

# Tax revenues collection within active and passive corruption regimes. Evidence from the Italian regional panel data

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## Abstract

This paper deals with the impact of passive (*corruzione*) and active (*concussione*) corruption, according to the assignment of bargaining power to taxpayers instead that to tax officials, on tax revenue collected in Italy at regional level in the 2003-2015 time span. Analysing single central tax items (Value Added Tax, Personal Income Tax and Corporation Tax), results highlight that central tax collected at regional level in Italy are mostly a matter of active more than passive corruption, which means that the extortive behaviour of tax officials may seriously harm the capacity to raise revenue in Italy. This result asks for a greater attention to the quality of tax administration.

**Keywords:** active corruption, passive corruption, tax revenues, revenue performance

**JEL code:** C33, D73, H71

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## 1. Introduction

There is plenty of evidence that corruption may seriously affect tax revenues (Gupta, 2007; Imam and Jacobs, 2014) and offset the triggering effect of taxation on economic growth (Aghion et al., 2016), both in developing countries and in industrialised ones.

When rents and monitoring failures characterize the citizens-government relationship (Lederman, Loayza, and Soares; 2005) there is room for corrupt tax administrators. The greater it is the discretionary power of the tax collectors; the more likely it is that they will be able to negotiate a bribe with taxpayers in order to reduce their tax burdens or to avoid unexpected and oppressive fiscal controls. This, in turn, undermines the trustworthiness and legitimacy of the tax authority, and thereby reduces compliance and increases the scope for evading taxes (Fjeldsand and Tungodden, 2003). Therefore, corruption ends up threatening the country's revenue performance. In the aftermath of the economic crisis, this threat is highly relevant not only for developing countries but also for developed countries where a slow turn of economic growth combined with uncontrollable public expenditures are so pressing that states are making great efforts to recover tax revenues by removing obstacles to an efficient tax administration and collection.

This is the case of Italy, where the revenue raised by taxation helps to satisfy the government's budget constraints: a possible bureaucrats' corrupt behaviour may thus jeopardise the efficiency of tax system, as well as of public spending.

It is no coincidence that today's news in Italy are dominated by several examples of corruption in tax administration, too. Some examples can help to clarify the present situation in this country. In Rome, an official of the Italian Revenue Agency was arrested for *corruzione* because, in accord with an accountant, he altered fiscal data of several taxpayers in order to reduce their tax burden in exchange for bribes.<sup>1</sup> In Genova, another official of the Italian Revenue Agency was arrested for *concussione* because he pocketed 30.000 euro by a wine-making company and other 5 taxpayers with the promises of not carrying out fiscal audits and to avoid reporting of irregularity or misalignments of declared revenues.<sup>2</sup>

Although both above examples refer to an illegal behaviour in tax administration, the underlying criminal law provisions in the Italian penal code differ, mainly depending on the nature of illicit agreement between public and private counterpart: collusive for *corruzione* and more extortive for *concussione*. These different crimes have been classified by Capasso and Santoro (2018) in two kinds of corruption regimes, according to the degree of bargaining power in the hands of public counterpart within a corruption agreement. The authors define *active corruption* (represented by the crime of *concussione*) the situation in which the bureaucrat has the greatest bargaining power by which he/she forces or induces the private agent to pay a bribe and set the level of the bribe at a maximum level. On the other hand, *passive corruption* (represented by the crime of *corruzione*) relates to the case in which the private agent has the greatest bargaining power and offers a minimum level of bribe to the corrupt bureaucrat. Following this classification, we are able to state that the first anecdote of corruption in tax administrator represents a case of *passive* corruption as the tax administrator "was requested" by the accountant to modify fiscal information of his clients, whereas the second story provides an example of *active* corruption as the official "threats" taxpayers in order to get a bribe.<sup>3</sup>

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<sup>1</sup> Il Messaggero, Wednesday 17<sup>th</sup> October 2018

[https://www.ilmessaggero.it/roma/cronaca/corruzione\\_arrestato\\_funzionario\\_agenzia\\_entrare-4045142.html](https://www.ilmessaggero.it/roma/cronaca/corruzione_arrestato_funzionario_agenzia_entrare-4045142.html)

<sup>2</sup> Genova Today, Monday, 17<sup>th</sup> April 2017

<http://www.genovatoday.it/cronaca/agenzia-entrare-arresto.html>

<sup>3</sup> In the current Italian scenario, a plethora of similar anecdotes really shows the same specific characteristics of the different bribing mechanism depending on the type of crime committed by the tax administrator. For the crime of *concussione*, tax collectors usually approach taxpayer to whom they extort a bribe through treating additional controls and illicit inspections or offering to reduce a tax penalty; for further anecdotes see for examples:

In this paper we join the discussion on the corruption-tax-compliance issue which has interested an increasing number of scholars (Bird et al., 2008; Imam and Jacobs, 2014; Timmons and Garfias, 2015; Baum et al., 2017; Liu and Mikesell, 2018 amongst others). As far as we know, all previous papers considered corruption as a monolithic feature even though scholars admitted that the relationship between taxes and corruption is “both complex and critical” (Evans, 2017; p. 140). In a recent technical document, the U4 Anti-Corruption Resource Centre (Transparency International, 2010) blames that “there is currently a great lack of empirical data and analysis examining the impact of taxation on corruption. More research needs to be done to better understand this relationship and to determine whether remedies to corruption can be found through taxation schemes”<sup>4</sup>.

We, thus, advance the literature by proposing a further differentiation between active and passive corruption. We test the effect of these two regimes of corruption on single tax revenue items in Italian regions in the 2003-2015 time span. Italy is an interesting case study, as corruption is perceived a widespread phenomenon in public institutions by 88% of respondents of the last 2017 Eurobarometer survey. Moreover, according to “Three-year plan for the prevention of corruption” released by the Italian Revenue Agency (2016), active and passive corruption as a whole represent 45.2% of crimes for which the tax personnel has been prosecuted in the last years under our investigation.<sup>5</sup>

In the light of the above considerations, this paper aims at investigating also the general effect of corruption on single tax revenue items, as well as the effect of the two different corruption regimes.

The paper is organized as follow. The next section summarises the existing literature on the relationship between corruption and tax revenues and shows the main hypothesis to be tested. Section three describes the empirical strategy, while the results are discussed in section four. Section five contains some conclusions and implications.

## 2. Literature review

It is widely acknowledged that tax effort is not only a matter of ‘supply factors’ (such as tax handles) but also of ‘demand factors’ which, by affecting the level of institutional quality, shapes the vertical relationship between taxpayers and the State (Bird et al., 2008). In particular, the presence of corruption, meant as “the sale by government officials of government property for personal gains” (Shleifer and Vishny, 1003, p. 599) harms tax compliance and promotes tax evasion because “undermines the trust in government and the compliance with tax laws” and, at the same time, “fosters the development of the informal sector, and therefore erodes the potential tax base” (Baum et al., 2017; pp. 191-192).

Fiscal contract theories predict that the relationship between citizens and their governing authority can be modelled in terms of fiscal contracts concerning the exchange between public goods and tax paid in line with the benefit principle of taxation (Feld and Frey, 2007; Kirchler et al., 2008). As this relationship is characterized by significant asymmetries of information, any factor producing a “disconnect between what citizens expect from government and what they are willing

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<https://www.ilfattoquotidiano.it/2014/07/29/roma-intascavano-mazzette-da-8mila-euro-arrestati-due-finanzieri/1076261/>  
<https://www.ilrestodelcarlino.it/ascoli/cronaca/agenzia-delle-entrate-arresto-funzionario-1.2087225>

For the crime of *corruzione*, tax inspectors usually collude with taxpayer (and also possibly through with accountants or lawyers) in an more organised manner in order to reduce his/her tax bundle or liability; for further anecdotes see for examples:

<http://www.veneziatoday.it/cronaca/corruzione-agenzia-entrate-venezia.html>

<http://www.agrigentonotizie.it/cronaca/telefonate-operazione-duty-free-agenzia-entrate-agrigento-10-dicembre-2015.html>

<sup>4</sup> <https://www.u4.no/publications/exploring-the-relationships-between-corruption-and-tax-revenue>

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<https://www.agenziaentrate.gov.it/wps/file/Nsilib/Nsi/Agenzia/Prevenzione+della+corruzione/Piano+triennale+di+prevenzione+della+corruzione/Piano+di+approvazione+-piano+anticorruzione+2016+2018/PTAC+2016-2018+def.pdf>

to pay” (Ebdon and Franklin, 2006; p. 444) harms fiscal legitimacy and political accountability and may induce a possible non-compliant behaviour in taxation (Bird et al., 2008). If taxpayers perceive that the level of public benefits relative to their contribution is unfair, their trustworthiness and confidence in government and in state officials shrinks and there is room for fiscal corruption to appear (Timmons and Garfias, 2015).

Moreover, delegation of authority to tax officials and monitoring failures of the activity of these tax officials are the reasons behind the insurgence of administrative corruption in taxation (Flatters and Macleod, 1995). However, the influence of corrupt administrators on tax revenue capacity is potentially two-fold: on the one hand, collusion between corrupt tax collectors and evasive taxpayers serves to exchange reduction in tax liabilities for bribes (Flatters and MacLeod, 1995). On the other hand, the opportunity to collect bribes along the collection process may incentive corruptible tax collectors to monitor taxpayers more intensively in order to extract bribes: this makes the choice of evading taxes costlier to taxpayers which results in a lower level of tax evasion and a higher level of tax collection (Flatters and Macleod, 2005; Liu and Mikesell, 2018). Several factors encourage or facilitate corruption in tax revenues administration, such as low wages of tax inspectors (Aidt, 2003), lack of transparency and auditing on the activities of tax collectors (Tanzi, 1998) and negligible penalties that do not provide public dismissal for corrupt tax inspectors and criminal charges (Tanzi and Davoodi, 1997).

Literature exploring the effects of corruption on state’s capacity to raise tax has primarily dealt with the case of developing countries and economies in transition (e.g. Ghura, 1999; Gupta, 2007; Thornton, 2008; Ajaz and Ahmad, 2010; Potanlar et al., 2010; Besley and Persson, 2014; Imam and Jacobs, 2014; Timmons and Garfias, 2015; Schlenker, 2017; Arif and Rawat, 2018). A more recent stream of literature has provided evidence of the corruption-tax nexus also in developed countries (Bird et al., 2008; Imam and Jacobs, 2014; Baum et al., 2017; Liu and Mikesell, 2018).

Hwang (2002) performs a cross-country analysis on 41-66 countries and finds that corruption negatively affects total government revenue as well tax revenue while the effect of corruption on taxes on international trade is positive.

Bird et al. (2008) observe that corruption as well as voice and accountability positively affect tax efforts in both their developing and high-income countries sample for the years 1990 to 1999.

Baum et al. (2017) study the effect of corruption on state’s capacity to raise revenues from different sources in a sample of 147 countries in the 1995-2014 time interval. They find that corruption is negatively associated with overall tax revenue, and most of its components. More in details, the personal income tax (PIT), Value added tax (VAT), social security contributions, and trade taxes exhibit a negative relationship with corruption while the relationship between corruption and corporate income tax is found to be positive.

Imam and Jacobs (2014) show that the effect of corruption reduces revenues collected in Middle Eastern countries. Moreover, they also find that taxes requiring frequent interactions between tax authorities and individuals, such as taxes on exports, customs and other import duties and international trade taxes as well as taxes on excise and on specific services are also negatively and statistically significantly affected by corruption.

Liu and Mikesell (2018) examine how corruption affects the level and composition of tax revenues in the U.S. state and local governments over the period 1997-2013. They find that a state with a higher level of corruption is likely to have a more complex tax and it is more likely to collect tax revenues from indirect taxes while negative association is found between corruption and the tax revenue levied by businesses.

However, while some scholars try to provide deeper analyses by disentangling the possible different effect of corruption according to different types of tax, as far as we know, there is a lack of

papers exploring the effect of different corruption regimes on tax revenues<sup>6</sup>, as well as the relationship between general corruption and tax revenues in Italy. Furthermore, previous works consider corruption as a monolithic phenomenon and this could be the reason underlying the contradictory results arising in the literature about the effect of corruption on tax revenue performance.

In order to fill the above mentioned research gaps and shed light on the extant nuanced evidence in the literature, we follow the approach adopted by Capasso and Santoro (2018) and assume that in the tax administration may occur two opposite regimes of corruption depending on which counterparty has the greatest bargaining power. In fact, at the origin of administrative corruption there is a system of fiscal laws and procedures that entails an outright discretionary power in collecting taxes that, in turn, favours tax collectors to extract bribes from taxpayers (Imam and Jacobs, 2014). Consequently, a high level of discretion in tax system may determine a greater bargaining power in the hands of tax collectors within a corruptive agreement with taxpayers to underrate tax liabilities fraudulently. As suggested by Aidt (2003), the higher it is the bargaining power of tax collector, the higher it is the bribe paid by the taxpayer<sup>7</sup>: but what is the specific effect of different kinds of corruption on the amount of tax revenues collected? In the light of these arguments, the two main hypotheses to be tested in this paper are the following:

Hypothesis 1: What is the general effect of corruption on the amount of tax revenues collected?

Hypothesis 2: Is the bargaining power of tax collector relevant in determining a different (dampening) effect of corruption on revenues performance? Alternatively, do active and passive corruption differently affect the amount of tax revenues collected?

We assume that the two above regimes of corruption negatively influence the amount of tax revenues collected but through different mechanisms and with a different magnitude. Therefore, we expect a different dampening effect of the two corruption regimes on the revenues performance.

Taking into account the Italian anecdotal evidence, active corruption usually refers to the case of extortion. As suggested by Hindriks et al. (1999), "...the tax inspector can report, or threaten to the taxpayer that he will report, a taxable income higher than the true" (p.396). Along these lines, the threat is supposed to induce the taxpayers to pay a bribe in order to prevent illicit and oppressive audits aimed at over-reporting their tax liability (fraudulently). The process is top-down as the inspector with the greatest bargaining power selects the taxpayers for a threatening audit. In this case, taxpayers are not necessarily non-compliant or prone to tax evasion as they may also "be victims, injured by the power invested in corruptible tax collectors" (Hindriks et al., 1999, p. 405) and thus, their decision about revenue misreporting is more likely to happen as an *ex post* choice as a consequence of the audit. The effect on tax revenues collection is supposed to be greatly negative as the "extorted" taxpayer (who is not necessarily tax evader) will be induced to report a level of income that is lower than the true one because he/she tries to offset the amount extorted through the bribe paid. At aggregate level, the *extortive bribing* undermines the taxpayer-government relationship with negative effect in terms of trustworthiness and perceived fiscal legitimacy toward tax authority. Both at micro and at macro level, it is as if active corruption generates new tax evasion and, thus, a further reduction of tax revenues through forcing or inducing also the honest taxpayers to underreport their tax liability.

In the case of passive corruption, the tax administrator is captured by evasive taxpayers (or by their tax consultant), which are unwilling to be compliant and, thus, adopt corruptive strategies in order to pay less taxes by bearing the cost of a bribe. Following Aidt (2003), this is the case of corrupt tax official that colludes with taxpayers to understate their tax liabilities with the result that revenues collected are less than the effective amount due. In this case, the process is bottom-up and collusion arises because there is scope for misreporting, as the taxpayers with the greatest bargaining power are

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<sup>6</sup> Previous literature has acknowledged the difficulty and variability in measuring corruption by providing estimations with different corruption indices (See Baum et al., 2017 for a synthesis).

<sup>7</sup> However, as suggested by Blackburn (2012) the corrupt tax collector generally ask for a bribe slightly lower than the tax saving for taxpayer in order to enable him to accept the bribe.

liable. Compared to active corruption, passive corruption is thus supposed to less negatively affects the level of collected taxes, since this *collusive bribing* mainly arises in a context already characterized by the presence of evasive or elusive taxpayers which are more likely to have already undertaken an *ex ante* decision about misreporting of their revenue. Passive corruption is thus expected to appear less relevant in explaining the amount of tax revenues collected as these latter would not be further jeopardised.

### 3. Empirical strategy and data

This section explains the estimation strategy and the methodology adopted to investigate the issues and hypotheses raised in the above discussion. It also describes the data employed to perform the empirical analysis and shows some preliminary evidence.

#### 3.1. Estimation strategy and methodology

In order to test the two above discussed hypotheses, we estimate various panel regressions of the general form

$$Y_{i,t} = \alpha + \beta CORR_{i,t} + \gamma X_{i,t} + f_i + \varepsilon_{i,t}$$

where  $i$  and  $t$  refer, respectively, to the twenty Italian regions and the 2003-2015 time span.  $Y_{i,t}$  is the revenue collected at regional level and it is alternatively represented in the econometric specifications by the main items of Italian general government taxes: Total Central taxes; Personal income tax (IRPEF); Value added Tax (IVA); Corporate income tax (IRES);.  $CORR_{i,t}$  represents either general corruption, or active and passive corruption.  $X_{i,t}$  is a vector of control variables,  $f_i$  and  $\varepsilon_{i,t}$  are country-fixed effects and the error term, respectively. The focus of the analysis is on the coefficient  $\beta$ , which captures the effect of the corruption rates (per 100,000 inhabitants) on the tax revenues performance. According to some previous evidence (Thornton, 2008; Imam and Jacobs, 2014; Timmons and Garfias, 2015, among the others), we generally expect a negative sign for this estimated coefficient. However, the key contribution of this paper is to test whether a different bargaining power in the corruption agreement reduces revenue of different tax items. For this purpose, we further disentangle general corruption in two regimes, active and passive, and estimate their effect on each of the main items of Italian taxes, separately.

The control variables included in each specification are those widely employed in the literature on this topic (see e.g. Bird et al., 2008; Ajaz and Ahmada, 2010; Imam and Jacobs, 2014).

First, we include the log-transformed *real gross domestic product (GDP)* as a proxy for the level of economic development that should rise the tax revenues share (Tanzi, 1992). In fact, a higher regional income ends up increasing the tax liability, as well as improving the capacity to collect taxes (Bahl, 1971; Chelliah, 1971). Therefore, we generally expect a positive effect of this variable on the level of tax revenues collected.

Second, we control for the level of *economic backwardness*, expressed as share of agricultural value added on the total GDP, in order to take into account for the sectoral composition of domestic product. As suggested by Ajaz and Ahmada (2010), agricultural activities may be difficult to tax, especially in poorer or backward regions where the agriculture sector represent a subsistence activity mainly conducted by small family farms. Moreover, some scholars (Bird et al., 2008) argue that a plethora of agricultural activities is generally exempted from taxation for political reasons, and that is what is really going on in Italy through the agricultural development policies (Cristofaro, 2017). Consequently, the economic backwardness (a higher agriculture share on GDP) should generally reduce revenue performance.

Third, we include among the regressors a measure of *trade openness* in order to control for the region's exposure to the international trade. As suggested by Bird et al. (2008), taxes on trade should be easier to collect than personal income taxes and, thus, the revenue performance should increase with a larger international trade sector. Moreover, as suggested by some scholars (Rodrik, 1998; Tanzi, 2004), a greater internationalisation requires a wider role of government in the economy as guarantor of the international business and this, in turn, entails a closer monitoring of the taxable economic activities. Therefore, we generally expect a positive effect of trade openness on revenue performance.

Fourth, we use the *inflation* to measure the effect of macroeconomic policies. The effect of inflation on tax revenue depends on how the tax system is adjusted for inflation. As highlighted by Tanzi (1977) a high inflation may erode the value of tax obligations and thus lower revenues performance in the presence of longer lags in tax collection and a poor elasticity in tax system. Moreover, the effect may vary according to the different type of tax, according to the tax design and related adjustments to offset the effects of inflation. The expected sign is thus ambiguous.

Finally, we include a *time trend* variable to account for the growing trend of tax revenues over time and avoid spurious correlation problem (Wooldridge, 2012, p.366).

In order to check the reliability of the estimates obtained through the equation (1), the basic econometric model has been also estimated through adopting the generalised method of moments (GMM), that has been widely adopted by previous studies on this topic also (e.g. see Gupta, 2007; Ajaz and Ahmad, 2010; Baunsgaard and Keen, 2010; Imam and Jacobs, 2014).

More specifically, we employ a system – GMM model, introduced by Arellano and Bover (1995) and fully developed by Blundell and Bond (1998) that allows us to avoid possible endogeneity bias through treating the model as a system of equations in first-differences and in levels. The endogenous variables in the first-differences equation are instrumented with lagged values of their levels, whereas the endogenous variables in the levels equation are instrumented with the lags of their first differences. According to Roodman (2009), the main concern is that the set of potential instruments conveys all sufficiently lagged variables, which exponentially increase with the number of times. However, an excessive number of instruments may lead to an over-fitting of the instrumented endogenous variables and, thus, lowers the consistency of the GMM estimators. In order to use a lower number of instruments, the first suitable lag of the explanatory variables is adopted, and the instrumental variables set is collapsed.

As a further robustness check, we also estimate the equation (1) through the two-step GMM estimator that produces more asymptotically efficient estimates of the coefficients. Furthermore, this technique generates consistent estimates of the standard errors robust to both heteroscedasticity and intragroup correlation, through adopting a finite-sample correction to the two-step covariance matrix (Windmeijer, 2005).

The use of system-GMM and the two-step variant allows us to avoid serial correlation and heteroscedasticity of the errors. Along these lines, the Hansen (1982) J-test of over-identifying restrictions is applied to control for the exogeneity of instruments. Finally, the Arellano and Bond (1991) test is employed in order to control for serial correlation of residues up to the second/third order and, then, avoid bias in the coefficients and in the robust standard errors estimated. Usually, this test confirms the absence of serial correlation starting from the second order only, since the first differences entail serial correlation of the errors of the first order processed.

### 3.2. Data description and preliminary evidence

As shown in table 1, a multiple set of sources has been employed to collect data that allow performing the econometric analysis for a panel of 20 Italian regions in the time span 1991-2015.

Selected single tax items are: Personal Income Tax (PIT), Corporate Income Tax (CIT) and Value Added Tax (VAT) whose revenues are managed by the general government and that represent

around 70% of all taxes collected at central level, according to our latest data (2015)<sup>8</sup>. Such revenues are also highly variable by region, given their wide heterogeneity in terms of population and economic activities. Therefore, we take this heterogeneity into account by including the log transformations of tax revenues as dependent variables. In this way the estimations will not be biased by a size effect, and the resulting coefficient will be comparable both by region and by type of tax.

The Italian national institute of statistics (Istat) provides the judicial data on corruption-related crimes in the Criminal justice statistics yearbook. These data have been widely used in previous empirical studies on corruption in Italy (Del Monte and Papagni, 2001, 2007; Acconcia and Cantabene, 2008; Alfano et al., 2013) but in an aggregated form that conveys several crimes against the Public Administration (Book II, Title II of the Italian Penal Code). In this aggregate, in addition to the specific crimes of corruption, other crimes against the public administration have been also included, such as embezzlement and misappropriation. For these crimes, there is no prediction of an agreement between a bureaucrat and a private agent that represents an essential characteristic of corruption.

In contrast to the above studies and following the classification proposed by Capasso and Santoro (2018), this paper employs regional data from the Criminal justice statistics yearbook (Istat) concerning the complaints for specific crimes of *concussione* (Article 317 of the Italian Penal Code) and *corruzione* (an aggregate of Articles 318-320 of the Italian Penal Code). These crimes are well suited to the hypothesis of a different bargaining power between taxpayer and tax collector in a potential corruption agreement underlying the phase of tax payment or fiscal inspection. The article 317 proxies for *active corruption*, since it punishes the public official that “forces” or “induces” somebody to pay a bribe, whereas the articles 318-320 represent *passive corruption*, since they punish the public official “only for receiving” a bribe. Instead, *general corruption* is measured as the sum of the article 317 that punishes the bureaucrat only and the article 321 that punishes the private counterpart of a corruption agreement only.

In order to allow a comparison among the widely different 20 Italian regions, data related to the total number of crimes reported in a given year for the three kinds of corruption activities are expressed per 100,000 inhabitants. Data on the annual resident population at 31 December are retrieved from the archives of Demographic Statistics (Istat). Data referring to GDP (both at constant and current prices) and Value Added resulting from agricultural activities (Nace Rev2) are retrieved from the Archive of the Regional Economic Accounts (Istat). From the same database are retrieved data to calculate the variable Trade Openness, defined as the sum of import and export as share of GDP, and the Inflation rate, obtained through the GDP implicit deflator.

**[Please, attach Table 1 here]**

Figure 1 shows the annual average of active and passive corruption and the log of tax revenues in Italy, in aggregate and by type of tax. We can observe that, while at the beginning of the sample period passive corruption was higher in magnitude than active corruption, the reverse is true for the rest of the period since 2006. This means that phenomenon of corruption in Italian bureaucracy has evolved over time by assuming a more aggressive nuance which might culminate in extortive bribes which means also that the taxpayers-official relationship has changed by assuming a more hierarchical characterization in which the official possesses the greatest bargaining power.

while Figure 2 shows the regional average of active and passive corruption and the log of average tax revenues by region in the timeframe considered. At a first sight, there are hints regions where lower revenues correspond to high levels of corruption (e.g. Molise), and regions where low levels of corruption come together with high revenues (e.g. Piemonte).

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<sup>8</sup> See table 1 for details on tax data sources.

Figure 3 plots the regional averages of corruption and central taxes revenues. The dashed line represents a linear fit between the variables. Here the hints of a correlation between corruption and taxes revenues is quite evident for general and active corruption, while it is less pronounced for passive corruption. This preliminary evidence calls for a more detailed analysis, performed in the next section.

#### 4. Results

Table 2 reports the results of the first set of panel regressions, which include the log of central taxes revenues – aggregate and by type of tax – as dependent variable and general corruption as a main variable of interest. The coefficients estimated by means of the three different estimation methods (fixed effects, system GMM and 2-step GMM) for each dependent variable are reported in each column. The expected negative effect of general corruption on tax revenues does not seem straightforward. Indeed, the coefficient associated to general corruption is negative and significant in the fixed-effects estimation for aggregate central taxes, PIT and CIT, while it is not significant in any of the GMM and 2-step estimation, which are robust to endogeneity. Therefore, despite some hints of robust correlation between general corruption and tax revenues, it would be hard to take strong conclusions from such estimations.

**[Please, attach Table 2 here]**

Following Capasso and Santoro (2018), we replace general corruption with active and passive corruption and replicate the estimations, whose results are reported in Table 3. As expected, the outcomes are considerably different from the first set of specifications. This comforts the intuition about the need of operating a distinction between active and passive corruption regimes. In fact, active corruption shows a strong negative effect on aggregate central tax revenues in almost all the specifications. This result is in line with our expectations, and it provides empirical support to the idea that extortive bribes will induce taxpayers to underreport their incomes and undermine the taxpayer-government relationship.

Passive corruption is, instead, statistically undistinguishable from zero in all estimations, except in the case of the fixed-effects regression on PIT revenues, where the coefficient is positive and significant. We explain this result in the light that passive corruption arises when taxpayers are already prone to evasion and are willing to report a lower income: for this reason no effect on tax revenues can be found as it is supposed to condition the ex-ante decision concerning the proportion of declared revenue. To verify this intuition, we should control for the effort to curb tax evasion at regional level. Unfortunately, data on tax evasion (or even proxies) for single type of tax at regional level are not available from the Tax Authority (Agenzia delle Entrate).

By examining the results for each type of tax, starting from aggregate tax revenue, as shown in the first column of Table 3, GDP has a positive and statistically significant coefficient. Instead, economic backwardness does not seem to affect aggregate revenues, as its coefficient is not statistically different from zero. Trade openness shows a surprising negative sign in the fixed-effects estimation, however neither the sign nor the significance hold in the endogeneity-robust estimations. Inflation has a positive and significant coefficient in all the specification, meaning that an increase in the price level is associated to a higher aggregate tax revenue. The coefficient for active corruption ranges from -0.026 in the fixed-effects estimation to -0.053 in the GMM estimation. Since the dependent variable is expressed in logarithmic scale, we can read these coefficients as a percentage variation of aggregate central taxes

due to an increase of active corruption. Therefore, we can assess the effect of an average within standard deviation increase (0.35) of active corruption in a loss of aggregate tax revenues from 0.9% up to 1.8%. Instead, the coefficient associated with passive corruption does not reach statistical significance in any of the estimations.

**[Please, attach Table 3 here]**

The results of the estimation for personal income tax (PIT) are printed in the second column. GDP is robustly associated with higher revenues from personal income tax, while economic backwardness shows a negative sign. This result has to be read in light of the preferential fiscal treatments that agricultural incomes benefit from, which in turn erode fiscal revenues. Trade openness does not have an impact on the personal income tax revenues, and neither has inflation. Active corruption is again negative and significant in all the specifications, and its coefficient are very similar in magnitude to those of aggregate revenues (the values of the coefficients are -0.026, -0.055, -0.054 in the fixed effect, GMM and two-step regression, respectively). Therefore, we find strong evidence of a negative effect of extortive corruption on personal income tax since a one unit increase in active corruption causes a loss of aggregate tax revenues which can reach 5.5%. On the other hand, in the fixed-effects estimation passive corruption is associated with a positive and statistically significant coefficient (0.013). However, the coefficient becomes negative and not statistically significant in the more robust specifications, which comforts the idea of passive corruption arising right before the taxes are paid .

VAT is an indirect tax, thus the results show a quite different pattern from the other types of taxation. The third column of Table 3 reports the outcomes. In all the estimations, GDP is associated to a positive and significant coefficient. Economic backwardness and trade openness are not significant in any of the estimations, while inflation shows a positive and significant coefficient as VAT revenues are easily adjusted for inflation. Our analysis shows some hints of an effect of active corruption on VAT revenues, which has a negative and significant coefficient in the fixed-effects (-0.025). However, since the result does not hold in the system-GMM estimations and the 2-step model we cannot draw a conclusive evidence from the analysis. The same conclusion applies for passive corruption, which is never significant, regardless of the estimation method. In general, Value Added Tax seems to be less sensitive to corruption, a result which is opposite to the one found in Liu and Mikesell (2018). In our case, as the underlying logic of the two regimes of corruption is the distribution of the bargaining power and not the phenomenon of fiscal illusion, we can explain this result in the light of the structure of the VAT tax which is ultimately borne by the final consumer which can evade it only by corrupting the seller. In other words, the presence of corruption in the VAT process, if any, is internal and concerns the persons involved in the different transactions and less frequently the administrative authority.

The last column reports the results for the corporation tax (CIT). Again, GDP shows a positive and statistically significant coefficient. Economic backwardness results in a negative and significant coefficient, meaning that a higher agriculture share reduces CIT revenues. Again, this could happen both because agricultural activities are difficult to tax and because of the agricultural development policies which promoted a preferential tax treatment for this sector. On the other hand, trade openness is positive and significant. That means that the higher it is the level of international trade the higher they are revenues from corporation tax: this is especially true in the last years, given the growing importance of multinationals and the increase in cross-border capital movements. . The coefficient of inflation is not statistically different from zero. Active corruption has a negative sign and a statistically

significant coefficient in all the specifications, suggesting that the revenues from CIT are strongly undermined by extortive corruption. The effect is estimated to be up to 7 times the magnitude of the same coefficient for PIT. Therefore, we find strong evidence that extortive bribes affect revenues from the corporation tax far more than revenues from personal income tax. This result confirms Liu and Mikesell's (2018) findings and can be interpreted in the light of Alm et al. (2016) who demonstrate that corruption and firm tax evasion are intertwined and self-reinforcing. As the effect concerns active corruption, (passive corruption does not reach statistical significance), our findings confirm that the quality of tax administration plays a great role in conditioning tax compliance at firm level.

Summing up the results, we show that a higher GDP is unsurprisingly associated with higher tax revenues. Economic backwardness is associated with lower revenues from personal income tax and tax on societies. On the contrary, trade openness fosters the revenues from corporation tax. Inflation increases the revenues from IVA. Active corruption negatively affects revenues from personal income tax and corporation tax. Passive corruption does not seem to have an effect on any type of revenues. In conclusion, our empirical analysis suggests that the distinction between active and passive corruption regimes is useful for disentangling the relationship between corruption and tax revenues. In fact, while the specification including general corruption measured as a whole does not provide any conclusive evidence, dividing corruption between active and passive provides evidence of a substantial difference between the two regimes. In fact, active corruption is shown to undermine aggregate tax revenues and direct tax revenues – both the progressive tax on personal income and the proportional tax on societies, while passive corruption does not seem to have a significant effect on the aggregate and disaggregate central tax revenues.

We advance the literature by showing that the effect of corruption on citizens' and firms' tax revenue is mostly a matter of tax inspectors' bargaining power. A predatory behavior by tax officials may seriously undermine the governments' ability to collect taxes, hence the selection of honest civil servants must be a priority for the tax authority. On the other hand, the collection of VAT taxes seems to be less exposed to tax administrators' corrupt practices (as well as to control). This results contradicts what found in previous literature (Liu and Mikesell, 2018, Baum et al., 2017) as, in our case, it concerns goods and markets for the internal market where the consumer is the one who borne the tax. While VAT non compliance is a great problem in Italy, strategies to reduce the tax burden mostly include omitted invoices or incomplete bookkeeping which are implemented regardless of the tax inspector, who finds difficult to perform a verification work given the time lags related to the annual (nor monthly or quarterly) VAT communication in Italy.

## **5. Conclusions**

Tax revenue performance is a compelling issue in Italy. In this work we show that this phenomenon is likely to be closely linked with corruption of public officials. Moreover, we show that the effect of corruption on tax revenue is conditioned by the type of corruption regimes. Following Capasso and Santoro (2018) we define active and passive corruption depending how the bargaining power when defining the bribe is assigned. When the bargaining power is in the hand of the public official we observe active corruption – i.e. extortive bribes – whereas when the bargaining power is in the hand of the private counterpart we observe passive corruption.

Our analysis shows that active corruption undermines tax revenues, in particular personal income tax and corporation income tax, while passive corruption does not. The extent of this effect is statistically robust to a number of specifications and economically sizable, as a standard increase of active corruption is estimated to reduce aggregate central tax revenues by about one percent. Furthermore, we find that revenues from tax on societies are undermined more severely than revenues from tax on personal income. We hypothesize that there are two channels that link active corruption and tax

revenues: on the one hand, public officials who have a great amount of bargaining power extract the higher bribe possible, which in turn reduces tax payments. On the other hand, extortion by public officials undermines the trust relationship between citizens and the state, resulting in a lower tax morale and a higher propensity to evade taxes. On the contrary, we hypothesize that passive corruption is more likely to happen when the taxpayer is already noncompliant, which means that the bribe does not further reduce tax revenues. Further research will deepen this argument by focusing on the effect of corruption regimes on tax non-compliance by employing tax gap data, if the Tax authority will make them available for single typology of taxes.

Our results fill a gap in the existing literature, and suggest that more attention has to be paid to the bargaining power as well as to the selection of public officials. In line with Kastlunger et al. (2013)'s findings which show that tax compliance in Italian regions depends on the types of power of the authorities, the relevance of corruption in tax bureaucracy shows that the distinction between legitimate and coercive power may be subtle and asks for a redesigned system of internal checks and balances in order to be contained. Involving local government in the effort against corruption in tax collection under a single comprehensive strategy could be also a relevant solving option. A recent OECD document (OECD, 2016) underlines all these issues and it recommends the need of a stronger coordination across the different institutions involved in tax administration for improving tax compliance with a clearer definition of roles and responsibilities. Moreover, the document suggests to redesign the incentives provided to the revenue agency staff by linking them to voluntary compliance rather than to collected revenue.

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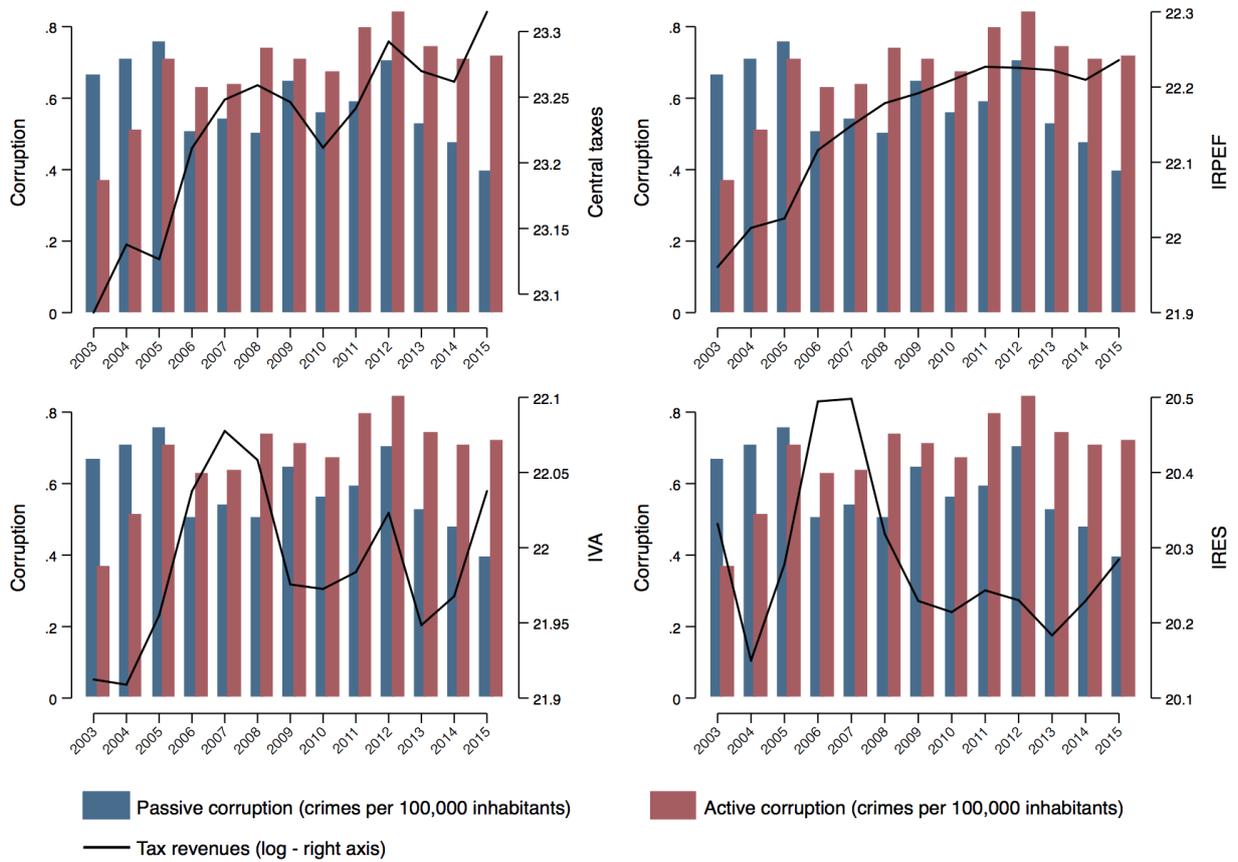
## Appendix

**Tab. 1 - Variable definition, source and summary statistics**

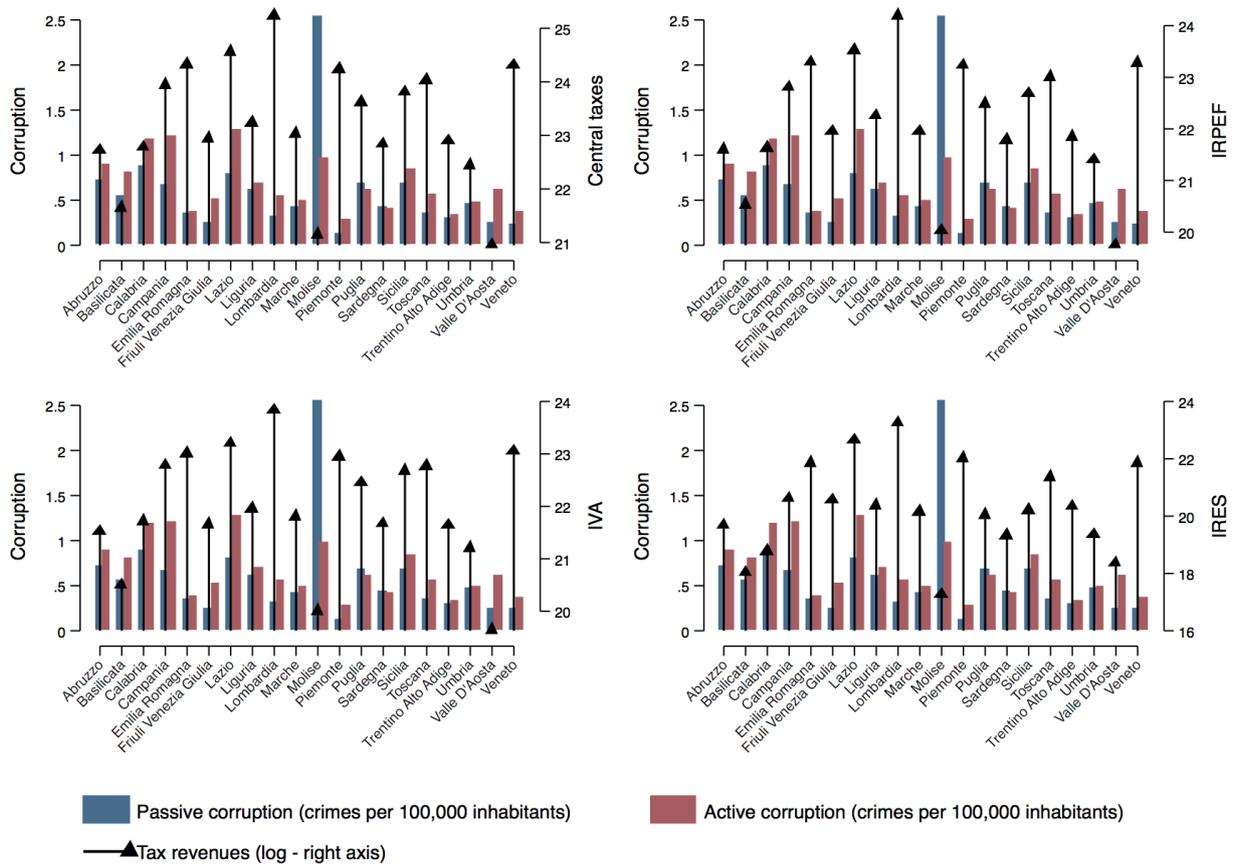
Description	Sources	Variable name	Obs.	Mean	Std. Dev.	Min	Max
Natural logarithm of tax revenues collected by fiscal administration in each region. All value at current prices (%).	Italian Ministry of Finance (MEF) and Conti Pubblici Territoriali (CPT)	<b>- Central tax</b>	260	25.56606	1.675278	21.196	32.156
		<b>- PIT (IRPEF)</b>	260	8.771938	0.866508	6.529	10.487
		<b>- VAT (IVA)</b>	260	7.451304	0.656538	5.888	9.685
		<b>- CIT (IRES)</b>	260	1.662188	1.054763	0.369	4.696
Number of crimes reported for artt. 318 and 320 of the Italian penal code per 100,000 inhabitants.	Criminal justice statistic yearbook (Istat)	<b>Active corruption</b>	260	0.582634	0.609826	0	4.69509
Number of crimes reported for artt. 318-320 of the Italian penal code per 100,000 inhabitants.	Criminal justice statistic yearbook, (Istat)	<b>Passive corruption</b>	260	0.675418	0.49475	0	3.11655
Number of crimes reported for artt. 317 and 321 of the Italian penal code per 100,000 inhabitants.	Criminal justice statistic yearbook (Istat)	<b>General corruption</b>	260	1.006253	1.146954	0	13.55586
Natural logarithm of per capita GDP at real prices (2010=100) in euro, using population at 1st January.	Archive of the Regional Economic Accounts (Istat)	<b>Real per capita income</b>	260	10.14521	0.265663	9.635266	10.53565
Share of Value Added of agriculture in total GDP. All value at current prices (%).	Archive of the Regional Economic Accounts (Istat)	<b>Economic Backwardness</b>	260	2.59807	1.300969	0.86029	5.98505
Trade openness as ratio of export and import values on total GDP. All value at current prices (%).	Archive of the Regional Economic Accounts (Istat)	<b>Openness</b>	260	33.89842	15.88855	2.66203	67.83927
GDP deflator, measured as the year variation between nominal and real GDP.	Archive of the Regional Economic Accounts (Istat)	<b>Inflation</b>	260	1.77132	0.979403	-2.62532	4.409

**Note:** The total regional amount of central taxes as well as VAT (Value Added Tax) revenues are drawn from *Conti Pubblici Territoriali* (CPT) - cash based database released by the *Agenzia per la Coesione territoriale*. Data concerning the other two most important *central taxes* (which are Personal Income Tax (PIT) and Corporate Income Tax (CIT) - come from the statistics on tax returns released by the Italian Ministry of Finance (*Statistiche sulle dichiarazioni fiscali*, cash basis). MEF dataset is the only one which provides data on single tax type: regionalization follows the residence for citizens and the registered office for economic entities. This criterion can be biased for VAT as Value Added Tax is not entirely paid in the region where final goods are consumed. Hence, only for VAT revenues (available both in MEF and CPT datasets), we selected CPT data because in this dataset VAT collected revenues were regionalized according to regional consumption patterns.

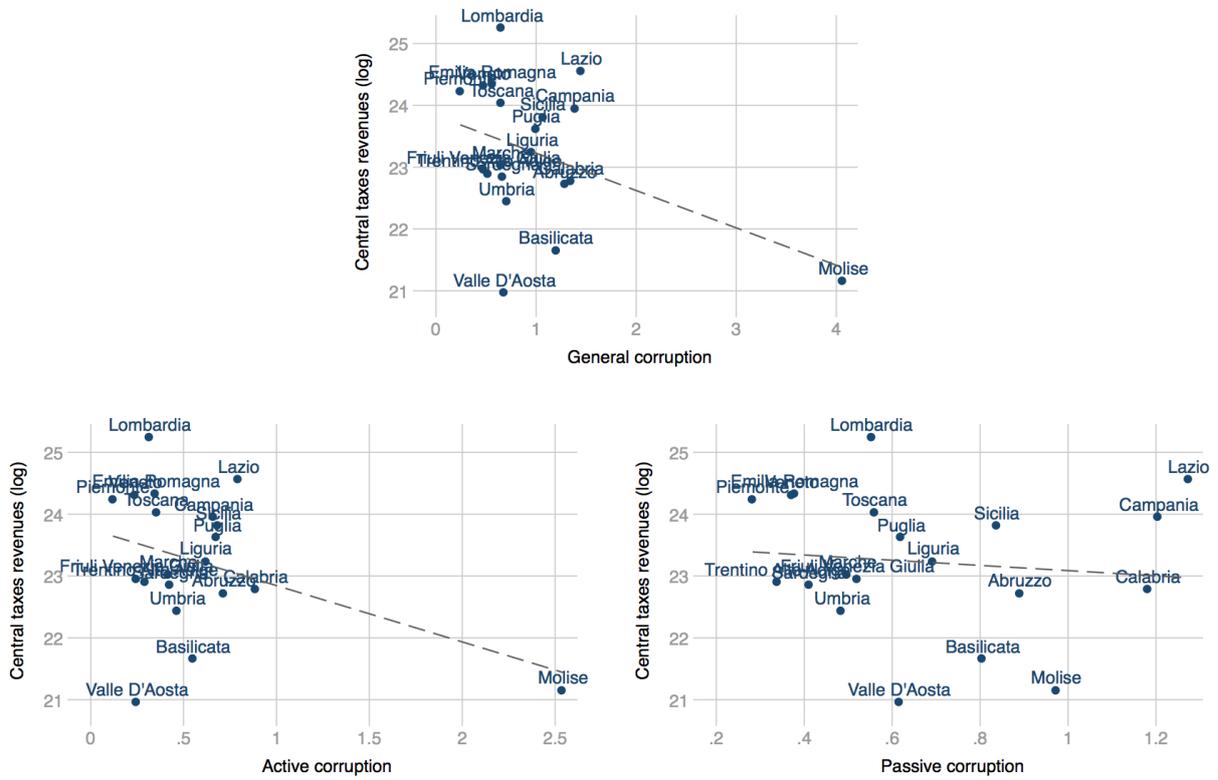
**Figure 1:** Annual average of active and passive corruption (left axis) and average log of tax revenues (right axis)



**Figure 2:** Regional average of active and passive corruption (right axis) and average log of tax revenues (right axis)



**Figure 3:** Scatter plots of the regional averages of general, active and passive corruption plotted against the regional averages of log of central taxes revenues. The dashed line represent a linear fit of the variables.



**Figure 4:** Scatter plots of the regional averages of general, active and passive corruption plotted against the regional averages of log of central taxes revenues. The dashed line represent a linear fit of the variables.

**Table 2 - Central tax revenues (per capita) and general corruption**

	Central taxes			PIT			VAT			CIT		
	FE	GMM	2-step	FE	GMM	2-step	FE	GMM	2-step	FE	GMM	2-step
GDP (log)	0.809*** (0.051)	1.007*** (0.047)	1.003*** (0.074)	0.471*** (0.087)	0.985*** (0.078)	0.985*** (0.088)	1.506*** (0.194)	1.039*** (0.042)	1.035*** (0.068)	2.165*** (0.515)	1.068*** (0.112)	1.073*** (0.176)
Economic backwardness	0.004 (0.011)	0.049*** (0.018)	0.050** (0.026)	-0.057*** (0.013)	0.021 (0.026)	0.042 (0.032)	0.005 (0.019)	-0.021 (0.028)	-0.020 (0.032)	0.043 (0.061)	-0.159 (0.117)	-0.182** (0.084)
Trade openness	-0.002*** (0.001)	0.001 (0.003)	0.001 (0.005)	-0.000 (0.001)	0.001 (0.003)	0.002 (0.004)	-0.000 (0.001)	-0.003 (0.003)	-0.002 (0.003)	-0.001 (0.003)	0.024*** (0.008)	0.023 (0.014)
Inflation	0.012** (0.005)	0.018** (0.007)	0.018* (0.009)	-0.001 (0.003)	-0.000 (0.012)	-0.006 (0.013)	0.020*** (0.005)	0.035*** (0.010)	0.027** (0.012)	0.004 (0.016)	-0.013 (0.030)	-0.026 (0.053)
<b>General corruption</b>	<b>-0.005*</b> <b>(0.002)</b>	<b>-0.010</b> <b>(0.013)</b>	<b>-0.010</b> <b>(0.014)</b>	<b>-0.005**</b> <b>(0.002)</b>	<b>0.000</b> <b>(0.020)</b>	<b>0.010</b> <b>(0.025)</b>	<b>-0.004</b> <b>(0.003)</b>	<b>-0.026</b> <b>(0.019)</b>	<b>-0.026</b> <b>(0.022)</b>	<b>-0.026**</b> <b>(0.011)</b>	<b>-0.025</b> <b>(0.052)</b>	<b>-0.006</b> <b>(0.057)</b>
Time trend	0.024*** (0.001)	0.026*** (0.003)	0.026*** (0.005)	0.024*** (0.001)	0.028*** (0.004)	0.027*** (0.004)	0.018*** (0.003)	0.019*** (0.004)	0.016*** (0.005)	0.008 (0.006)	-0.019* (0.011)	-0.021 (0.019)
Constant	3.183** (1.258)	-1.911* (1.075)	-1.805 (1.636)	10.557*** (2.146)	-2.402 (1.833)	-2.455 (2.066)	-15.245*** (4.784)	-3.589*** (0.921)	-3.514** (1.495)	-33.109** (12.678)	-6.215** (2.773)	-6.214 (4.134)
N	20	20	20	20	20	20	20	20	20	20	20	20
N. of obs.	260	260	260	260	260	260	260	260	260	260	260	260
N. of instrum.		18	18		18	18		18	18		18	18
R2 within	0.759			0.876			0.538			0.187		
R2 between	0.995			0.992			0.998			0.851		
R2 overall	0.994			0.985			0.995			0.841		
Hansen p-value		0.030	0.030		0.035	0.035		0.029	0.029		0.036	0.036
AR1 p-value		0.006	0.006		0.781	0.592		0.002	0.005		0.115	0.168
AR2 p-value		0.017	0.034		0.643	0.417		0.328	0.159		0.448	0.704

Notes: The time span is 2003–2015. The regressions are based on one-step (S-GMM) and on two steps (2STEP) Blundell and Bond System-GMM estimators. For the 2STEP, a small sample collection is applied. Significant coefficients are indicated by \*\*\* (<1% level), \*\* (<5% level) and \* (<10% level); robust standard errors in parentheses.

**Table 3 - Central Tax revenues (per capita) and two corruption regimes**

	Central taxes			PIT			VAT			CIT		
	FE	GMM	2-step	FE	GMM	2-step	FE	GMM	2-step	FE	GMM	2-step
GDP (log)	0.776*** (0.054)	1.005*** (0.028)	1.012*** (0.037)	0.439*** (0.095)	0.980*** (0.032)	0.984*** (0.035)	1.476*** (0.191)	1.035*** (0.074)	1.026*** (0.080)	2.039*** (0.521)	0.672*** (0.131)	0.662*** (0.139)
Economic backwardness	-0.000 (0.007)	0.004 (0.027)	0.005 (0.027)	-0.061*** (0.011)	-0.055** (0.026)	-0.044 (0.036)	0.000 (0.015)	-0.026 (0.026)	-0.022 (0.043)	0.033 (0.058)	-0.340*** (0.131)	-0.417*** (0.142)
Trade openness	-0.002*** (0.001)	-0.001 (0.002)	-0.001 (0.003)	0.000 (0.000)	-0.000 (0.001)	-0.000 (0.002)	-0.000 (0.001)	-0.003 (0.003)	-0.003 (0.004)	-0.001 (0.003)	0.032*** (0.010)	0.025** (0.010)
Inflation	0.012** (0.005)	0.017*** (0.004)	0.015*** (0.006)	-0.000 (0.003)	-0.001 (0.004)	-0.002 (0.005)	0.020*** (0.005)	0.033*** (0.010)	0.031** (0.015)	0.005 (0.016)	-0.015 (0.041)	0.006 (0.041)
<b>Active corruption</b>	<b>-0.026*** (0.006)</b>	<b>-0.053*** (0.020)</b>	<b>-0.047*** (0.018)</b>	<b>-0.026* (0.014)</b>	<b>-0.055*** (0.015)</b>	<b>-0.054*** (0.017)</b>	<b>-0.025* (0.012)</b>	<b>-0.024 (0.020)</b>	<b>-0.026 (0.028)</b>	<b>-0.074*** (0.025)</b>	<b>-0.348*** (0.090)</b>	<b>-0.423*** (0.146)</b>
<b>Passive corruption</b>	<b>0.010 (0.011)</b>	<b>-0.026 (0.023)</b>	<b>-0.030 (0.034)</b>	<b>0.013** (0.005)</b>	<b>-0.013 (0.032)</b>	<b>-0.008 (0.034)</b>	<b>0.005 (0.009)</b>	<b>-0.056 (0.037)</b>	<b>-0.053 (0.039)</b>	<b>0.003 (0.018)</b>	<b>0.014 (0.133)</b>	<b>0.006 (0.205)</b>
Time trend	0.023*** (0.001)	0.026*** (0.002)	0.026*** (0.003)	0.023*** (0.001)	0.027*** (0.003)	0.027*** (0.003)	0.018*** (0.003)	0.020*** (0.005)	0.019*** (0.004)	0.006 (0.006)	-0.035** (0.016)	-0.028 (0.017)
Constant	4.001*** (1.335)	-1.661** (0.673)	-1.830** (0.865)	11.341*** (2.346)	-1.960** (0.825)	-2.095** (0.923)	-14.477*** (4.723)	-3.460** (1.734)	-3.249* (1.841)	-29.969** (12.815)	4.020 (3.303)	4.624 (3.240)
N. of groups	20	20	20	20	20	20	20	20	20	20	20	20
N. of obs.	260	260	260	260	260	260	260	260	260	260	260	260
N. of instrum.		18	18		18	18		18	18		18	18
R2 within	0.771			0.884			0.547			0.193		
R2 between	0.996			0.989			0.997			0.857		
R2 overall	0.995			0.980			0.995			0.848		
Hansen p-value		0.078	0.078		0.057	0.057		0.049	0.049		0.180	0.180
AR1 p-value		0.018	0.012		0.087	0.139		0.004	0.007		0.015	0.040
AR2 p-value		0.016	0.037		0.791	0.785		0.553	0.533		0.690	0.889

Notes: see Table 2