Discussion Papers in Economic Behaviour

DPEB
02/19

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Abstract

Many empirical works confirmed the capacity of the "slippery slope" framework and tax morale in explaining tax compliance. So far, however, very few studies tried to fully integrate these two main behavioral approaches to understanding tax compliance. Indeed, a theoretical underpinning is still missing. In this paper, therefore, we first introduce tax morale and the "slippery slope" framework into an economic model of taxpayer's behavior and then we test it empirically. We find that for increasing overall tax compliance, voluntary tax compliance (trust and tax morale) is more effective than enforced tax compliance. Eventually, from a policy point of view, we suggest a strategy based on rewards for honest taxpayers.

JEL Codes**:** H26 · H3 · K42 · D22

Keywords**:** tax compliance; tax evasion; voluntary tax compliance; tax morale; enforced tax compliance.

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1. Introduction

Broadly, the related literature contemplates two main approaches to understanding tax compliance: an economic approach and a behavioral approach (see, e.g., Ritsatos, 2014; Mardhiah et al. 2019). There is, in fact, no doubt that not only the well-studied instruments of deterrence, such as audits and penalties (economic determinants of tax compliance), but also behavioral and psychological factors, such as perception of fairness, tax knowledge and tax morale, affect/lead to tax compliance (Wenzel 2002; Tyler 2006; Murphy and Tyler 2008; Feld and Frey, 2007; Alm and Torgler 2011; Molero and Pujol, 2012; Saad, 2014). In reality, however, nowadays the distinction between these two approaches is fleeting. Indeed, a combination of economic and behavioral approaches (precisely, the introduction of behavioral and psychological factors into standard economic models), has already been achieved (see, e.g., Prinz et al., 2014; Lisi, 2014 and 2016).

Among the psychological determinants of tax compliance, the literature concentrates on trust in and power of tax authorities (whose relation form the core of the so-called "slippery slope" framework) and tax morale. Many empirical works, indeed, have been conducted to test the capacity of these factors in reducing tax evasion, thus increasing tax compliance (see, again, Mardhiah et al. 2019). The concept of tax morale and the "slippery slope" framework (henceforth SSF) were introduced in the tax compliance literature to explain both the high degree of tax compliance in presence, in many countries, of a very low deterrence level (Torgler 2007; Slemrod 2007) and the huge differences in tax compliance between countries or regions despite the same tax and punishment policies (Rothstein 2000). A good example is the Italy's North-South divide, because tax and punishment policies are the same all over the country, whereas the two regions that differ in their history, i.e. in the social traditions and which persist over generations (Halla 2012). Also, traditional models à la Allingham and Sandmo (for an overview see Sandmo 2005), based only on risk aversion, monitoring probability and expected penalty, predict far too little compliance and far too much tax evasion (Feld and Frey 2002). Indeed, since the publication of Allingham and Sandmo's (1972) economic model of income tax evasion, a huge number of studies have tried to find empirical support for the deterrent effect of audits and fines (see, e.g., Andreoni et al., 1998; Kirchler, 2007; Kirchler et al., 2008b). The evidence, however, is weak and unstable (for a review see Kirchler et al. 2008b).

Tax morale is defined as "the intrinsic motivation of why people pay taxes", "a moral obligation to pay taxes", "a belief in contributing to society by paying taxes" (see e.g. Torgler, 2003, 2007; Torgler and Schneider 2007; Torgler and Schneider, 2009; Cummings et al.,

2009; Halla, 2012; Molero and Pujol, 2012). A positive tax morale is likely to reduce the probability of tax evasion (Kirchler, 2007), since an increase in reputational costs (feelings of guilt, social stigma) decreases tax evasion (Andreoni et al., 1998; Dell'Anno, 2009). Indeed, tax morale is usually modelled as an internalized social norm for tax compliance (Elster 1989), or against tax evasion, which renders evasion costly (Falkinger 1995; Kolm and Larsen 2002; Traxler 2010). Thus, tax evasion involves a moral cost, in the sense that an individual feels a sense of guilt or remorse for deviating from the social norm, or for defecting from others' expectations, because s/he has not been a "good member of society" (Traxler 2010; Kolm and Larsen 2002).[1] However, the more people evade taxes, the less attractive it is to follow the social norm (Gordon 1989). Tax morale affects tax compliance behavior, i.e. a higher (lower) tax morale reduces (increases) the level of tax evasion (Frey and Torgler 2007; Halla 2010). Indeed, differences in-between regions and countries in the proportion of tax evasion may be due to different moral costs (Halla 2010; Alm et al. 2006; Torgler 2007; Alm and Torgler 2006; Torgler 2005; Kolm and Larsen 2002; Posner 2000). Institutional arrangements, such as direct democracy, are correlated with a high level of tax morale (Alm et al. 1999; Feld and Tyran 2002; Torgler 2005).

The SSF was born in the field of Economic Psychology (Kirchler, 2007; Kirchler et al., 2008; Muehlbacher and Kirchler, 2010). This approach distinguishes two forms of tax compliance: voluntary and enforced compliance. Voluntary tax compliance depends on the trust that taxpayers have in tax authorities, whereas enforced tax compliance depends on the power of tax authorities, namely the effectiveness of tax authorities to clampdown on tax evaders. Hence, trust (in) and power (of) tax authorities are the major determinants for each form of compliance (Kogler et al., 2015). Basically, tax authorities can increase tax compliance by increasing solely one of these two factors. Intuitively, the positive effect of trust and power on tax compliance is larger when they are low (the well-known hypothesis of diminishing returns). Power is represented by deterrence instruments (audits and penalties, most of all), while trust depends mainly on how authorities approach taxpayers: the higher the trustworthiness and reliability of tax authorities, the larger the trust of taxpayers in their work. Trust in tax authorities, in particular, is necessary to foster and stabilise the voluntary cooperation of honest taxpayers (Kirchler, 2007; Kirchler et al., 2008; Muehlbacher and Kirchler, 2010). A key determinant of voluntary tax compliance is the presence of "good" institutions (high institutional quality), such as the equity and simplicity of the tax system, the efficiency and reliability of the government, the absence of corruption, less regulation and

[1] In Kim (2003), the moral cost depends on whether evasion is detected or not.

slim bureaucracies, high transparency and so on (see, e.g., Rothstein 2000; Tsikas 2017). In the so-called "synergistic tax climate", where the relationship between tax administration and the taxpayer is based on mutual trust, tax authorities do not need to resort to their power. Thus, voluntary tax compliance is high. Instead, in the so-called "antagonistic tax climate", where tax authorities and taxpayers act with a cops-and-robbers attitude, trust is low and tax authorities need to use their power, thus building enforced compliance rather than voluntary compliance (Gangl et al., 2012). Furthermore, the SSF suggests a crucial interaction of power and trust which increases the overall tax compliance (Kirchler et al., 2008; Muehlbacher and Kirchler, 2010). It follows that, *ceteris paribus*, a mix of trust and power is better than only power or only trust. Finally, a slippery slope situation occurs when both trust and power are low. In this case, in fact, even a small reduction in one or both these factors can have a strong negative effect on tax compliance.

Although the SSF postulates a positive relationship between power of tax authorities and tax compliance, empirical evidence is less clear and contradictory results are gathered (Park and Hyun,2003; Webley et al., 1991; Slemrod et al., 2001; Andreoni et al., 1998). Indeed, audits and penalties may guarantee enforced compliance but bear the risk of destroying existing voluntary compliance (Hofmann et al., 2008). Instead, in general, evidence shows that trust in tax authorities is positively correlated with tax payments (Hammar et al., 2009; Torgler, 2003). In a nutshell, the empirical evidence would seem to suggest that trust is more effective than power in increasing overall tax compliance. Recently, however, Mardhiah et al. (2019) found that enforced compliance has a negative influence on overall tax compliance. This is not exactly a confirm of the SSF theory, where also power of tax authorities is important for increasing tax compliance.

So far, however, very few empirical studies tried to fully integrate the SSF with tax morale. An exception is represented by Fischer and Schneider (2009) that show that tax morale affects the interplay between trust and power. However, this work uses tax morale as a proxy of overall tax compliance and focuses on the effect of tax morale, education, and political/democratic rights on the interplay between trust and power. Indeed, a high level of tax morale does not necessarily imply a high level of (overall) tax compliance, since tax morale, unlike tax evasion, does not measure individual behavior but rather individual attitude. Furthermore, the quoted work and other empirical studies (see, e.g., Wahl et al., 2010 and Kogler et al.; 2013; Kogler, Muehlbacher and Kirchler, 2013) have generally confirmed the SSF theory, without testing the non-linear relation between tax authority's two dimensions (trust and power) and tax compliance, namely the possibility that a "slippery slope" situation

emerges with respect to trust and power. This because a theoretical underpinning capable of linking theoretical and empirical analyses on these two main behavioral determinants of tax compliance is still missing.

The main aim of this paper, therefore, is to provide both a theoretical integration and an empirical assessment of these two important strands of tax compliance literature. In doing this, we first introduce both tax morale and the SSF into an economic model of taxpayer's behavior and then we test it empirically. We find that for increasing overall tax compliance, voluntary tax compliance (trust and tax morale) is more effective than enforced tax compliance. Eventually, from a policy point of view, we suggest a strategy based on rewards for honest taxpayers.

The rest of this paper is organized as follows. The next section introduces the costs and benefits of tax evasion into an economic model of taxpayer's decision; while Section 3 extends the theoretical model by highlighting the relation among tax compliance, trust in tax authorities, power of tax authorities and tax morale. Section 4 develops an empirical analysis in order to substantiate the main theoretical results. Section 5 summarizes the main contributions of the present work and provides some interesting policy implications.

2. The theoretical model

Based on Becker's (1968) approach known as the "economics of crime", in their seminal paper Allingham and Sandmo (1972) argue that the taxpayer's decision whether income is evaded or not depends on the probability to be detected and on the punishment inflicted in the case of detection. In short, a (rational and risk-neutral) taxpayer evades because of cost-benefit considerations and not because of a malicious motivation. The main problem with this economic approach is the explanation of the so-called "tax compliance puzzle", in the sense that empirically the model is not able to explain the high (low) degree of tax compliance (tax evasion) in the presence of low audit rates and mild sanctions. As a result, we introduce the main behavioral /psychological determinants of voluntary tax compliance (trust and tax morale) into the economic model of taxpayer's decision.

2.1 The costs and benefits of tax evasion

For the sake of simplicity, risk neutrality is assumed on the taxpayer's side (Srinivasan, 1973) instead of risk aversion (Allingham and Sandmo, 1972).

In order to find the taxpayer's decision, it is enough to introduce the costs and benefits of tax evasion into a simple profit/utility function (Π) of a representative economic agent:

$$\Pi = y - y^D \cdot \tau - \rho \cdot \varphi(e) \quad (1)$$

where y is true (net) income; y^D is declared income; τ is the tax rate (a "flat tax", for the sake of simplicity);[2] $e = (y - y^D)$ is the income tax evasion; ρ is the monitoring rate whereby tax authority detects tax evasion and levies the penalty $\varphi(e)$. Intuitively, it is assumed that $\varphi(e)$ is an increasing and convex function of the level of tax evasion. Tait (1991) indicates that when a taxpayer misreports a small amount, the purpose of the penalty is to dissuade him so that he does not repeat the violation; but when the fraud goes beyond the violation and falls into the realm of crime, harsh penalties, including jail sentences, may apply. Hence, an increasing and convex function for $\varphi(e)$ is able to depict this situation.

The income declared by taxpayers y^D is partly declared voluntarily and partly declared because of enforcement by tax authorities. Hence, tax compliance y^D can be the same, but motivation for the behavior varies. It follows that y^D represents the overall tax compliance. Thus, given the true income,[3] the close negative relation between tax evasion (tax non-compliance behavior) and tax compliance is very clear:

$$e = (y - y^D) \tag{2}$$

$$y^D = y - e \tag{2'}$$

with a loss of tax revenues equals to $(y - y^D) \cdot \tau$. As a result, under a standard approach of profit maximization, it is indifferent to choose the optimal level of declared income or, rather, the optimal level of tax evasion. In a nutshell, maximizing tax compliance involves minimizing tax evasion. By assuming that $\varphi(e) = (y - y^D)^\mu$ with $\mu > 1$, we get:

$$max_{y^D}\{y - y^D \cdot \tau - \rho \cdot \varphi(e)\} \tag{3}$$

$$\xrightarrow{yields} \tau = \rho \cdot (y - y^D)^{\mu-1} \cdot \mu \tag{4}$$

$$\xrightarrow{yields} y^D = y - \left(\frac{\tau}{\mu \cdot \rho}\right)^{\frac{1}{\mu-1}} \tag{4'}$$

At the optimum, therefore, the taxpayer chooses the optimal level of declared income by equating the marginal tax saving τ with the expected risk of tax evasion $\frac{d\varphi(e)}{dy^D} = \rho \cdot (y - y^D)^{\mu-1} \cdot \mu$. Unsurprisingly, declared income decreases with taxation and increases with monitoring rate. Indeed, when taxation is higher than the penalty applied, taxpayers will increase the share of tax evasion (namely, it will reduce y^D), while the opposite is true when the taxation is lower than the penalty applied (namely, taxpayers will decrease the share of tax evasion, thus increasing y^D). An interior solution with positive evaded and declared income is

[2] In Italy, one of the most industrialized countries with the highest share of tax evasion, there is debate about the introduction of a flat tax. According to the right political parties, the introduction of a flat tax would be capable, by itself, of reducing tax evasion.

[3] Starting from the seminal theoretical model of Allingham and Sandmo (1972), this is a common assumption in models of tax evasion.

ensured by the conditions $\frac{d\varphi(e)}{de} > 0$ and $\frac{d^2\varphi(e)}{de^2} > 0$. In a nutshell, it is always optimal for taxpayers to evade taxes, but at the same time, it is not optimal to evade all of the income, since the penalty increases at increasing rates with tax evasion. Finally, if the penalty applied when tax evasion is discovered is such that $\rho \cdot \varphi(e) \geq y - y^D \cdot \tau$, then the firm (or the job) or the business activity is closed, since $\Pi \leq 0$.

However, nothing can be said about the level of tax compliance (tax evasion) from a *normative* point of view, in the sense that it can be too low (too high) for a well-being of a society. State revenues collected by the fiscal authorities, in fact, are used to comply with the budget constraint, viz.:

$$y^D \cdot \tau + \rho \cdot \varphi(e) = g \geq \bar{g} \tag{5}$$

In short, the public spending per capita g must be higher, or at least equal to, a certain amount $\bar{g}$ in order to meet the needs of the public sector. Note that the relation between state revenues and tax compliance (tax evasion) is, a priori, ambiguous: an increase in y^D, in fact, increases tax revenues but decreases the expected penalty. However, tax agency should seek to maximize tax compliance (to minimize tax evasion); indeed, minimizing evasion is, *per se*, an important objective from a *normative* point of view since it reduces the tax inequality between compliant and non-compliant taxpayers (thus, redistributing the tax burden), at the microeconomic level, while it attenuates tax distortion at the aggregate level. The monitoring rate is a needful instrument of fiscal policy to fight against tax evasion and, at the same time, it increases state revenues. The probability of detection increases tax compliance, since audit is an effective tool to discourage cheating (Witte and Woodbury 1985; Alm 1991; Andreoni et al., 1998; Dubin 2007; Cummings et al., 2009). Also, tax audits have a direct deterrent effect on the audited taxpayers and an indirect deterrent effect on the other taxpayers (Alm et al., 2004). Therefore, to achieve both goals, namely maximizing state revenues and minimizing evasion, tax authority searches for the optimal monitoring rate:[4]

$$max_\rho \{y^D \cdot \tau + \rho \cdot \varphi(e) - \rho \cdot \vartheta\} \tag{6}$$

where $\vartheta > 0$ is the cost of monitoring. Precisely,

$$max_\rho \left\{y^D(\rho) \cdot \tau + \rho \cdot \left(y - y^D(\rho)\right)^\mu - \rho \cdot \vartheta\right\} \tag{6'}$$

since $\varphi(e) = (y - y^D)^\mu$ and y^D is itself a function of ρ, i.e. $\frac{\partial y^D}{\partial \rho} < 0$ from equation (3').

[4] Instead, as regard taxation as an instrument of fiscal policy to fight against tax evasion, the supporters of a (low) flat tax rate rely on a strong negative relation between declared income and taxation. However, since the cost of lowering taxation is almost nil, the optimal flat tax rate would lie near to zero. This, of course, would prejudice the observance of the government budget constraint.

$$\xrightarrow{yields} e^{\mu} + \left[\underbrace{\rho \cdot e^{\mu-1} \cdot \mu \cdot -\frac{\partial y^D}{\partial \rho}}_{>0}\right] = \left[\underbrace{\vartheta - \frac{\partial y^D}{\partial \rho} \cdot \tau}_{>0}\right] \tag{7}$$

Therefore, an "optimal" (positive) level of tax evasion also exists for the fiscal authorities. Intuitively, the optimal monitoring rate is not capable of completely eliminating the tax evasion. Thus, the key question is how to incentivize taxpayers' compliance (y^D), so as to have a high optimal level of tax compliance (y^{D^*}) evasion and thus a low ("optimal") level of tax evasion (e^*). This is a not trivial question, since tax compliance is due to both enforced compliance and voluntary compliance. Indeed, the income can be declared both voluntarily and forcibly. From an empirical point of view, however, the fiscal authorities can observe the overall tax compliance y^D, thus, estimating the level of tax evasion (e), but they are not able to tell precisely how much of the declared income is due to voluntary compliance or instead it is due to enforced compliance. From a policy point of view, it is very important to reply to this question. We address this issue in the next section that aims at linking theoretical and empirical models, as well as, behavioral and economic approaches.

2.2 Tax rewards, honest taxpayers and monitoring

Before focusing on the declared income, we suggest a simple policy strategy for increasing tax compliance without prejudging the budget constraint; rather, this strategy allows to increase the number of honest taxpayers and reduce monitoring costs.

We follow the key insight of the seminal paper by Falkinger and Walther (1991) and introduce into the theoretical model the possibility of a *tax reward* for honest taxpayers.

Suppose that – by means of automated information exchange – tax authorities are able to know a threshold value α of income (it could be a mean value for each working category) such that if the declared income is equal to or higher than that threshold value, the taxpayer is reputed honest, because s/he declared an appreciable part of the true income.

Formally, whenever $y^D \geq \alpha$, the taxpayer receives a *tax reward* $b > 0$ and, thus, $(\tau - b) < \tau$. Hence, in the model it is possible to distinguish the choice of the honest taxpayer from that of tax evader. Precisely, for the tax evader nothing changes, while for the honest taxpayer Equations (4) and (4') become:

$$(\tau - b) = \rho \cdot (y - y^D)^{\mu-1} \cdot \mu \tag{8}$$

$$\xrightarrow{yields} y^D = y - \left(\frac{\tau - b}{\mu \cdot \rho}\right)^{\frac{1}{\mu-1}} \tag{8'}$$

Of course, there is a positive relation between declared income and *tax rewards*. More interestingly, note that an increase in tax rewards can be offset by a reduction in monitoring

rate. As a result, by introducing *tax rewards* for honest taxpayers, government could both increase the number of honest taxpayers and reduce the monitoring rate, thus saving costs. Kastlunger et al. (2011) find that audited compliant taxpayers who are rewarded evaded less in the following period compared with audited compliant taxpayers who experienced no rewards. Instead, a tax reward for everyone could have a negative effect both from a behavioral point of view (to treat the taxpayers in the same way means to treat the honest taxpayers unfairly) and from an economic point of view (there is a budget constraint to comply with). Concisely, a *tax rewards* for honest taxpayers could trigger a virtuous circle. Anyway, the efficient use of rewards is a perfect complement of deterrence policies for fighting tax evasion (Alm et al. (1992).

From an empirical point of view, however, the evidence of positive effects of rewards on compliance is less straightforward. Bazart and Pickhardt (2011) find that positive rewards lead to a higher rate of tax compliance. Instead, Kastlunger et al. (2011) find that, overall, tax compliance was not affected by the rewards. Indeed, it seems that rewards provoked an all-or-nothing behavior, namely participants were either completely honest or evaded all of their income.

3. Theoretical hypotheses and the empirical model

As previously discussed, the income can be declared both voluntarily and forcibly and, thus, y^D implicitly includes both the "*voluntary tax compliance*" and the "*enforced tax compliance*", viz.:

$$y^D = y^D(T, P) \tag{9}$$

where T is trust in tax authorities that symbolizes the "*voluntary tax compliance*" and $P \equiv \rho \cdot \varphi(e)$ is the power of tax authorities to detect and punish tax evaders that symbolizes the "*enforced tax compliance*". We expect that $\frac{\partial y^D}{\partial T} > 0$ and $\frac{\partial y^D}{\partial P} > 0$, since there is substantial agreement in the literature that trust (in) and power (of) tax authorities are both necessary to guarantee a high level of tax compliance (see, e.g., Kirchler et al., 2008; Muehlbacher and Kirchler, 2010).

Following the related literature (see, e.g., Halla, 2012), we use a proxy for tax non-compliance behavior, i.e. tax evasion, thus obtaining a general function for tax non-compliance behavior (e):

$$e = e(T, P) \tag{10}$$

in this case, of course, the expected signs of the variables are reversed, i.e., $\frac{\partial e}{\partial T} < 0$ and $\frac{\partial e}{\partial P} < 0$. As previously mentioned, empirical studies have often neglected the non-linear relation

between tax authority's two dimensions (trust and power) and tax compliance. Thus, the key hypotheses of the model are the following:

$$\frac{\partial^2 e}{\partial T^2} \neq 0 \text{ and } \frac{\partial^2 e}{\partial P^2} \neq 0$$

namely, the relationship between overall tax compliance (tax evasion) and voluntary tax compliance, as well as that between overall tax compliance (tax evasion) and enforced tax compliance, is non-linear (as suggested by the SSF). This would imply that an increase in power and/or trust above a certain critical level could significantly reduce tax evasion. Furthermore, it is possible to compare the effect of trust (in) and power (of) tax authorities in reducing tax evasion. In order to do this, we use a logarithmic model:

$$\ln e = \alpha \cdot \ln T + \beta \cdot \ln P \qquad (10')$$

It follows that if the coefficients (the elasticities) are greater than one (in absolute value, of course), viz.:

$$|\alpha| = \left|\frac{\partial \ln e}{\partial \ln \mathrm{T}}\right| > 1 \text{ and } |\beta| = \left|\frac{\partial \ln e}{\partial \ln P}\right| > 1$$

then a "slippery slope" situation occurs and, thus, trust (in) and power (of) tax authorities are both able to significantly reduces tax evasion. Also, by comparing the elasticities, it is possible to deduce whether trust is more effective than power (if $|\alpha| > |\beta|$) or the opposite (if $|\beta| > |\alpha|$). This would be a very important result for fiscal policy, since policy makers would know the right instrument to fight against tax evasion, thus increasing the declared income (the overall tax compliance y^D).

In order to capture the crucial interplay of trust and power, we construct an interaction variable $P \cdot T$. Therefore, the full model is the following:

$$\ln e = \gamma \cdot \ln m + \alpha \cdot \ln T + \beta \cdot \ln P + \delta \cdot \ln(P \cdot T) \qquad (11)$$

where it is also expected that $\delta > 0$, since the interaction between trust and power is crucial for reducing tax non-compliance behavior (see, e.g., Kirchler et al., 2008a; Muehlbacher and Kirchler, 2010).

Note that the model (11) is theoretically consistent with the following function:

$$y^D = T^{\alpha} \cdot P^{\beta} \cdot (P \cdot T)^{\delta} \qquad (12)$$

which implies that overall tax compliance is positive ($y^D > 0$) only if trust (in) and power (of) tax authorities are both positive ($T > 0$ and $P > 0$). In short, only power (or likewise only trust) is not able to significantly increase tax compliance, since a key factor for reducing (increasing) tax evasion (tax compliance) is to use the "right mix" of trust and power (see, e.g., Kirchler et al., 2008a; Muehlbacher and Kirchler, 2010).

Empirical studies show the existence of a strong negative correlation between the level of

tax morale and the extent of tax evasion (see Torgler 2005, for Latin America; Alm and Torgler 2006, for the U.S. and Europe; Alm et al. 2006, for several transition countries; Barone and Mocetti 2009, for Italy). Tax morale constitutes a widely accepted measure of intrinsic motivation to pay taxes (see, e.g., Torgler, 2007). However, a high level of tax morale does not necessarily imply a high level of (overall) tax compliance or likewise a low level of tax evasion, since tax morale, unlike tax compliance and tax evasion, does not measure individual behavior but rather individual attitude. Nevertheless, there is a potential reverse causality between actual tax compliance and taxpayers' attitudes (see, e.g., Halla, 2012): on one side, in fact, tax morale can decrease (increase) tax evasion (tax compliance); but, on the other side, a large tax evasion can reduce the individual attitude to compliance with tax rules (tax morale).[5] Hence, testing the relation between tax compliance/tax evasion and tax morale is not an easy task. For the sake of simplicity, therefore, we hypothesize a mere (negative) partial correlation between tax non-compliance behavior and the individual attitude to compliance with tax rules, thus introducing tax morale (m) into the model in a very simple way:

$$\ln e = \gamma \cdot \ln m + \alpha \cdot \ln T + \beta \cdot \ln P \tag{13}$$

with $\gamma < 0$, since, *ceteris paribus*, a more widespread tax morale should imply a higher tax compliance (a lower tax evasion). At the limit, in the absence of both trust ($T = 0$) and power ($P = 0$), a positive overall tax compliance is possible ($y^D > 0$) in the presence of a non-negligible tax morale ($m > 0$).

Finally, note that the introduction of equation (9) into the theoretical model changes the state's problem, thus affecting the taxpayer's rule, viz.:

$$max_\rho \{y^D(T, P(\rho), m) \cdot \tau + P(\rho) - \rho \cdot \vartheta\}$$
$$\xrightarrow{yields} \frac{dP}{d\rho}\left[\frac{\partial y^D}{\partial P} \cdot \tau + 1\right] = \vartheta \tag{14}$$

As a result:

1) $\frac{\partial y^D}{\partial P} > 0$, since the SSF postulates a positive effect of power on (enforced) tax compliance. Thus, the state's marginal benefit deriving from the increase in the monitoring rate is, *ceteris paribus*, higher;

However,

[5] Torgler and Schneider (2009) and Halla (2012) suggest instrumental variable approaches to deal with potential endogeneity problems. In particular, Halla (2012) discusses the causality issues and provides an interesting approach to address the endogeneity problem, thus showing evidence of a causal link of tax morale on tax evasion.

2) Too much power (many tax audits and rigorous penalties) may corrode the trust in tax authorities (Muehlbacher and Kirchler, 2010). Indeed, strong deterrence policies may eventually damage tax compliance (Tsikas, 2017). Also, Kastlunger et al. (2013) differentiate power into legitimate and coercive power and indicate a negative relationships between trust and coercive power.[6] Hence, we can assume that above a certain threshold value of power, power becomes coercive, thus reducing trust and tax compliance (y^D).

Moreover,

3) Indeed, when tax officials are respectful toward taxpayers (trust is higher), tax morale increases (Feld and Frey 2007). In this case, tax morale can be seen as a further determinant of voluntary tax compliance. This effect reinforces the previous effect, thus suggesting that too much power is not desirable. Obviously, $P > 0$, since the total absence of audits and penalties may cause distrust in the effectiveness and credibility of the tax authorities' work (Muehlbacher and Kirchler, 2010).

Considering that the hypothesis 2) is very difficult to test empirically, we aim at comparing the effect of trust, power and tax morale in reducing tax evasion. Concisely, if power is more effective than trust and tax morale, the state should neglect the hypotheses 2) and 3), thus enforcing a high power (high monitoring and penalties); vice versa, if trust and tax morale are more important than power, the state should aim at increasing the trust of taxpayers in their work, by improving services towards taxpayers and make them feel respected and heard.

4. Empirical analysis and results

By using data from several sources, we perform a pooled cross-section analysis (i.e., a cross-section analysis repeated over time). Following Halla (2012), the size of shadow economy as percentage of official GDP is used as a proxy for tax noncompliance behavior, i.e. tax evasion, thus estimating the opposite of overall tax compliance (source: Schneider *et al.*, 2010).

As in Fischer and Schneider (2009), tax morale is surveyed in the World Values Survey (WVS).[7] Unlike Fischer and Schneider (2009), however, we use tax morale as a (separate) determinant of voluntary tax compliance and, thus, of overall tax compliance. Fischer and

[6] Kaplanoglou and Rapanos (2015) found that power is perceived as legitimate only in high-trust conditions, while it is perceived as coercive in low-trust conditions.

[7] The World Values Survey (WVS) is an international database that includes information on a wide range of socio-demographic characteristics and personal attitudes of about 83,000 persons living in more than 73 countries.

Schneider (2009), instead, use tax morale as proxy for actual tax compliance. Indeed, tax morale could be used as proxy for voluntary tax compliance but not for actual tax compliance, since the latter also includes enforced compliance. In short, by equating tax compliance with voluntary tax compliance, the overall tax compliance could be overestimated. Tax morale is surveyed in the WVS with the following question *"Do you think it is justifiable to cheat on taxes?"*, with answers ranging from *"never justifiable"* (1-point-scale) to *"always justifiable"* (10-point-scale). In order to obtain that an increase in this scale implies an increase in tax morale, this index has been reformulated to lie in the interval [1, 10], where 10 indicates the highest level of tax morale, while 1 the lowest. Source: our elaborations on WVS data.

Since the decision on how to use tax revenue is made by the national government, we approximate trust in tax authorities with trust in government. Trust in government is surveyed in the WVS with the following question *"Could you tell me how much confidence you have in Government?"*, with answers ranging from *"a great deal of confidence"* (1-point-scale) to *"none at all"* (4-point-scale). In order to obtain that an increase in this scale implies an increase in trust, this index has been reformulated to lie in the interval [1, 10], where 10 indicates the highest level of trust, while 1 the lowest. Source: our elaborations on WVS data.

As regards the variable power of tax authorities, we follow the standard assumption that countries with a stricter rule of law are more likely to have well-functioning tax administrations and are most able to enforce tax laws (see, e.g., Fischer and Schneider, 2009). Hence, we use the popular governance indicator from the World Bank (Kaufmann et al., 2010), which can be used to assess the quality of government, as well as the power of authorities in general.

Finally, we account for country-specific characteristics both using country fixed effects (time invariant) and some socio-demographic controlling variables taken from the World Development Indicators database.[8] Of course, in the control variables, we also include the log of average GDP per capita (always taken from the World Development Indicators database) and a measure of the marginal tax rate constructed by the Fraser Institute (Gwartney and Lawson, 2002).

The empirical model is thus the following:

$$y_{i,t} = X\beta + Y\gamma + \alpha_i + \varepsilon_{i,t}$$

where:

$y_{i,t}$ = dependent variable (natural logarithm of tax evasion of a country i at year t);

X = vector of main explanatory variables (tax morale, trust and power);

[8] https://datacatalog.worldbank.org/dataset/world-development-indicators.

Y = vector of control variables (such as GDP and taxation);

β, γ = vector of regression coefficients;

α_i = country fixed effects (time invariant);

$\varepsilon_{i,t}$ = stochastic error term.

The fixed effects are able to capture other determinants of tax compliance (precisely, country-specific and time-invariant factors) without incurring the big problem of a correlation between explanatory variables and error term. Tables 1, 2 and 3 report the main results of the model, where t-statistics are reported in the parenthesis along with the statistical significance of each estimated coefficient. Because of potential reverse causality between actual tax compliance and taxpayers' attitudes, we interpret the estimated regression coefficients as partial correlations.

Table 1. Model Results ("Extended" SSF with tax morale)

Dependent variable: Ln(tax evasion)	
Explanatory variables:	**Estimated coefficients (elasticities)**
Ln(Trust)	– 1.2102 * (– 2.51)
Ln(Power)	– 0.2870 ** (– 4.14)
Ln(Trust * Power)	– 0.1125 $^{+}$ (– 1.98)
Ln(Morale)	– 0.0871 $^{+}$ (– 1.65)
Ln(GDP)	– 0.1295 ** (– 4.95)
Ln(Tax)	0.0393 (1.62)
R- squared overall	0.1806
Observations	69443
Number of countries	60

Notes: OLS regression with country fixed effects and clustering at the country level. All variables are in natural logarithm. ($^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$). Unlike tax morale and the interplay between trust and power, the effect of taxation on tax evasion is not even statistically significant at the 10% level ($p > 0.10$).

Table 1 shows the standard result that power and trust are both necessary for increasing tax compliance. Precisely, vertical trust and rule of law are statistically significant and the relation goes in the expected direction: an increase in vertical trust leads to a decrease in tax evasion, and the same is true for an increase in power. Much more interesting, trust exerts a larger effect on tax evasion than power. One of the key assumptions of the SSF is, in fact, the possibility that a reduction of power and/or trust below a certain critical level significantly reduces tax compliance, namely there is decreasing relationship (at increasing rates) between tax compliance and the reduction in power/trust. Precisely, the "elasticities" of the relation between tax authority's two dimensions (trust and power) and tax evasion (tax non-compliance behavior) show that a "slippery slope" situation emerges with respect only to trust: in fact, an increase in trust of 1% is associated with a decrease of 1.21% in tax evasion; whereas, an increase in power of 1% is associated with a decrease "only" of 0.29% in tax

evasion. Hence, this implies that only an increase in trust can significantly increases tax compliance (reduces tax evasion).

The individual attitude to compliance with tax rules (tax morale) could be seen as a further determinant of voluntary tax compliance, thus its contribution could be added to that of trust in tax authorities. It follows that the (total) elasticity of tax evasion with respect to voluntary tax compliance could be calculated as follows:

$$-1.2102 + (-0.0871) = -1,2973$$

Indeed, if tax morale is excluded from the analysis (see Table 2), the elasticity of tax evasion with respect to trust increases (–1.2492).

Table 2. Model Results ("Original" SSF without tax morale)

Dependent variable: Ln(tax evasion)	
Explanatory variables:	**Estimated coefficients (elasticities)**
Ln(Trust)	–1.2492 * (– 2.72)
Ln(Power)	– 0.2740 ** (– 4.76)
Ln(Trust * Power)	– 0.1224 + (– 1.88)
Ln(GDP)	– 0.1303 ** (– 4.85)
Ln(Tax)	0.0362 (1.51)
R- squared overall	0.1754
Observations	69443
Number of countries	60

Notes: see Table 1.

Instead, if trust is excluded from the analysis (see Table 3), tax morale becomes statistically significant. This confirms the result that voluntary tax compliance is more effective than enforced tax compliance in reducing tax evasion.

Table 3. Model Results (with tax morale and without trust)

Dependent variable: Ln(tax evasion)	
Explanatory variables:	**Estimated coefficients (elasticities)**
Ln(Power)	– 0.3012 * (– 2.69)
Ln(Trust * Power)	– 0.1108 + (– 1.81)
Ln(Morale)	– 0.0922 * (– 2.01)
Ln(GDP)	– 0.1258 ** (– 5.28)
Ln(Tax)	0.0374 (1.54)
R- squared overall	0.1429
Observations	69443
Number of countries	60

Notes: see Table 1.

Instead, testing the interplay of trust (in) and power (of) tax authorities on overall tax compliance is a very challenging task. Indeed, there is a legitimate power and a coercive power, as well as there is a reason-based trust and an implicit trust (see, e.g., Kastlunger et al., 2013; Hofmann et al., 2014; 2017). Thus, there is more than a potential interaction between trust and power.

Concisely, there are three main differences between the "original" SSF framework (Kirchler et al., 2008) and this extended version of the model:

- The (positive) effect of trust and power on overall tax compliance is not mediated by voluntary and enforced compliance. This because, empirically, tax authorities detect overall tax compliance (overall tax evasion).
- Tax morale could be seen as a further determinant of voluntary tax compliance.
- There is a "slippery-slope" situation only between tax compliance and the reduction in trust, i.e. only a reduction in trust can have a strong negative effect on tax compliance.

5. Conclusions and policy implications

This paper represents the first attempt to provide a theoretical integration and an empirical assessment of the two main strands of literature on the psychological and behavioral determinants of tax compliance, namely the "slippery slope" framework and tax morale. Precisely, we first introduce the costs and benefits of tax evasion in an economic model of taxpayer's decision and then the theoretical model is extended by introducing the relation among trust, power and tax morale. Afterwards, we develop an empirical analysis in order to substantiate the main theoretical results.

We find support for this extended version of the SSF framework, where tax could be seen as a further determinant of voluntary tax compliance. In particular, we point out that trust and tax morale are more effective than power in reducing tax evasion. Indeed, there is a negative relationship at increasing rate between tax evasion and voluntary tax compliance. Thus, only an increase in trust above a certain critical level could significantly increase overall tax compliance. Our results are consistent with a recent empirical analysis conducted by Tsikas (2017) for 25 European countries, where trust (independently of power) has a strong and significant influence on tax compliance, while the positive influence of power of tax authorities (independently of trust) is weaker and less robust.

Eventually, these results suggest that the enhancement of both taxpayers' trust in tax authorities and tax morale is the best tax strategy. However, as suggested by the SSF, this analysis also states that power of tax authorities is important for increasing tax compliance (the estimated regression coefficient is always positive and statistically significant).

In particular, the tax literature suggests that a combination of high trust and power leads to a maximum level of voluntary compliance (see, e.g., Kirchler et al., 2008a; Wahl et al., 2010; Muehlbacher and Kirchler, 2010). The key and non-trivial question is to identify the "right mix" of trust and power. The distinction between legitimate power and coercive power,

as well as the distinction between reason-based trust and implicit trust, in fact, make the implementation of this policy strategy even more difficult.

The best tax strategy could depend on the characteristics of taxpayers. Taxpayers, indeed, follow very different behavioral attitudes in paying their taxes (see Braithwaite, 2003): some of them may voluntarily pay their taxes as a contribution to society (honest taxpayers), while others enjoy tax evasion (tax evaders). Hence, tax evaders should be pursued and punished by tax authorities with full rigor of the law. Indeed, it would be necessary: (1) raising awareness of the power of tax authorities; and (2) giving a signal of respect towards honest taxpayers.

Obviously, establishing policy actions which increase tax morale and the degree of cooperation by taxpayers (voluntary tax compliance) is a very complex endeavor (for example, improving services towards taxpayers, thus making them feel respected and heard); whereas an increase in enforced compliance can be achieved by increasing the standard tools of deterrence, namely audits and penalty (Prinz, Muehlbacher and Kirchler, 2012). As a result, policy actions aim at increasing the mutual trust between tax authorities and taxpayers may not be very effective in the short-run (Halla, 2012). Also, tax morale is usually regarded as very slowly changing (Lindbeck and Nyberg 2006; Halla 2010).

Trust-building actions, therefore, are the most effective economic policies for obtaining long term positive effects. Indeed, there is a strong positive effect of education on trust in tax authorities (Kasper, Kogler and Kirchler, 2015). Education is closely related to human capital (see, e.g. Burgess 2016) and is able to weaken negative social phenomena as shadow economy, corruption and crime. Indeed, human capital spurs economic growth (see, e.g. Savvides and Stengos 2009), while shadow economy and economic growth are inversely related (see, e.g. LaPorta and Shleifer 2008). As a result, in a society where education and trust are higher, shadow economy and tax evasion are lower, while overall tax compliance and economic growth are higher.

Nevertheless, a simple way to spur voluntary tax compliance also in the short-run is to provide, at least initially, bonuses (tax rewards) for honest taxpayers. This suggestion is consistent with recent findings in experimental economics. Indeed, Mendoza and Wielhouwer (2015) and Dwenger et al. (2016) conclude that the best response to tax evasion might be the opposite to increasing deterrence, namely by incentivizing tax compliance through rewards for honest taxpayers. Eventually, we suggest a strategy based on rewards for honest taxpayers and a more efficient use of automated information exchange. Really, Alm and Soled (2016) argue that the technological change (precisely, automated information exchange) is able to stamp out tax evasion by fostering cashless economies and highest transparency.

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