

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