University of Naples "Federico II"

Department of Economics and Statistics

Doctoral Thesis

Three essays on the structure of local public finance and the quality of the social context

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March 9, 2022

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Introduction

Local governments financial health is an increasingly prominent issue in many countries (e.g. Jones and Walker, 2007; Lobo, Ramos, and Lourenco, 2011; Winarna, Widagdo, and Setiawan, 2017). The reason is twofold. First, financial difficulties at a local level can cause public finance tensions at the national level. Second, municipalities in severe financial conditions reduce the bundle of publicly provided goods. This causes, among other things, disparities in access to services between citizens.

This thesis investigates some links between the evolution of the municipal budgets and the quality of the social context, starting from the crucial evidence of the huge amount of debt accumulated by Italian municipalities, currently equals to 38 billion euros (Dipartimento del Tesoro, 2021).

Clearly, a severe financial imbalance over time entails that available resources are insufficient to meet all the municipality's commitments. As an extreme consequence, financial distress may occur. In this case municipalities would be no longer able to perform their principal functions (Gregori and Marattin, 2019).

In Italy, measures to contain the debt of local governments have been introduced over the years. These measures were specifically designed to reduce local authorities possibility of contracting new debt, indirectly keeping under control the growing dynamics of the relative interest expenditure. These measures have proved to be not fully satisfactory, however. Partly because the incentives of local politicians are such as to push the budget in a direction which is opposite to the desired one. There are reasons to believe, for example, that in certain contexts, the high level of municipal debt strongly depends on a widespread tendency of the local authorities not to enforce payments by taxpayers (mainly local taxes, but also fines for violation of the traffic code and other payments).

This thesis tries to shed some light on these issues by examining whether and

how the characteristics of the social context condition the management of the municipal budget.

By quality of the social context it is here meant the level of civic-engagement within a given community, commonly referred as the intensity to which citizens participate in the life of a community in order to improve conditions for others or to help shape the community's future (Adler and Goggin, 2005). Civic engagement can take many forms, from individual voluntarism to electoral participation.

The significant role of civicness in affecting the evolution of the public finance has been recently debated in Econometrica (e.g. Besley, 2020b; Bowles, 2020; Bisin, 2020; Papaioannou, 2020; Besley, 2020a), starting from a thoughtful contribution by Tim Besley (Besley, 2020b), in which compliance with tax laws is identified as the key link between civicness and the management of the public finance. The conceptual framework developed by Tim Besley (Besley, 2020b) captures the role of civicness in encouraging tax compliance, so contributing to an expansion of the governments' fiscal capacity.

The role that intrinsic motivations, together with extrinsic ones, play in determining tax compliance, has been traditionally highlighted by the relevant literature on tax evasion. Extrinsic motivations are triggered by the choice of the tax enforcement policy, i.e. the probability of detection and the level of punishment (e.g. Becker, 1968; Allingham and Sandmo, 1972; Srinivasan, 1973; Yitzhaki, 1974; Sandmo, 2005); while intrinsic motivations depend on the intensity with which social norms of cooperative behaviour are felt within a given community (e.g. Benabou and Tirole, 2011): they either curb or encourage the desire to cheat on tax payments (e.g. Sandmo, 2005). Both motivations for tax compliance are directly or indirectly linked to the quality of the social context. In the case of intrinsic motivations, this link can be taken for granted, for the level of civicness is commonly defined with regard to the extent to which people are intrinsically motivated to cooperate for the public good. Such link becomes evident, however, also when the focus is placed on extrinsic motivations, as soon as one thinks of the tax enforcement policy as an outcome of the political process, obviously conditioned by what voters demand to politicians, hence by how much voters' motivations line up with the public good (e.g. Bisin and Federico, 2021).

This thesis grounds on these intuitions.

The first chapter theoretically investigates the circumstances that allow opportunistic politicians to exploit the promise of mild tax enforcement as a way to please uncivic voters. The focus is placed on the intensity of civicness at the municipal level (e.g. Bisin and Federico, 2021), which is the critical circumstance for the emergence of such promise. The theoretical framework is developed by merging insights from the strand of literature on political competition (e.g. Schumpeter, 1942; Downs, 1957; Lindbeck and Jőrgen W., 1987; Persson and Tabellini, 2000) with those accruing from non-standard models of tax evasion (e.g. Bordignon, 1993; Andreoni, Erard, and Feinstein, 1998; Posner, 2000; Luttmer and Singhal, 2014; Dwenger et al., 2016). Civicness is captured by directly internalising intrinsic motivations for tax compliance into citizens' preferences: in the model, agents have heterogeneous preferences on the (publicly-provided-good, enforcement level)-bundle, which reflect different degrees of civic-mindedness. In socially poor social contexts, such heterogeneity is exploited by unscrupulous politicians, who promise a lower level of tax enforcement as a means to win the elections and maximise their rent. Theoretical propositions are then empirically tested by considering the universe of Italian Municipalities. To evaluate average differences in the level of tax enforcement, municipal debt and supply of goods publicly provided, municipalities identified as having a low level of civic culture are matched with comparable, but *more civic*, groups of municipalities, by means of a genetic matching procedure (Sekhon and Grieve, 2011; Diamond and Sekhon, 2013). The empirical evidence suggests that in municipalities characterised by scarce civicness, strategic considerations induce politicians to set the level of tax enforcement at a sub-optimal level. Compliance with tax laws is consequently lower. As a result, in these contexts, the widespread tendency of the local authorities not to collect taxes reduces the municipal revenue-generating capacity and the quality of the goods publicly offered. Municipal debt is instead higher. Possibly, as an extreme consequence of these strategic budgetary policies, many municipalities face financial distress and cannot provide a satisfying level of services to citizens.

In the first chapter, the link with the electoral cycle is stressed. In particular, it is explicitly addressed the hypothesis that in municipalities with scarce civic culture,

the level of tax enforcement is strategically manipulated in order to gain voters' consensus. In doing this, we exploit a regulatory change forcing the Italian municipalities to cancel from the active section of their balance sheet any non-cashable credit. We find that the amount of active residuals follows an electoral-cycle logic, which is particularly evident in the proximity of the announced reform on the management of active residuals.

As a consequence of these processes, financial distress may occur. The case is analysed in the second chapter.

The economic literature on local governments distress has mainly assumed an accountant's perspective, attributing great relevance to the evolution of some key items in the balance sheet (e.g. Pammer, 1990; Brown, 1993; Kloha, Weissert, and Kleine, 2005; Jones and Walker, 2007; Cohen, Costanzo, and Manes-Rossi, 2017; Winarna, Widagdo, and Setiawan, 2017), without considering why these items evolve the way they do. In contrast, we focus on the mechanisms behind an adverse evolution of the budget components leading to distress. In particular, we investigate the role played by socio-economic factors in influencing the risk of financial distress via their impact on political competition.

The last chapter directly moves from the evidence of the high public debt at the municipal level, to argue that in such a situation, Italian municipalities will be likely obliged to reduce public spending or increase municipal revenues in the near future. Reducing spending implies an unavoidable reduction in the level of goods publicly provided, with consequences on citizens' welfare. However, increasing revenues is not that easy, because of the widespread inefficiencies of the local tax administration and the high propensity not to comply with the tax laws.

In this situation, a possible financial recovery strategy might incorporate the fruitful exploitation of real estate assets confiscated to criminal organisations. This patrimony currently amounts to 17513 assets (ANBSC, 2020) that municipalities could profitably manage in order to improve their current financial situation.

The point is whether conditions are given for its profitable management.

In this context, the length of time taken for reassignment of confiscated assets is of particular importance, for, as time goes by, the economic value of the assets shrinks. This is certainly due to the natural decay of the economic value of any

real estate asset when appropriate investments are not done. This is also due, however, to the fact that, as the time goes on, the probability that assets come under the illicit control of subjects or organizations increase; as increases the probability that assets are damaged by mafia-type organizations for retaliation. For all these reasons, shortening the time between confiscation and reassignment is crucial, if one wishes to preserve the economic value of the confiscated assets.

The results presented in the third chapter - based on an original dataset, made available by the National Agency for the Administration and Destination of Seized and Confiscated Assets from Organized Crime (hereafter ANBSC) - suggest that real estate assets located in suburban and rural areas record longer times to destination, compared to assets located either in town or in industrial/commercial areas.

The type of recipient also significantly impacts time. Local governments (region, province or municipality) exhibit higher reassignment time.

An interesting consideration concerns the positive effect of asset concentration in reducing the time necessary for reassignment. The massive presence of confiscated real estate assets in the municipality (compared to the total amount of municipal real estate units) reduces time. This result, apparently counter-intuitive, can be explained as the effect of a greater administrative capacity: local authorities facing a massive presence of confiscated assets acquire experience of the reassignment process.

Assets category also entails differences in the timing of destination. Real estate units for residential use are reassigned more quickly than other types of real estate. Land - with or without rural building - and similar assets, instead, significantly increase the length of reassignment. On the opposite, real estate for residential use have some appeal: single-family detached house, apartment building, garage and similar are quickly destined. This evidence suggests that the reallocation process should be differentiated according to asset-type. In particular, the evidence suggests that it might be better to promptly get rid of some assets by selling them, rather than seeing them deteriorating over time, what also reduces the probability of future reassignment. This would allow to either obtain or save resources that might be used to enhance the assets that remain available to the State.

Resources availability is indeed important to prevent deterioration of assets and to facilitate reallocation. To stress this point, we consider how financial conditions at

the municipal level affect reassignment time. We find that reassignment is adversely affected by severe financial conditions. The lack of adequate resources negatively influence re-allocation timing, despite of the fact that local governments in severe financial conditions are the ones that might benefit most from the confiscated assets.

From a policy perspective, this suggests the idea of a national Investment Plan endowing the municipalities with the necessary resources to enhance the assets located in their territory. This would allow to stop deterioration and favour a fruitful reallocation of the confiscated assets.

Chapter 1

Tax enforcement, political competition and social context

1

1.1 Introduction

The total public debt of Italian municipalities currently amounts to 38 billion euros (Dipartimento del Tesoro, 2021). Such a high level of indebtedness strongly depends on a widespread tendency of the local authorities not to enforce payments by taxpayers (mainly local taxes, but also fines for violation of the traffic code and other payments). As a consequence, many municipalities suffer from financial distress (Gregori and Marattin, 2019) and are not even able to provide a decent level of services to citizens.

A mild tax enforcement might clearly be an involuntary consequence of the municipal administrative inadequacy. On the contrary, it might be intentional; a way to please voters. In this paper we explore the latter hypothesis by looking at the circumstances that allow opportunistic politicians to exploit the promise of low tax enforcement as a way to please unprincipled voters and win the elections. In particular, we focus on the intensity of civic culture at the municipal level (e.g. Bisin and Federico, 2021) as the key circumstance for the emergence of such promise.

Our theoretical analysis merges insights from the (huge) strand of literature focusing on political competition (starting with Joseph Schumpeter and Anthony Downs) (e.g. Schumpeter, 1942; Downs, 1957; Lindbeck and Jőrgen W., 1987; Persson and Tabellini, 2000) with those accruing from non-standard models of tax evasion (e.g. Bordignon, 1993; Andreoni, Erard, and Feinstein, 1998; Posner, 2000; Luttmer and Singhal, 2014; Dwenger et al., 2016).

Theoretical predictions are then tested by considering the universe of Italian Municipalities. With regard to these, the evidence we provide suggests that in municipalities characterized by scarce civic culture - where voters are poorly motivated and compliance with social norms of cooperative behaviour is weak - strategic considerations induce politicians to set the level of tax enforcement at a sub-optimal level. Scarce civic culture at the municipal level is then associated with lower tax enforcement, higher municipal debt, and lower quality of the goods publicly provided.

The need of implementing a stricter tax enforcement policy clearly increases as the willingness to comply with tax laws goes down. In an ideal world in which any taxpayer would pay her tax bill, there would be no need of enforcing taxes.

According to the relevant literature on tax evasion, both extrinsic and intrinsic motivations play a role in determining compliance with tax laws. Extrinsic motivations are triggered by the choice of the tax enforcement policy, which establishes the probability of detection and the level of punishment (e.g. Becker, 1968; Allingham and Sandmo, 1972; Srinivasan, 1973; Yitzhaki, 1974; Sandmo, 2005). Intrinsic motivations are related with the intensity with which social norms of cooperative behaviour are felt within a given community (e.g. Benabou and Tirole, 2011). Intrinsic moral motives either curb or encourage the desire to cheat on tax payments (e.g. Sandmo, 2005).

Both the above mentioned explanations for tax compliance are - directly or indirectly - linked to the quality of the social context. This link is almost tautological whenever the focus is placed on intrinsic motivations, for the level of civic culture is commonly defined with regard to the extent to which people are intrinsically motivated to cooperate for the public good. Such link becomes evident, however, also in the case of extrinsic motivations, as soon as one thinks at the tax enforcement policy as an outcome of the political process, obviously conditioned by what voters demand to politicians, hence by how much voters' motivations line up with the public good (e.g. Bisin and Federico, 2021).

As will be explained in Section 1.2 below, in accordance with non-standard perspectives on tax evasion, a key feature of our theoretical model is that civicness is captured by directly internalizing non-material motivations into agents' preferences. In particular, we posit that citizens have heterogeneous preferences on the (publicly-provided-good, enforcement level)-bundle, which reflect different degrees of civic-mindedness. In poor social contexts, such heterogeneity is exploited by unscrupulous politicians, who promise a low level of tax enforcement as a means to maximize their rent.

As a result, in contexts characterized by poor civic culture, tax enforcement is lower. Compliance with tax laws is consequently lower, as well as the quality of the goods publicly offered. Municipal debt is instead higher.

Our empirical investigation focuses on a sample of 7036 Italian municipalities. We first consider particularly bad social contexts, characterized by very low level of civic culture. To identify such contexts, we take advantage of the Italian Law

221/1991, which establishes that a municipal council can be dismissed whenever the Judicial authorities have strong reasons to believe that elected local officials are captured by Mafia-type organizations. The dissolved council is then substituted by a commissioner appointed by the central government, who runs the municipality for a period of max 18 months, up to the following elections. As a result of the application of this Law, about 599 municipal councils have been dissolved from 1991 to November 2021 (some councils have been dissolved more than once).

We use the fact that a municipal council has been dissolved at least once as a way to identify municipalities characterized by poor civic culture. We show, however, that our results also hold by relying on more popular, widely accepted measures of civic culture, such as: voter turnout in referenda and the number of volunteers engaged in non-profit organizations at the municipal level (e.g. Putnam, Leonardi, and Nanetti, 1994).

Municipalities identified as having low level of civic culture will be matched with comparable groups of municipalities by means of a genetic matching procedure (Sekhon and Grieve, 2011; Diamond and Sekhon, 2013).

We then evaluate average differences between different groups of municipalities in the level of *active residuals*, municipal indebtedness and supply of goods publicly provided. Active residuals - i.e.: sums that the municipality should have cashed in the past, did not cash, but that it declares to expect to cash in the future - in particular, are able to signal how much loose is the effort by local governments to enforce tax compliance.

Our baseline results show that in municipalities that we identify as poorly endowed with civic culture, active residuals are 30% higher, public provision of goods is 10% lower, debt indexes are 2% higher.

These results resist to the application of different criteria to select the uncivic group. A placebo test also confirms their robustness.

In the last part of the paper we also stress the link with the electoral cycle. In particular, in Section 1.5 we explicitly address the hypothesis that in municipalities with scarce civic culture, the level of tax enforcement is strategically manipulated in order to gain voters' consensus. In doing this, we exploit a regulatory change forcing the Italian municipalities to cancel from the active section of their balance sheet any

non-cashable credit. We find that the amount of active residuals follows an electoral-cycle logic, which is particularly evident in the proximity of the announced reform on the management of active residuals.

The remaining of the paper is organized as follows: Section 1.2 provides the theoretical framework; Section 1.3 discusses our empirical strategy and provides an exploratory analysis of the data; Section 1.4 presents the main results; Section 1.5 reports a set of robustness tests, while Section 1.6 provide empirical evidence for our key assumptions; Section 1.5.3 describes our placebo test; Section 1.7 concludes.

1.2 Theory

Our analysis is based on a theoretical model with the following characteristics. There are two competing parties trying to get control over the municipal government. Each of them announces a political platform. Along with the quality of a good publicly provided, the platform specifies the level of tax enforcement. The provision of a publicly provided good is financed by a per-capita tax, whose level is set by a higher level of government. In accordance with non-standard models of tax evasion, a key feature of our perspective is that non-material motivations are internalized into agents' preferences. In other words, citizens have heterogeneous preferences on the (publicly-provided-good, enforcement level)-bundle, which reflect different degrees of civic-mindedness.

Before elections take place, both parties promise budget-balanced policies. However, there is an ex-ante intrinsic difficulty both for voters and higher levels of government to assess budget balancedness, for, crucially, all these players are imperfectly informed about the distribution, S, of civic-mindedness within the population, known by hypothesis only by the competing parties. There are two possible distribution of S, characterizing municipalities with either rich or poor civic culture. In municipalities characterized by poor civic culture, the party announcing a policy that is budget-balanced under the true distribution of S, is defeated by any dishonest party announcing a policy that is budget-balanced under a more favourable and optimistic, although unfounded, distribution of S. The more optimistic perspective on tax compliance allows the party adopting it to reduce tax enforcement below the

level that would be necessary to ensure budget balancedness. Lower tax enforcement is a good news for unscrupulous voters who support this party, even if the announced quality of the public good is inferior to the one promised by the other party.

As a result, in contexts characterized by poor civic culture, tax enforcement is lower. Compliance with tax laws is consequently lower, as well as the quality of the good publicly provided. Municipal debt is expected to be higher.

1.2.1   The model

In this section we briefly sketch our theoretical model.

Consider a municipality with a continuum of size one of risk neutral individuals, each of whom has preferences defined over consumption, c, and the quality q of one unit of good publicly provided: $u = c + \phi(q)$, where $c = y - T > 0$ is given by the difference between income, y, and a per capita tax, T, whose magnitude is decided at a national level. We suppose positive but marginally decreasing utility of q. In particular, we suppose $\phi'(q) > 0$ and $\phi''(q) < 0$, with $\phi'(0) \to \infty$.

We let k be the cost of a one-unit increase in the quality of the publicly provided good. So, assuming anyone pays the per capita tax, the maximum quality level is $q = T/k$. Individuals, indexed by i, differ in the (ex-post) regret of not conforming with social norms, $s_i \in R_+$. Each $s_i \in [0, \bar{s}]$ is drawn from S, with density $f(.)$ and cumulative distribution function $F(.)$, and can be meant as the psychological or reputational cost related with the detection of norm violation (e.g. Posner, 2000).

Public authorities try to enforce compliance by choosing the enforcement level, m, which in turn determines the probability that tax evasion is detected, $\sigma(m)$. Enforcement on taxpayers is costly. In particular, we suppose that the cost born by the government for any given enforcement level m is $\frac{m^2}{2\beta}$, with $\beta > 0$.

We suppose that $\sigma(0) = 0$. Moreover, we suppose that $\sigma' > 0$ and $\sigma'' < 0$ and that $sup\ \sigma(m) = 1$.

All the proceedings from taxes are used: either to finance tax enforcement or the public provision of the good.

Individual choice

Given m, an individual of type s_i will comply with tax laws whenever $\tilde{u} = y - T + \phi(q)$ is greater than the expected utility of trying to evade the tax, i.e. $E[u|T, \theta, m, s_i] = (1 - \sigma_m)[y + \phi(q)] + \sigma_m[y - T(1 + \theta) + \phi(q) - s_i]$, where, as it is common, θ is a strictly positive penalty surcharge.

$$\tilde{u} \geq E[u|T, \theta, m, s_i] \leftrightarrow s_i \geq \frac{T}{\sigma_m} - T(1 + \theta) \equiv \mathbf{s}(T, \theta, \sigma_m).$$

An individual i complies with the tax laws if s_i is greater than the threshold $\mathbf{s}(T, \theta, \sigma_m)$. Hence, whenever the threshold $\mathbf{s}(T, \theta, \sigma_m)$ increases, given $F(S)$, tax evasion increases. The opposite comes about whenever $\mathbf{s}(T, \theta, \sigma_m)$ gets smaller.

Increase in either m or θ reduce the threshold, while increases in T push it up, provided that $\sigma_m < \frac{1}{1+\theta}$.

The original model by Allingham and Sandmo, 1972 predicts that an increase in the tax rate has an ambiguous effect on evasion, due to the competing income and substitution effects determined by the tax increase. The paper by Yitzhaki, 1974 finds instead a negative relationship between the magnitude of the tax and the amount of evasion.

According to a large strand of recent economic literature, we disregard 'the cynical view of taxpayer behaviour' typical of models whose focus is on material incentives only. In our model, higher costs associated with norm violations reduce evasion (note however, that the original model by Allingham and Sandmo, 1972 also discusses the possible reputational costs of tax evasion, i.e. the social stigma attached to being caught in evading taxes).Therefore, keeping the values of all parameters constant, a rightward shift from one distribution $F(S)$ to an unambiguously superior distribution $F'(S)$, with $F'(S) < F(S)$, when there is no change in the support of S, $[0, \bar{s}]$, reduces evasion.

Enforcement and public good provision

Suppose a policy maker sets $m = \hat{m}$, then $\sigma(\hat{m})$, the probability that tax evasion is detected, is determined, and so is $\mathbf{s}(\sigma_{\hat{m}}) = \frac{T}{\sigma_{\hat{m}}} - T(1 + \theta)$.

Also the tax proceedings, R, are determined, for they are equal to $R = T\lambda_{\hat{m}} + T(1+\theta)(1-\lambda_{\hat{m}})\sigma_{\hat{m}}$, where $\lambda_{\hat{m}} = [1 - F^T(\mathbf{s}(\sigma_{\hat{m}}))] = Pr\{s_i > \mathbf{s}(\sigma_{\hat{m}})\}$.

Given $m = \hat{m}$, quality provision is equal to $\hat{q} = \frac{T\lambda_{\hat{m}} + T(1+\theta)(1-\lambda_{\hat{m}})\sigma_{\hat{m}}}{k} - \frac{\hat{m}^2}{2\beta k}$.

In general, the level of enforcement that maximizes quality provision is given by $\frac{\delta q}{\delta m} = 0$, which implies

$$T[\lambda'_m(1 - \sigma_m(1+\theta)) + \sigma'_m(1-\lambda_m)(1+\theta)] = \frac{m}{\beta} \tag{1.1}$$

Equation (1.1) simply states that to maximize the quality of the good publicly provided, local authorities should push the enforcement level up to the point where the increase of tax revenues it generates, equals the marginal cost of enforcement. Increasing m beyond the level which satisfies (1.1) is counterproductive, for the increase in m paradoxically reduce the resources available for public provision. Equation (1.1) resembles the idea of fiscal capacity (Besley, 2020b), defined as the maximum tax revenue that a government can raise given the civic culture and its coercive power.

Political competition

We suppose that two political parties compete to take the power, Party A and Party M. Competition is modelled as a two-stage game. In the first stage, each party proposes its policy, characterized by a level of tax enforcement coupled with a quality level for the good publicly provided; in the second stage individuals vote. The party gaining the majority of votes wins the elections.

As is standard in models of probabilistic voting (e.g. Persson and Tabellini, 2000), we suppose that both parties wish to maximize their expected rents, given by $(G - q_v) \times \rho_v$, where G is the rent of being in office, and $\rho_v = \rho_v(\pi_A, \pi_M)$ is the probability that party $v = (A, M)$ wins the elections, given the policies announced by both parties, $\pi_A = (m_A, q_A)$ and $\pi_M = (m_M, q_M)$, and the voters' preferences. Clearly, $\rho_A + \rho_M = 1$.

We suppose that G is greater than q^{max}. This is the value of q determined by equation (1.1). This means that the (absolute) rent of being in office is positive even though the party supplies the highest possible level of q.

If party v announces a policy $\pi_v = (m_v, q_v)$ that confers greater utility to the majority of voters, $\rho_v = 1$, the probability that the competing party will win the elections is zero. In the special case in which parties announce the same policy or exactly half of the voters would prefer one policy against the alternative, $\rho_v = \frac{1}{2}$ (e.g. Solano-Garcia, 2017). To avoid unnecessary complications, we will assume that if ρ_v is exactly equal to $\frac{1}{2}$ party M would win (all the results hold also without this assumption).

Before elections take place, both parties promise budget-balanced policies. However, ex-ante there is an intrinsic difficulty both for voters and higher levels of government to assess budget balancedness, for, crucially, all these players are imperfectly informed about the true distribution of S, $F^T(S)$, known by hypothesis only to the competing parties.

We suppose that while party A announces a policy that is budget-balanced under the true distribution of S, $F^T(S)$, party M announces a policy that is budget-balanced under the prototypical distribution of S across municipalities $\tilde{F}(S)$, whenever $\tilde{F}(S) \leq F^T(S)$. This means that in bad social contexts, the distribution of S on which party M relies to design public policy, is optimistically (and intentionally) biased.

So, each party $v = (A, M)$ promises a level of q that is budget balanced, given the enforcement level and the alleged distribution of S, i.e.

$$E[D|\pi_v, F(.)] = q_v k + \frac{m_v^2}{2\beta} - [T\lambda_v + T(1+\theta)(1-\lambda_v)\sigma_v] = 0 \qquad (1.2)$$

where $E[.]$ is the expectation operator and D stands for fiscal deficit.

Thus $E[D|\pi_M, \tilde{F}(S)] = 0$ and $E[D|\pi_A, F^T(S)] = 0$ is what each party declares to be the expected public debt implied by its policy, given the distribution of S it presumes.

Individuals do not care about public debt. Indeed, their utility only depends on the level of tax enforcement and the quality of the good publicly provided. Any individual of type s_i is thus assumed to vote for party $v = (A, M)$ if the policy announced by v, i.e. π_v, grants her an higher (expected) utility, and otherwise abstain (e.g Lindbeck and Jőrgen W., 1987).

Equilibria

In this game, an equilibrium $\left[\pi_A^* = (q_A^*, m_A^*), \pi_M^* = (q_M^*, m_M^*)\right]$ is achieved whenever, given the policy enacted by the opponent, no party can increase its own rent by changing policy.

There are three potential equilibria. Two of these cases correspond to boundary equilibria, in which π_A^* is such that either: i) $q_A^* = 0$ or ii) $q_A^* = q^{max}$ as defined by (1.1). Case iii) corresponds to a interior equilibrium in which $0 < q_A^* < q^{max}$.

Notice first that in equilibrium each party promises a non-zero level of q. Indeed, as the marginal utility of the public good raises as $q \to 0$, whenever one's opponent is offering $q_v = 0$, $v = A, M$, the other party has incentive to marginally increase q, so winning the elections. As the party playing a non-zero level of q has incentive to keep its provision at the lowest possible level, given the marginal rate of substitution of each individual between q and σ, i.e. $\frac{d\sigma}{dq} = \frac{\phi'(q)}{T(1+\theta)+s_i}$, the other party can always determine a level of q which is rent-increasing, for it is preferred by any individual for any possible value of s_i.

This argument establishes that no equilibria are possible in which at least one party promises zero provision of q. The following Proposition shows that Party M never provides, in equilibrium, a level of q greater than the one provided by Party A. Moreover, its equilibrium level of the enforcement is always strictly smaller.

Proposition 1. *If $\tilde{F}(S) < F^T(S)$, the equilibrium policies (π_A^*, π_M^*) are such that: $q_M^* \leq q_A^* \leq q^{max}$ and $m_M^* < m_A^*$, with $E[D|\pi_A^*, F^T(S)] = 0$ and $E[D|\pi_M^*, \tilde{F}(S)] > 0$. The equilibrium policies always allow Party M to win the elections.*

Proof. See Appendix A2. ☐

Remark 1. *Any interior equilibrium is such that $q_M^* < q_A^*$. Given the parameters of the model and the distribution of S, there can be a boundary equilibrium with $q_M^* \leq q_A^* = q^{max}$.*

In particular, $q_M^* = q_A^* = q^{max}$ comes about provided that both equilibrium policies ensure tax compliance of the majority of voters, $\boldsymbol{s}(\sigma_A^*) < \boldsymbol{s}(\sigma_M^*) < Median(S)$.

Proof. See Appendix A2. □

Consider now the the effect of a rightward shift from one distribution $F^T(S)$ to an unambiguously superior distribution $F^{T'}(S)$ when there is no change in the support of S, $[0, \bar{s}]$. That is, for all $0 < \hat{s} < \bar{s}$, $F^{T'}(S) < F^T(S)$. The values of all other parameters are held constant.

Proposition 2. *A rightward shift in the distribution of S increases the equilibrium quantity of q.*

Proof. See Appendix A2. □

1.3 The empirical analysis

In this section we describe how the theoretical analysis sketched above can be brought to data by considering the universe of Italian municipalities. Results are then discussed in Section 1.4.

The empirical strategy is simple. We first identify groups of municipalities characterized by a poor social context, where civic motivations and willingness to comply with social norms of cooperative behaviour are presumably scarce. Such identification is carried out by relying on the proxy variables identified by the relevant literature. Some of these variables directly relate to civic engagement, that is, to ways in which citizens participate in the life of a community in order to improve conditions for others, or to help shape the community's future (Adler and Goggin, 2005). Individual voluntarism and electoral participation are two obvious forms of civic engagement suitable for dimensional measurement. A further variable identifies the level of civicness only indirectly, by considering municipalities in which ties are detected between elected local politicians and criminal organizations.

By changing the variable proxying for the level of civicness, we identify three different groups. To simplify the language and to favour readability, we just refer to these groups of municipalities as *uncivic*. For any such group of uncivic municipalities, a comparable *civic* group is in turn built, and average differences in key

dimensions (tax enforcement, quality level of publicly provided goods, level of indebtedness) between civic and uncivic groups, are measured.

For any uncivic group, a comparable group of civic municipalities is selected by means of a genetic matching procedure, where comparability means statistical equivalence along all the dimensions that can be considered as relevant in the case at hand - geographic, demographic and socio-economic - except for the key dimension catching civicness.

Relying on different proxy variables to grasp the level of civicness clearly reduces the risk that results are driven by a biased selection of the group of uncivic municipalities.

In line with our theoretical predictions, in municipalities characterized by a poor social context - i.e. in municipalities where the distribution of S is very shifted to the left - we expect scarce tax enforcement by public authorities. Consequently, we expect higher municipal debt and a lower quality of the goods publicly provided.

Matching is brought about at the beginning of the period under consideration, i.e. at year 2001. Then, we evaluate differences between uncivic and civic groups in the average value of tax enforcement, level of public good provision and public debt, over the period 2001-2013.

1.3.1   Catching civicness

To get more clear-cut results, we start by considering situations in which the quality of the social context is extremely unfavourable.

To identify such situations, we take advantage of the Italian Law 221/1991, which allows the Central Government to dismiss the municipal council when there are reasons to believe that Mafia-type organizations are able to influence (or control) a relevant part of the council members, with sensible effects either on the functioning of the council itself or on the nature of the decisions it takes. In case of council dismissal, the municipality is put under external administration for 12-24 months, until new elections are held. Overall, as a result of this piece of legislation, about 556 municipal councils have been dissolved from 1991 to June 2020 (mostly in southern regions). As emphasized in many reports of the national Anti-Mafia Commission, the dissolution of the municipal council does not represent in itself the ultimate relief

against the influence of Mafia-type organizations, hence an efficacious way to really stop their influence(e.g. Ministero dell'Interno, 2014). This is because their influence at the municipal level is fed by social norms which allow a broad support to (closed) Mafia-type elites. Where civicness is poor, council dismissals cannot permanently break the ties between criminal organizations and local officials. This is also witnessed by the fact that in many municipalities the council has been dismissed more than once over the last thirty years.

In general, what emerges from the official reports - and from many informal talks the authors had with former national anti-mafia Prosecutor, Franco Roberti - municipalities whose council has been dismissed due to Mafia infiltrations are generally characterized by scarce civicness:

> The State [...] through the extraordinary management of the municipalities dissolved by infiltration and Mafia conditioning, intervenes in *deeply compromised context* in which the interests of the community are seriously affected. The recovery of credibility and trust in institutions is certainly one of the most breakable purposes for the Commissions, which must, in a short period, face a series of long-standing issues, in often *hostile contexts* and characterized, moreover, by a widespread scepticism of the population about the possibility of making a real change, with a significant distrust of the effectiveness of the State intervention (e.g. Ministero dell'Interno, 2014).

Thus, in what we consider our *baseline analysis*, we identify as uncivic municipalities those that have faced at least one council dismissal during the period 2001-2013. It is noteworthy that, as external commissioners are of limited power, their presence negatively affect public expenditures (particularly investments) and revenues at the municipal level (e.g. Acconcia, Corsetti, and Simonelli, 2014; Galletta, 2017; Di Cataldo and Mastrorocco, 2020). That is why, in computing the average values of the variables of interest over the period 2001-2013, we exclude, for any given municipality subjected to council dissolution, the years in which the municipalities were ruled by the external commissioners.

Dissolution of the municipal council is, however, only one of the circumstances we exploit to identify municipalities characterized by scarce civicness. As mentioned above, our analysis also relies on variables directly catching civicness by using measures of civic engagement, such as voter turnout in referenda and the share of people volunteering in non-profit organizations at the municipal level (e.g. Putnam, Leonardi, and Nanetti, 1994; Bürker and Minerva, 2015). We identify two further uncivic groups by considering municipalities where: the share of people employed as volunteers in non-profit organizations is lower than a given threshold; voter turnout in referenda is particularly low (less than 10% and 15% respectively).

As we will discuss in Section 1.5.2 below, threshold are determined in accordance with the results of the baseline analysis.

1.3.2   Tax enforcement, municipal debt and the quality of publicly provided goods

To capture the level of tax enforcement we observe the extent to which payments of local taxes are enforced by local authorities. Such payments are not related to tax bases that citizens can hide to the public authority's eye. These sums are certain and due, and public authorities, as a last resort, could take legal steps to obtain their payment. We therefore rely on data about *active residuals* (computed as the ratio between active residuals and municipal revenues), that is, sums that the municipality should have cashed in the past, did not cash, but that it declares to expect to cash in the future. This declaration generally allows the municipal council to close the yearly budget in equilibrium. Notice that it is quite a common practice, in many Italian municipalities, to report in the balance sheet active residuals corresponding to credits accrued very far in the past. Credits with a high probability of never being cashed. In doing so, municipal authorities basically approve a fake budget, which hides an underlying financial imbalance. This is why the size of active residuals is one of the indices used by the *Corte dei Conti* - the Italian judicial authority monitoring how public resources are managed - to signal the presence of financial distress (e.g. Ahmad, Bordignon, and Brosio, 2016).

To catch municipal indebtedness, we use two different indices: the incidence of interest payment over total current expenditure and the ratio between interest

payments and revenues. A recent reform of the accounting rules and practices at the local level suggest to look at these indices s to assess debt accumulation.

To investigate whether in poor social contexts a lower level/quality of publicly provided goods is supplied, we rely on data about waste management. We rely on this type of expenditure for two reasons. First, because a relevant share of active residuals is composed by tax payments (never cashed) that should have contributed to finance waste management; second, because waste management is among the most relevant - in some cases, the most relevant - competencies of the Italian municipalities. Indeed, the incidence of waste management expenditure over the overall municipal expenditure on public services amounts to 36% on average. To catch the quality of the goods which are being publicly provided, we focus on differences in the municipal waste recycling rates.

1.3.3 Data

The empirical analysis draws on a rich dataset describing many relevant features of each of 7036 (over 7903, 89%) Italian municipalities over the period 2001-2013. These data are provided by the Italian National Institute of Statistics (ISTAT, Statistical Atlas of Italian municipalities). We omitted from the analysis only municipalities for which reliable data are not available, in many cases because of the merger processes in which these municipalities were involved.

Data about active residuals, as well as all the data concerning items of the municipal balance sheets, are published by the Ministry of Domestic Affairs and are available on the Bureau Van Dijk platform (AIDA PA).

To capture the quality of the social context we first rely on council dismissal. Correspondingly a dummy is built that takes value one if the municipality incurred, over the period 2001-2013, in at least one council dismissal because of Mafia capture. Data about dismissals of the municipal councils are published in the Reports edited by the Anti-mafia Commission (e.g. Ministero dell'Interno, 2014). These data show that 132 municipalities incurred in a council dismissal in the relevant period; among these, 21 (16%) faced two dismissals.

The empirical investigation also relies on a bunch of covariates which are relevant for comparison. Table A.1 in the Appendix details all of them. In particular, the

matching procedure is based on the following set of variables: i) geographic variables: Altitude, Being located in mountainous area (*Mount*); ii) demographic variables: Population density (*Popdens*), Household size (*HouseSize*); iii) socio-economic variables: per capita income (*Income_pc*), employment rate (*EmplRate*), firm density (*Firmdens*), education rate (*EduRate*). To take into account the size of the public sector, the matching procedure also includes data on per capita public expenditure at the municipal level, *TotalExp_pc*.

1.3.4   Exploratory analysis

In this section we provide an exploratory analysis of the data. As a first step, we investigate the correlation between main variables contemplated by the matching procedure (see Fig.A.1 in Appendix).

The upper triangular correlation matrix represented in Figure A.1 is built by considering all the municipalities in the dataset. It reveals two interesting facts. First, the selected variables are sufficiently uncorrelated to each other. Second, the only relevant correlations emerge between active residuals, the employment rate and the level of income per capita. These negative correlations suggest that higher economic activity at the municipal level is generally coupled with lower residuals. This might depend on either (both) better tax enforcement or (and) an higher propensity to comply with the tax laws as economic prospects improve. In any case, the matching procedure discussed in great detail below helps in getting rid of the effect of any confounding factor.

Some interesting evidence emerges as soon as we plot the distribution of active residuals by considering either the subset of municipalities whose council was dismissed, or its complement, where the uncivicness is in turn defined according to one of the three different proxies discussed in Section 1.3 above: council dismissal due to Mafia infiltration, voter turnout in referenda and the number of volunteers engaged in no-profit organizations at the municipal level.

Fig.A.2 (2a) shows that the ratio between active residuals and municipal revenues for municipalities whose council was dismissed at least once is in the range $0.7 - 1.6$ ($0.4 - 1.2$ if one considers all the other municipalities).

The picture does not change that much if one identifies uncivic units by using the percentage of volunteers engaged in no-profit organizations (Fig.A.2, 2b) or voter turnout in referenda (Fig.A.2, 2c). In the first case, uncivic units show a ratio between active residuals and municipal revenues in the range $0.6 - 1.3$ ($0.3 - 0.8$ in the remaining population); in the second case, we observe that residuals are distributed over the interval $0.7 - 1.5$ ($0.5 - 1.2$ is the corresponding interval in the remaining population).

We also explore possible differences in the indexes signalling financial indebtedness between uncivic units and the population at large. No differences emerge, either focusing on the incidence of interest expenditure over total municipal expenditure or placing the attention over the burden of the municipal debt.

1.3.5   Estimation strategy

Matching has become a popular method for causal inference in many fields, and different approaches have been developed. Among these, the most common ones are the propensity score matching and the multivariate matching, often based on the Mahalanobis distance. Here we rely on a refined matching procedure, the genetic matching method developed by (Sekhon and Grieve, 2011) and (Diamond and Sekhon, 2013).

Genetic matching automates the iterative process of checking and improving overall covariate balance (Rosenbaum and Rubin, 1984), guaranteeing asymptotic convergence to the optimal matched sample.

In what follows, the association between uncivic and civic municipalities is based on a multivariate matching procedure that uses an evolutionary search algorithm (Mebane Jr. and Sekhon, 1998; Mebane Jr. and Sekhon, 2011). The peculiarity is that the algorithm weights each observed covariate with the aim of optimizing post-matching covariate balance.

The logic that inspires this approach is borrowed from the analysis of evolutionary processes.

Following (Diamond and Sekhon, 2005) and (Sekhon and Grieve, 2011), genetic matching works by minimizing a generalized version of the Mahalanobis distance (GMD), characterized by an additional weight parameter, W:

$$GMD(X_i, X_j, W) = [(X_i \check{} X_j)^T (S^{-1/2})^T W S^{-1/2} (X_i \check{} X_j)]^{1/2} \qquad (1.3)$$

where X_i and X_j are vectors of covariates for uncivic units i and civic units j; $(S^{1/2})$ is the Cholesky decomposition of the variance covariance matrix S of the covariates, and the weight matrix W is included to reflect the relative importance of each covariate to optimize overall covariate balance.

The evolutionary process impinges upon the weights of the W matrix, for its components are estimated through a genetic algorithm.

The matching process goes on as follows. It starts by randomly selecting a weight matrix, hence, given (1.3), it starts by determining an initial distance metric. The generalized Mahalanobis distance between any unit belonging to the uncivic group and any other belonging to the civic, is then computed, and a comparable group is determined by a 1-to-1 matching with replacement. Weights are then subjected to random disturbances. Because of these, a new weight matrix is defined and a new appropriate comparable group is determined. If the matching with the group of uncivic municipalities ensures a better balance of the covariates, the new comparable group is taken as the reference one. The process goes on iteratively to improve overall covariate balance, so as to guarantee asymptotic convergence to the optimal matched sample.

As matching on the propensity score in addition to the covariates improves the method (Sekhon and Grieve, 2011), we replace X_i and X_j in (1.3) with Z_i and Z_j, where these vectors include also the propensity score, that is, the probability of being uncivic .

Here we summarize the main steps of our estimation strategy, based on the genetic matching procedure. We first use the dummy for council dismissal, *Dissflag*, as the dependent variable (in subsequent tests such variable is first replaced by voter turnout in referenda and then by the number of people volunteering in non-profit organizations, at municipal level). Hence,

- we implement a propensity score estimation by mean of a logistic regression, using as covariates the following variables at the municipal level: altitude, population density, household size, employment rate, education rate (nothing

changes if population density is replaced by population dimension and municipal size);

— we match on the propensity score in addition to the covariates. These include: altitude, population density, income per capita, household size, employment rate, education rate, firms density and the total per capita public expenditure. The output here is a group of civic municipalities and a set of pre and post matching balance statistics for each covariate (better explained in Section 1.4), to evaluate how well civic and uncivic groups match;

— we estimate the average differences in outcomes between the uncivic and the civic group. The latter is build up by 1-to-1 matching with replacement.

1.4 Baseline Results

1.4.1 Balancing the samples

In this section we describe the results delivered by the Genetic Matching procedure when uncivic municipalities are identified by council dissolution over the period 2001-2013. These are our baseline results. In Section 1.5.2 below, we show that all the results survive when the identification of uncivic municipalities is carried out by using more standard proxies, such as voter turnout in referenda or the percentage of inhabitants engaged as volunteers in non-profit organizations.

We have first estimated the propensity score, using a logistic regression. Then we have built the covariates matrix, using both the values of the explanatory variables at time t=2001, and the propensity score, estimated in the same year.

The procedure allows to maximise the balance of observed covariates between civic and uncivic groups. In particular, it minimizes a measure of the maximum observed discrepancy between the two groups at every iteration of the process (it is possible to choose the number of bootstrap samples to be run, in this case 1000).

Balance statistics and empirical-QQ plots are then provided for each variable in the covariates matrix. Table A.2 in the Appendix shows the typical results the procedure delivers by considering only two covariates.

The first three rows in Table A.2 show the mean values of per capita income and the standard deviation of the differences in mean, for the civic and uncivic group, before and after matching.

In the last set of balance statistics the ratio of variances (treatment over control) is shown. This ratio equals one in case of perfect balance. Indeed, for all the variables, the variance ratio is included in the range $0.67 - 1.33$.

Table A.2 also reports the p-value associated with the t-test for the difference between means. For each variable contained in the Table (and, in general, for each considered covariate) we can accept the comparison hypothesis. The last three values are the results of the Kolmogorov-Smirnov tests [2]. In the case at hand, the balance of the variables included in the matrix of the covariates has significantly improved with respect to the before matching situation. Differences have been reduced up to the point that the remaining imbalance in these covariates is not a serious concern. The group of treated municipalities and the control group have become statistically equivalent along many dimensions. This also emerges from the empirical QQ-plots provided for all the covariates (see Figure A.3 and A.4).

In the Appendix we report only two plots (see Figure A.3 and A.4), regarding the total municipal expenditure per capita and the level of income per capita. When looking at the Figures, notice that they plot covariate values that fall in (approximately) the same quantile of civic and uncivic groups distributions. Civic unit quantile values are plotted on the x-axis, and uncivic unit quantile values are plotted on the y-axis. Data points that fall exactly on the 45 degree line indicate that the marginal distributions are identical. As Figure A.3 shows, the after matching level of public expenditure per capita in each quantile is homogeneously distributed between groups. The level of expenditure per capita follows a roughly normal distribution - which is desirable - since the Q-Q line is mostly a straight line. Analogous considerations apply when considering Figure A.4 and the plots concerning the other variables. Balance is dramatically improved by the matching procedure. This increases the confidence in results reported in Table 1.1.

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[2]The first is the bootstrap p-value, testing the hypothesis that the probability densities for both the groups are the same. The bootstrapped Kolmogorov-Smirnov test, unlike the standard test, provides correct coverage even when there are point masses in the distributions that are being compared. The Kolmogorov-Smirnov statistic of the two-tailed test is calculated as the distance between the empirical distribution functions of the two samples.

1.4.2 Differences in Active Residuals and Municipal Debt

After having balanced all the relevant covariates, we find that municipalities char-
acterized by a poor social context (municipalities in which the council has been dis-
solved at least once) display a level of active residuals which is 30% higher than
the one in more virtuous municipalities (see Tab. 1.1). More precisely, the average
difference in outcome is 0.2918, with a standard error, computed by default as the
Abadie-Imbens (AI), of 0.12915. This result confirms our theoretical hypotheses.

TABLE 1.1: Baseline results

Proxy for civicness: Council dismissal				
	Outcome differences	*p-value*	*Uncivic obs.*	*Civic obs.*
Active residuals	0.2918	0.0238	132	132
Debt_index	0.0241	0.0517	132	132
Level of recycling	-0.0964	0.0082	132	132

As the difference in the level of residuals (about 30%) between uncivic and civic
municipalities is relevant, uncivic ones are less eager to collect all potential taxes. As
the municipal budget is prepared by equating expected revenues to expenditures,
lower revenues means indebtedness.

Notice that the Italian Constitution has now embedded the so-called *golden rule*,
according to which local governments can fall into debt exclusively to finance capital
expenditure. So, it is not possible to finance current expenditures by increasing the
municipal debt [3].

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[3]The constitutional reform, carried out by Law n. 1/2012, which introduced the principle of *balance-
sheet balancing* for all the public administrations, imposed further constraints on local authorities in
terms of debt levels, which overlap with those established by article 119 of the Constitution. The
limit is represented by the impact of the interest costs on the current revenues of local authorities.
Especially, Article 204 of Legislative Decree no. 267/2000 (*Testo Unico Enti locali*, TUEL) dictates that
the local authority can take on new mortgages and access other forms of financing available on the
market, only if the annual interest payments do not exceed a given percentage of current revenues.
This reference percentage has been steadily reduced over the years, up to the 6%

In practice, however, local governments incur into debt either because of new and unexpected expenditures (so called off-budget debts) or because, given expenditures, taxes are not collected. The bad practice of resorting to off-balance debt as a way to circumvent fiscal discipline is widespread and has increased the financial difficulties of many municipalities over time.

To test whether there are differences in debt levels across groups of municipalities, we use information concerning the incidence of debt interest payments over both total current revenues and total current expenditure. We focus on the civic and uncivic groups used to build the baseline test above (uncivic are then still identified by council dissolution). Thus, we have a sample of 266 municipalities (132 civic municipalities and 132 uncivic municipalities), observed over the period 2001-2013.

Our results show that there is a statistically significant difference between the two groups of municipalities. Uncivic ones display a greater incidence of interest payments over total current expenditure (2% greater compared to municipalities with no council dismissal), as reported in Tab. 1.1.

1.4.3   Quality of the publicly provided goods

To investigate the differences in the quality level of the goods publicly provided, we consider differences in municipal waste recycling rates between civic and uncivic municipalities. Uncivic municipalities are still identified by council dismissal.

We expect significant differences in the level of municipal waste recycling rates between the two groups of municipalities. Indeed, we find a sizeable difference. The group of uncivic municipalities displays an average recycling rate which is 10% lower compared to the other group (see Tab.1.1).

As there is great variability in waste management spending across municipalities, we implemented a new Genetic Matching procedure in such a way as to build a civic group also comparable along the spending on waste management dimension. Table A.3 in Appendix points out that even with the same level of spending on waste management, uncivic municipalities exhibit a percentage of recycling which is 9% lower.

As we will show in Section 1.5 below, these results hold also when the group of uncivic municipalities is identified by relying on different proxies for civicness.

1.5   Robustness analysis

In this section we provide a set of robustness tests for our baseline results. In particular, we test whether our estimates change when switching to a different variable as a proxy for the quality of the social context. We also provide a validation test.

1.5.1   Validation test

We run a validation test to support the interpretation of results in Section 1.4. In our baseline analysis, following the genetic matching procedure outlined above, we construct a covariates matrix containing the values of the explanatory variables at 2001 and a propensity score estimation. Then, we evaluate changes in the structure of the municipal public expenditure, regardless of the year in which the council dismissal was brought about. In so doing, we exclude the provincial code from the covariates matrix, with the aim of cleaning our results from spillover effects. So, the first output delivers: an uncivic group of municipalities, where the level of civicness is defined by council dismissal due to Mafia infiltration; a civic group selected from the universe of Italian municipalities.

What we do with the validation test is not removing potential spillover effects. We replicate the 1-to-1 matching with replacement and evaluate differences in outcomes, taking care to link to each uncivic municipality a civic one that belongs to the same province. Results are consistent with our baseline analysis, reported in Section 1.4.

Municipalities with a poor social context display a level of active residuals which is 31% higher than the average of more virtuous municipalities. Results are shown in Appendix Table A.4.

1.5.2   Using alternative proxies for civicness

In the baseline analysis we have captured the quality of the social context by relying on the evidence of council dismissal due to Mafia infiltration. There are, however, other possible proxies that the literature on civic culture suggests. Two of these, very popular indeed, were suggested by Robert Putnam in his classic book *Making Democracy Work* (Putnam, Leonardi, and Nanetti, 1994): voter turnout in referenda and the

number of volunteers involved in non-profit organizations. To check whether our results are driven by a biased choice of the variable signalling the quality of the social context, we replicate the baseline analysis by substituting council dissolution with other variables playing the same role: voter turnout in referenda; the ratio of volunteers in non-profit organizations over the municipal population.

As far as voter turnout is concerned, we collected data about two different referenda. In particular, we selected two cases quite unable to trigger participation based on self-interest, so that voter turnout is more likely to reflect civic engagement. One these referenda was held in 2009. It aimed at repealing specific provisions of the electoral Law. The other, held in 2016, was on the proposed repealing of a law that allows gas and oil drilling concessions extracting hydrocarbon within 12 nautical miles of the Italian coast to be prolonged until the exhaustion of the useful life of the fields. In both referenda, the overall participation was very scant. The turnout was well below the majority threshold required to validate the result (23% and 31% in 2009 and 2016 respectively).

Clearly, to discriminate between civic and uncivic contexts, we needed to set a threshold, both for voter turnout in referenda and for the ratio of volunteers in non-profit organizations over the municipal population.

To keep discretion at the minimum, we adopted the following procedure. We replicated several times, for both variables, the Genetic Matching procedure illustrated in Section 1.3 above, using different thresholds to define uncivicness. For example, as far as volunteering is concerned, we started by setting a threshold equal to 10% and defined as uncivic all the municipalities with a volunteers/population ratio lower than this threshold. By means of the genetic matching procedure, we then built a comparable civic group and computed the difference in Active Residuals between the two groups. Next, we reduced the threshold (to 9%, 8% and so on up to 1%) and repeated the matching procedure. Figure 1.1 illustrates. There are two things worth noticing. First, as far as one reduces the threshold in such a way as to select a group of municipalities with a lower share of volunteers over the population, average active residuals go up with respect to those observed in the comparable group built by means of the genetic matching procedure. Second, as the threshold is set at 1%, the difference in active residuals between the civic and uncivic group

is very close to the one found by identifying uncivic municipalities by council dissolution (26% versus 30%). Lowering the threshold further down would reduce the sample below a desirable level.

FIGURE 1.1: Differences in active residuals - Volunteers
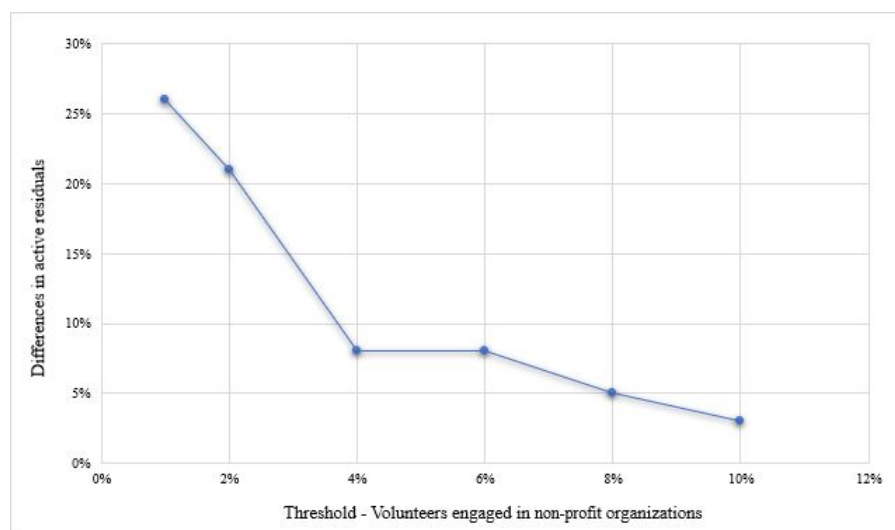
Moreover, setting the threshold at 1%, we investigate the difference between the civic and uncivic groups regarding the level of indebtedness and the quality level of the good publicly provided. Results are shown in the following table.

TABLE 1.2: Results with alternative proxies for civicness - volunteers

Proxy for civicness: Volunteers ($<1\%$)				
	Outcome differences	*p-value*	*Uncivic obs.*	*Civic obs.*
Active residuals	0.2629	0.0070	108	108
Debt_index	0.0015	0.6084	108	108
Level of recycling	-0.0123	0.0531	108	108

Similar results emerge when applying the same procedure to determine the appropriate threshold in voter turnout that helps in discriminating civic municipalities from uncivic.

FIGURE 1.2: Differences in active residuals - Voters turnout in referenda held in 2009
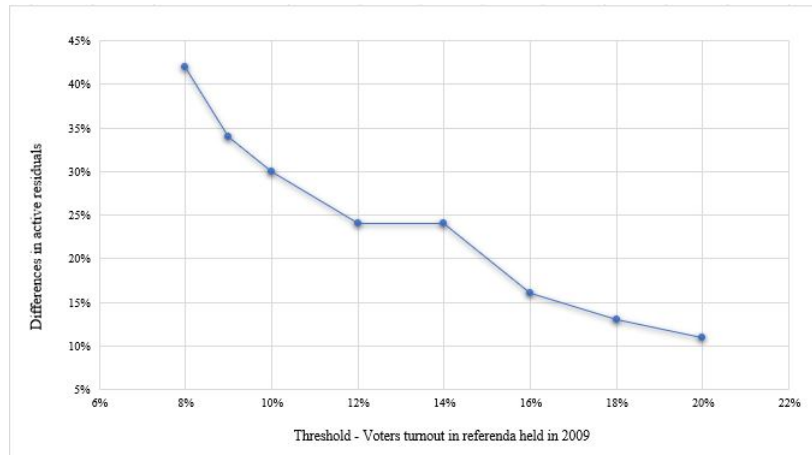
FIGURE 1.3: Differences in active residuals - Voters turnout in referenda held in 2016
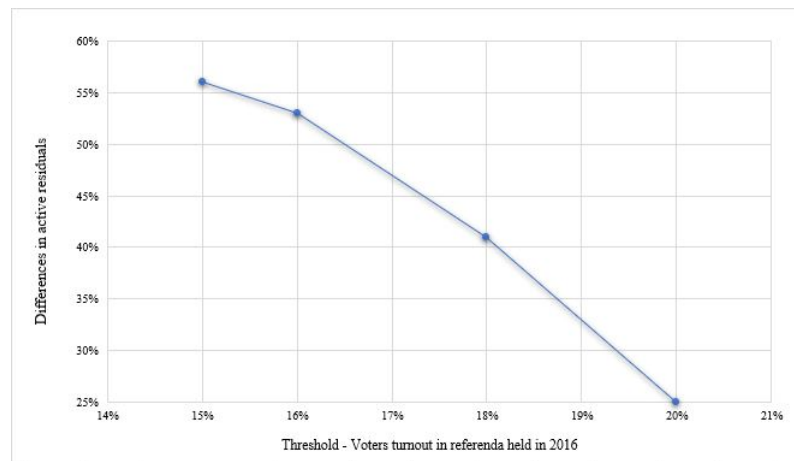
Indeed, as Figures 1.2 and 1.3 show, as we consider municipalities whose turnout was lower and lower, differences in active residuals with a comparable more virtuous group increase.

As far as the voters' turnout in referenda held in 2009 is concerned, we identified a threshold equal to 10%, which gives rise to a difference in active residuals with the more virtuous group of 30%. As for the referendum held in 2016, we set the threshold at 20%. In this case, the difference in active residuals between the municipalities so identified and a comparable virtuous group is close to 26%.

Again, through the Genetic Matching procedure, we also estimate the average differences in the level of indebtedness and the good publicly provided. Results, reported in the Table 1.3, are in line with our theoretical hypotheses. Indeed, uncivic

municipalities reveal a higher level of public debt and a significantly lower level of recycling.

TABLE 1.3: Results with alternative proxies for civicness - voters turnout

	Outcome differences	*p-value*	*Uncivic obs.*	*Civic obs.*
Active residuals				
Voters turnout 2009 (<10%)	0.3020	0.0000	347	347
Voters turnout 2016 (<20%)	0.2583	0.0471	267	267
Debt_index				
Voters turnout 2009 (<10%)	0.0026	0.0491	347	347
Voters turnout 2016 (<20%)	0.0016	0.2657	267	267
Level of recycling				
Voters turnout 2009 (<10%)	-0.1400	0.0000	347	347
Voters turnout 2016 (<20%)	-0.0995	0.0119	267	267

1.5.3 Placebo test

In order to support the view that our results are driven by the quality of the social context , we run a placebo test structured as follows:

i) we remove from the original dataset the group of uncivic municipalities selected in the baseline test (all the municipalities whose council has been dismissed at least once);

ii) we consider the group of municipalities identified as civic in the baseline test, as being uncivic;

iii) we replicate the matching procedure in order to find a comparable group for the group of artificially uncivic municipalities.

If the results in 1.4 were driven by the quality of the social context, rather than by other characteristics, we would not expect significant differences in the level of active residuals. Results are reported in the following Table.

TABLE 1.4: Placebo test

Dependent variable	Outcome differences	p-value	Uncivic obs.	Civic obs.
Active residuals	-0.0947	0.3377	105	105

Table 1.4 includes the main results of the placebo test. There are no statistically significant differences between the *naive civic group* - which is statistically equivalent to the original group of uncivic municipalities - and a group which is comparable to it along all the dimension highlighted above. Notice that the number of observations on which the estimate in Table 1.4 is done (105) is lower than the number of observations in the placebo (132). This depends on the fact that a comparable group is determined by a 1-to-1 matching procedure with replacement. Further estimates (not reported, but available upon request) however show that the same results hold if the 1-to-1 matching procedure is carried out without replacement (so that also in this case the number of observations equal 132).

1.6 Tax enforcement and political competition

In this section, we explicitly link the level of tax enforcement with political competition. In particular, we explicitly address the hypothesis that in municipalities with scarce civic culture the level of tax enforcement is strategically manipulated in order to gain voters' consensus.

To get more clear-cut results, we exploit a regulatory change forcing the Italian municipalities to cancel from the active section of their yearly balance sheet any non-cashable credit. The new regulation was fully in force since 2015, although it was widely announced and implemented in a small sample - about 400 - municipalities since 2012-2014 (e.g. Bassetti, 2017). Its provisions have entailed a mechanical and unavoidable reduction of active residuals.

The discrepancy between the announcement of the new regulation and its implementation offers us a possibility to test the link between tax enforcement and political competition. Indeed, in the years between the announcement of the reform and

its implementation - when it was clear that the new provisions would have placed harsher constraints on the possibility of balancing the budget by referring to sums that would have never been cashed - in municipalities where elections were held, politicians had the last chance to strategically set the level of enforcement. With the introduction of a stricter fiscal discipline in 2015, a milder tax enforcement - hence higher active residuals - implies a reduction in the municipal fiscal capacity (expenditures must be lowered in such a way as to equate expected revenues, given that a share of credits must be cautiously placed in a different section of the budget and cannot be used to fund expenditures). Thus, we expect that in poor social context, elections held immediately before 2015, stimulated local politicians to take advantage of the last chance to promise or implement lower tax enforcement.

We adopt a Difference-in-Difference (DiD) approach which compares differences in active residuals between civic and uncivic municipalities, distinguishing the group of municipalities in which elections were held from the group in which elections were not held.

We rely on the following model:

$$ActiveResiduals_i = \beta_0 + \beta_1 Civicness_i + \beta_2 Election_i + \beta_3 Civicness_i * Election_i + \epsilon_i$$

$$(1.4)$$

where: the variable *Civicness*) takes value one when the level of civic culture is low (zero otherwise); the variable *Election* takes value one if there was at least one municipal election in the period 2013-2015; ϵ_i is the error term.

We estimate three DiD models, according to the different proxies for civicness previously used. The association between civic and uncivic municipalities was carried out using the genetic matching procedure, as in the baseline tests.

To catch the meaning of the coefficients in (1.4), let $\overline{X}_{\overline{C},\overline{E}}$ indicate average active residuals when the variable *Civicness* equals $\overline{C} = (0,1)$ and the variable *Election* equals $\overline{E} = (0,1)$. Then we have:

$$\hat{\beta}_0 = \overline{X}_{00}, \hat{\beta}_1 = \overline{X}_{10} - \overline{X}_{00}, \hat{\beta}_2 = \overline{X}_{01} - \overline{X}_{00}, \hat{\beta}_3 = \overline{X}_{11} - \overline{X}_{10} - (\overline{X}_{01} - \overline{X}_{00})$$

Thus $\hat{\beta}_3$ - the coefficient associated to the interaction term - captures the DiD effect of interest. Results, summarized in Table 1.5, generally confirm our hypothesis.

Model (1) estimates the impact of elections on the averages level of active residuals between municipalities that have faced or not council dismissal due to Mafia infiltration. The interaction term, $Civicness_i * Election_i$, is positive and confirm our hypothesis at a statistical significance level of 10%. Thus, dissolved municipalities with at least one municipal election over the period 2013-2014, have, on average, a higher level of active residuals, compared to municipalities without elections.

In model (2) we rely on the average level of voter turnout between referenda held in 2009 and in 2016 as proxies for catching civicness. We evaluate variable's distribution and set a threshold equal to 20% (as in the baseline tests). So, the dummy variable $Civicness_i$ takes value 1 for municipalities with a level of voter turnout lower than this threshold. Again, the interaction term is positive and results are in line with our theoretical hypotheses.

TABLE 1.5: Elections and active residuals (robust s.e.).

	Dependent variable:		
	Active Residuals		
	(1)	(2)	(3)
	Council dismissal	Voter turnout	Volunteers
Constant	0.917***	0.660***	0.807***
	(0.057)	(0.035)	(0.137)
Civiness	0.162*	0.275***	0.427***
	(0.089)	(0.048)	(0.161)
Election	−0.067	−0.100**	−0.139
	(0.076)	(0.043)	(0.168)
Civiness*Election	0.221*	0.124*	0.027
	(0.121)	(0.065)	(0.200)
Observations	237	1017	155
R^2	0.088	0.110	0.137
Adjusted R^2	0.076	0.108	0.120
Residual Std. Error	0.480	0.510	0.547
F Statistic	7.482***	41.946***	8.000***

Note: $^*p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

In the last model, we run the DiD model identifying as bad social contexts municipalities with a level of volunteers lower than 1% (as in Section 1.5.2). Although all coefficients show the expected sign, the interaction term is not statistically significant. We believe that a possible reason for this is to be found in a sample size which is too small for the effect of interest to be identified.

As a more general point, this evidence also suggests that elections not always represent a disciplinary event for policy makers. In bad social contexts, political competition triggered by elections can lead to implement budgetary policies that

increase the debt of the municipality without improving the quality of the goods that are being publicly provided.

1.7   Concluding remarks

In this paper we have considered how poor civic culture makes enforcement about tax compliance an instrument for political competition. Our theoretical analysis has merged insights from different strands of literature, providing sound theoretical predictions that find support in the empirical evidence. As we have shown, in municipalities characterized by poor civic culture, scarce tax enforcement is a way to gain political consensus. These municipalities are so characterized by greater tax evasion, higher municipal debt and a lower quality of the goods publicly provided. Our estimates point out that in uncivic municipalities, identified as poorly endowed with civic culture according to different criteria, active residuals are 30% higher; the provision of public goods is 10% lower and the debt indexes are 2% higher. Comparison has been made with respect to a group of municipalities selected through a genetic matching procedure delivering units statistically equivalent along all the relevant demographic and socio-economic dimensions.

Chapter 2

Municipal financial distress and quality of the social context

[1]

2.1   Introduction

Local governments financial distress is an increasingly prominent issue in many countries (e.g. Jones and Walker, 2007; Lobo, Ramos, and Lourenco, 2011; Winarna, Widagdo, and Setiawan, 2017). The reason is twofold. First, financial distress at a local level can be the cause of public finance tensions at the national level. Second, municipal financial distress commonly reduces the bundle of publicly provided goods, causing disparities in access to services between citizens of different municipalities.

Local government's financial distress is generally defined as a condition of severe financial imbalance prolonged over time. In this situation, municipal revenues are not sufficient to meet all the commitments the municipality has towards third parties.

The economic literature investigating the problem of financial distress is structured in two main strands: one examines the possibility of building up a sound methodology to assess the evolution of the municipal financial situation e.g. Brown, 1993; Kloha, Weissert, and Kleine, 2005; García-Sánchez et al., 2012; Rossi, Zito, and Costanzo, 2012; Cohen, Costanzo, and Manes-Rossi, 2017; the other is prevalently concerned with the determinants of distress, providing empirical evidence that this is the outcome of several budget-related factors combined together (e.g. Pammer, 1990; Jones and Walker, 2007; Brusca, Rossi, and Aversano, 2015; Winarna, Widagdo, and Setiawan, 2017).

Overall, the literature at hand has mainly taken an accountant perspective. Such perspective, in principle, should help in using the balance sheet information to assess the risk of distress. Indeed, great relevance is being attributed to the indebtedness cost indicators and the local government's capacity to repay debts.

In this paper we assume a different perspective. We focus on the mechanisms behind an adverse evolution of the budget components leading to distress. In particular, we investigate the role played by socio-economic factors, investigating whether these factors influence the risk of distress via their impact on political competition. Our focus is on Italian municipalities. This is a particularly interesting case, for the Italian municipal debt currently equals 38 billions of euro. These debts would exacerbate the problems related with the management of the state debt in case of bailing

out.

In a companion paper, we have shown that in municipalities characterized by scarce civic culture - where voters are poorly motivated and compliance with social norms of cooperative behaviour is weak - strategic considerations induce politicians to set the level of tax enforcement at a sub-optimal level. Scarce civic culture at the municipal level is then associated with lower tax enforcement and a higher municipal debt. As the probability of distress increases with debts, it seems plausible to conjecture that such a probability is affected by the quality of the social context.

Our conjecture about the link between the quality of the social context (here identified as the strength of civicness) and the probability of municipal financial distress is supported, in general, by an important strand of the political economics literature (**tabellini**; e.g. Nannicini et al., 2013) stressing the consequences that low levels of civicness may have on politicians' ability to extract rents. In a word, the lower the share of civic-minded voters in electoral districts, the less severe presumably is the punishment for policy makers' misbehaviour ; political representatives are less likely to be selected on honesty and general competence criteria. Public finance mismanagement may follow.

We directly test the link between the quality of the social context and the probability of financial distress by considering the universe of Italian municipalities. To identify municipalities in which civic culture is scarce, we rely on different (popular) measures of civicness, such as voter turnout in referenda and the number of volunteers engaged in non-profit organisations at the municipal level (**putnam93**). We also take advantage of the Italian Law 221/1991, which governs municipal council dismissal whenever Mafia-type organisations capture elected local officials. We use the status of dissolved municipal council (at least once) as a signal to identify municipalities characterised by poor civic culture, where voters are poorly motivated and compliance with social norms is weak (e.g. Beraldo et al., 2017). By resorting to regression and cluster methods, we investigate whether socio-economic factors influence the risk of financial distress. We control for the main budget indicators pointed out by the relevant literature. As expected, the quality of the social context is significant in affecting local governments' default probability. More broadly, results suggest that more deprived municipalities - in terms of civic-mindedness and

economic conditions - are more prone to financial distress. The paper is organised as follows. Section 2 provides information about the institutional context we analyse and the municipal financial distress procedure. Section 3 discusses our empirical strategy and provides an exploratory analysis of the data. Results are discussed in Section 4. In Section 5 we provide a cluster analysis. Conclusions are drawn in Section 6.

2.2   The institutional context

Italy is an example of a highly decentralized country, with three subnational governments (regions, provinces, municipalities). Each municipality has its local government organization made of: a mayor, who holds the executive power at the municipal level; an executive body, appointed by the mayor; an elected council.

Since the 1990s, legislative activity has devoted considerable breadth to the issue of administrative and fiscal decentralization [2]. The increased decentralization allowed municipalities to have complete control over a wide range of essential public services such as waste management, local police, town planning, culture and economic development. Indeed, municipalities now enjoy large autonomy and manage around 8% of total public expenditure.

Current expenditure is financed by municipal fiscal revenues (which come essentially from local taxes and fees) plus transfers from the central government; borrowing is allowed only to finance investment expenditures and is subjected to strict quantitative limits.

Notice that the Italian Constitution has embedded the so-called *golden rule*, which requires local governments to incur long-term debt for capital projects. So it is not possible to finance current expenditure by increasing municipal debt. The constitutional reform, carried out by Law n. 1/2012, which introduced the principle of budget balance for all the public administrations, set further constraints on local authorities regarding debt levels, which overlap with those established by the article 119 of the Italian Constitution. The limit is represented by the impact of interest

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[2]with Law n. 142/1990 (merged into Legislative Decree n. 267/2000), which dictated the new system of local autonomies, and with Law n. 81/1993, relating to the direct election of the mayor and the president of the province

costs on local authorities' current revenues. In particular, Article 204 of the Legislative Decree n. 267/2000 (Testo Unico Enti locali, TUEL) dictates that the local authority can take on new mortgages and access other forms of financing available on the market, only if annual interest payments do not exceed a given percentage of current revenues. This reference percentage has been steadily reduced over time to 6%. Moreover, municipalities can borrow new debt only if the total amount of debt service paid on past and new debts does not exceed 15% of current revenues of the two previous years. The majority of debt is granted by the so-called *Cassa Depositi e Prestiti*, a state-owned body that operates to promote national and local governments' investment projects.

These kinds of provisions are consistent with the legislator's aim, which is to ward off events of local authorities' severe financial crisis and distress.

2.2.1   Municipal financial distress: law and procedure

There was a regulatory vacuum on local governments financial distress until 1989. However, the spread of this kind of event on a national scale made it necessary to introduce an *ad hoc* legislation aimed at recognizing and regulating the case of local governments financial distress. The Legislative Decree of 2 March 1989 n.66, later converted into Law n.144, appears as a specific *bankruptcy procedure* for local authorities, to be applied when the municipality does not have the economic resources to fulfil legal obligations it has incurred with third parties or when the institution does not have the financial means needed to carry out functions and services that are essential for citizens.

The original regulation established that the settlement of past debts and the subsequent restart of public functions had to go through taking out a mortgage with the *Cassa Depositi e Prestiti* to acquire the necessary liquidity to face the emergency. The aim of the legislator was twofold: (i) to establish a (pseudo) sanctioning procedure; (ii) to provide rebalancing procedures for local authorities' bankruptcy. These kinds of provisions proved not very efficacious. First, the reorganization cost (expenses for recovery) was entirely borne by the State, the only subject entitled to settle the obligations incurred by provinces or municipalities towards the *Cassa Depositi e Prestiti*. Second, omitting to point out a rebalancing path for the municipal budget, was not

charged with any sanction.

An intense regulatory evolution followed. The goal was to reform the rules in such a way as to increase the pressure on local governments. This was done by redefining the hypotheses of bankruptcy and the procedures for re-establishing the administration's accounts.

Currently, the regulation can be found in the Legislative Decree 267/2000 (TUEL; TITLE VIII - Legislative Decree 267/2000 bankrupted local authorities: general provisions). Art.244 asserts that *financial distress occurs when the entity, municipality or province, is no longer able to perform its essential functions and provide due services, or when it is no longer able to settle debt to third parties through the ordinary means of restoring fiscal balance or after recognizing the debts that have not been included in the balance sheet.* An Extraordinary Board (Organo Straordinario di Liquidazione - hereafter OSL) is appointed by the central government (based on suggestions from the Ministry of Domestic Affairs) after the declaration of distress. It is made of a single commissioner for municipalities with a population of up to 5000 inhabitants; for municipalities with over 5000 inhabitants and provinces, instead, the OSL is composed of three members. The OLS tasks are: (i) computes debts; (ii) determines and manages the financial resources available for recovery, including transfer of assets; (iii) meets the liabilities. Meanwhile, the municipality's institutional bodies have to achieve a stable financial condition by removing the structural causes of financial destabilization.

The local authority council adopts the resolution containing the formal and explicit declaration of financial distress, according to art.244, and evaluates the causes that led to the instability. The resolution of the state of instability cannot be revoked. A detailed report by the economic and financial auditing body, which analyses the causes of failure, is attached to the declaration of financial distress. No executive action can be taken against the municipality for debts that fall within the OLS competence. From that time on, the unpaid debts and the sums due for cash advances no longer produce interest, nor are they subject to monetary revaluation. Financial distress resolution and the OLS report are sent to the Ministry of the Interior and the Regional Prosecutor at the competent Court of Auditors for the area, five days

from the date of enforceability. While the OSL is active, the municipality draws up a hypothetical rebalanced budget, achieved by activating its revenues and reducing current expenses. The local authority council provides for the approval of the rebalanced budget, with a deadline of 3 months from the appointment date of OSL.

Concluding, the declaration of financial distress has a strong impact on the local community. Tax and services fees have to be raised to the maximum levels allowed by Italian law, while politicians are required to cut off expenses and proceed in all necessary actions to remove the causes of financial imbalance. Furthermore, the number of employees must be reduced, and new recruitments are not allowed before restoring financial equilibrium. Thus, local governments financial distress causes damage to citizens welfare - a lower bundle of publicly provided goods and higher tax level - and pressure over politicians who have to reduce expenses and might implement policies that lower voters consensus.

2.3   Related literature

As emphasised in Section 2.1, the economic literature investigating the problem of local governments' financial distress has assumed an accountant perspective. Upon revising this literature, it is revealed that there was great relevance to the indebtedness cost indicators and the local government's capacity to repay debts. Borrowing costs - payments for debts and interest - are in recurring use. For example, interest-bearing debt, both over total current revenues and total current expenditure, is a typical source of insolvency used in the literature. The idea is that the more significant the portion of revenues that has to be devoted to the coverage of interest obligation, the higher the risk of default (Cohen, Costanzo, and Manes-Rossi, 2017; Rossi, Zito, and Costanzo, 2012). Simultaneously, for capturing the size of the public sector and the capacity to cover debt costs, the literature takes into account a series of indexes, for example, the ratio between current revenue and total spending, the ratio between tax revenues and current spending, the difference between total revenues and total expenditure divided by total revenues. Then, some indicators of public

spending rigidity are also considered, i.e. the ratio between personnel spending and current revenues or current spending.

Overall, the economic literature has empirically tested whether the information presented in local governments balance sheets has a predictive ability for financial distress. Thus, the novelty of our work is the perspective from which we analyse the issue. Indeed, we try to understand if the civic level within the municipal area influences how some budget items evolve, via its impact on political competition.

Table B.1 in Appendix shows a small recap of the principal balance sheet information used by literature. The explanatory variables used in our empirical analysis, instead, are exhaustively described in Section 2.4.1 and Table B.2 in Appendix.

2.4　Empirical analysis

In this section, we carry out our empirical analysis. First, we describe the data and sources; then, our empirical strategy is presented. Results are discussed in Section 2.5.

The empirical strategy is simple. We exploit a logistic regression to investigate whether the quality of the social context affects the probability of local governments financial distress.

To identify municipalities characterized by scarce civicness, we rely on the proxies suggested by the literature on civic culture. Putnam suggested individual voluntarism and electoral participation in his classic book *Making Democracy Work* as forms of civic engagement. They catch the willingness of citizens to participate in the life of a community in order to improve conditions for others or to help shape the community's future (Adler and Goggin, 2005).

As a further way to identify scarce civicness, we consider municipalities in which ties are detected between elected local politicians and criminal organizations. Indeed, the Italian legal system (with Law 221/1991) allows the dissolution of municipal council whenever the Judicial authorities have strong reasons to believe that Mafia-type organizations capture elected local officials. The dissolved council is then substituted by a commissioner appointed by the central government, who runs the municipality for a maximum of 18 months, up to the next elections. As a result of the

Law's application, 599 municipal councils were dissolved from 1991 to November 2021, in some cases repeatedly over the years.

By changing the variable proxying for the level of civic-mindedness, we estimate three different models (as we better explain in Section 2.4.3). This approach reduces the risk that results are driven by the choice of a particularly favourable - but unreliable - indicator for scarce civicness.

2.4.1 Data

The empirical analysis merges different sources of information. It draws on a rich dataset, describing many relevant features of each of 7039 (over 7903, about 90%) of Italian municipalities, over the period 2001-2013 [3]. A set of municipal demographic and socio-economic variables, provided by the Italian National Institute of Statistics and by Statistical Atlas of Italian municipalities (ISTAT, ASC), are included in the dataset.

According to the literature, we consider municipal population density, *Popdens*. Indeed, variables such as resident population, municipal surface or population density are often contemplated in the analysis of the drivers for local governments financial distress (e.g. Capeci, 1994; Winarna, Widagdo, and Setiawan, 2017; Lobo, Ramos, and Lourenco, 2011; Rossi, Zito, and Costanzo, 2012). These demographic variables can be interpreted both as a factor for reducing the probability of default (higher resident population means higher tax revenues) and, on the contrary, as one of the determinants of financial distress (because they catch the size of users/municipal area to which local authority must provide goods and services).

To better understand local entities' financial health, we also investigate the role of socio-economic factors in explaining default probability. Indeed, changes in the socio-economic conditions such as the employment/unemployment rate (Rossi, Zito, and Costanzo, 2012), or municipal firms density (Lobo, Ramos, and Lourenco, 2011), or income per capita or poverty (Ziolo, Porada-Rochon, and Szaruga, 2017), influence financial distress. Thus, we rely on data about municipal employment rate,

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[3] We omitted from the analysis only those municipalities for which reliable data are not available, in many cases because of the merger processes in which they were involved

EmplRate, as a proxy for municipal economic development, and on the share of families with more than three members, *HouseSize*, as a proxy for municipal poverty level. Indeed, as shown in Table B.3, there is a correlation between household size and relative poverty rate: the greater the size of the family unit (in particular, from 5 to more members), the greater the percentage of families that fall into a state of relative poverty.

For catching civicness, we select three different proxies at the municipal level. In the baseline analysis, to capture the quality of the social context, we rely on the share of people employed as volunteers in non-profit organizations (*Volunteers*). Municipal data about the total number of volunteers are made available by the Itaian Statistical Office (ISTAT) website. Then, we collect data about two referenda to provide additional evidence that this proxy plausible reflects the level of civicness. Information about electoral participation is provided by the Ministry of Domestic Affairs' website. In particular, we selected two referenda, quite unable to trigger participation based on self-interest, so voter turnout is more likely to reflect civic engagement. One of these referenda was held in 2009. It aimed at repealing specific provisions of the electoral Law. The other, held in 2016, was on the proposed repealing of a law that allows gas and oil drilling concessions extracting hydrocarbon within 12 nautical miles of the Italian coast to be prolonged until the exhaustion of the useful life of the fields. In both referenda, the overall participation was very scant. So, we compute the average voter turnout between these two referenda at a municipal level and use it as a proxy for civicness (*VoterTurn_mean*). Finally, we build a dummy variable, *Dissolution*, that takes value one in the case of municipalities that have faced at least one council dismissal due to Mafia infiltration during the reference period.

We also collect data on various balance sheet items to verify whether the effects exerted by the composition of the expenditure of local authorities on the probability of financial distress persists. We rely on some widely accepted budget indicators in the literature. The Ministry of Internal Affairs has published the data on the municipal budget items, and they are available on the Bureau Van Dijk (AIDA PA) platform.

The municipal debt level is captured by using information concerning the incidence of debt interest payments over total current revenues (*Int_Rev*). Interest-bearing debt is a typical source of insolvency used in the literature. The more significant the portion of revenues that has to be devoted to the coverage of interest obligation, the higher the risk of default (Cohen, Costanzo, and Manes-Rossi, 2017; Rossi, Zito, and Costanzo, 2012). In line with (Gregori and Marattin, 2019), we introduce a kind of residual index (i.e. active residuals over total revenues). Active residuals are sums the municipality should have cashed in the past, did not cash, but that it declares to expect to cash in the future. Thus, it signals the effort by local governments to enforce tax compliance, what is likely to affect the probability of distress.

To take into account the size of the public sector, we also include a municipal current spending index (i.e. the ratio between current revenue and total spending, *Rev_Exp*), and an autonomy index, computed as the ratio between tax revenues and current spending (Gregori and Marattin, 2019).

We also consider an indicator of public spending rigidity, i.e. the ratio between personnel spending and current revenues (*PersExp_Rev*): the higher the proportion of personnel expenses to revenues, the lower the resources available to other operating expenses. Thus, this would contribute to financial strain as salary expenses are rather inflexible (Rossi, Zito, and Costanzo, 2012).

The literature considers costs of providing services as a measure for local governments financial distress (such as total costs for local infrastructure (Jones and Walker, 2007)), as distressed municipalities are no longer able to perform their principal functions and to provide services due to citizens (Gregori and Marattin, 2019). Thus, we also consider the ratio of service expenditure over total expenditure *ServExp_TotExp*.

As a dependent variable, we introduce a dummy variable, *Distress*, which takes value one if the municipality faced at least one financial distress during the period 2001-2013 (84 municipalities). The Ministry of Domestic Affairs provides data. Table B.2 in the Appendix details all the variables.

2.4.2 Exploratory analysis

In this section, we provide an exploratory analysis of our data.

As a first step, we investigate the correlation between variables contemplated in the empirical analysis. The upper triangular correlation matrix, represented in Figure B.1, is built by considering the universe of municipalities in the dataset. It reveals that the selected variables are sufficiently uncorrelated to each other. Furthermore, our dependent variable is uncorrelated to each covariate.

Then, we inspect the yearly distribution of municipal financial distress in Italy from 2000 to 2018. The number of defaults increased during the Great Recession. As Figure 2.1 shows, there has been a significant increase during the period 2008-2013, from 3% to 10% of municipal financial distress.

The period preceding the Great Recession reveals a limited number of episodes of financial distress, especially after 2002. Indeed, a regulatory change regarding the repayment of the debt of distressed local entities was introduced with Law n.289/2002. After that Law, the financial costs related to loans are no longer assumed by the central government, and local governments are obliged to repay - on their own and in total - all costs related to financial distress. As a result, the number of local governments declaring financial distress reduced. However, it favours the phenomenon of local governments improper data report in their balance sheet to hide their financial difficulties (Corte dei Conti, 2014).

A seemingly inversion of the trend is observed during the two years 2014-2015, following which we are again witnessing a net increase in episodes of financial distress. This may be due to a relevant regulatory change forcing the Italian municipalities to cancel from the active section of their yearly balance sheet any non-cashable credit. The new regulation was entirely in force since 2015, although it was widely announced and implemented in a small sample - about 400 - municipalities since 2012-2014 (e.g. Padoan, 2014). Its provisions have entailed a mechanical and unavoidable reduction of active residuals. Thus, it has placed harsher constraints on the possibility of balancing the budget by referring to sums that would have never been cashed.

FIGURE 2.1: Municipal financial distress - by year
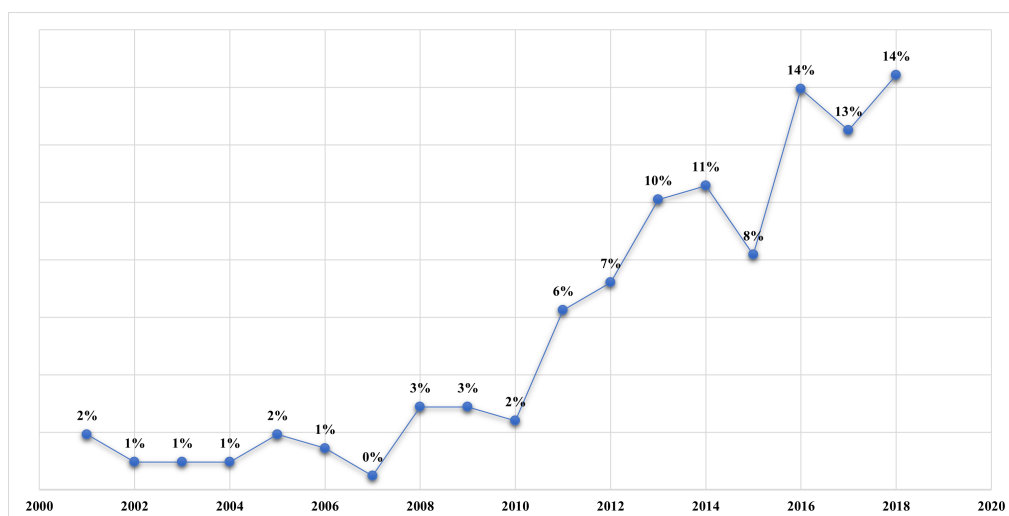
Source: our elaboration.

However, our analysis focuses on Italian municipalities that have experienced the financial distress over the period 2001-2013. The final database relies on 84 cases of local default.

As Table 2.1 reports, they mainly occurred in municipalities in the centre-south Italy: the 94% of local governments financial distresses are concentrated in central and southern Italian regions, with more than 50% concentrated in Campania and Calabria.

TABLE 2.1: Top five regions and provinces

Regions	N. distress	% distress	Provinces	N. distress	% distress
Campania	24	29%	Caserta	14	17%
Calabria	23	27%	Reggio Calabria	8	10%
Lazio	11	13%	Frosinone	5	6%
Sicilia	10	12%	Crotone	5	6%
Abruzzo	4	5%	Catania	5	6%

Source: our elaborations on data provided by the Ministry of Domestic Affairs.

Coherently with the regional distribution of the phenomenon, Table 2.1 shows the five Italian provinces recording the highest percentage of municipal financial

distress, among which the provinces of Caserta and Reggio Calabria display the highest levels (respectively 17% and 10%).

2.4.3   Model specification

As emphasized above, we aim at testing the role of civicness in increasing the probability of local default. For this purpose, a logistic regression approach has been exploited.

Our dependent variable, *Distress*, is a local default indicator based on data from the Ministry of Domestic Affairs, and referred to the period 2001-2013. It assumes the following values:

$$
Distress_i = \begin{cases} 1, & \text{if a municipality } i \text{ has declared financial distress} \\ 0, & \text{otherwise} \end{cases}
$$

The literature does not employ a unique definition of local fiscal distress, which is often country-specific: a local government is considered to be distressed whenever it enters the conditions disciplined by national laws due to its inability to fulfil its existing financial obligations (Lobo, Ramos, and Lourenco, 2011). Following the Italian Court of Auditors, in this work, we posit that a municipality is in financial distress when its council votes a default resolution, an event which is specifically disciplined by the Italian Law (as specified in Section 2.2.1).

The generic form of the implemented logit model can be expressed as follows:

$$
Distress_i = \alpha + \beta Civicness_i + \gamma X_i + \tau B_i + \epsilon_i \tag{2.1}
$$

where $i = 1, ..., N$, X_i is a matrix of demographic and economic variables characterizing municipality i; B_i is a matrix of municipal budget indicators and ϵ_i is the error term. β, γ and τ are the vectors of parameters to be estimated.

The term of greater interest is β. It captures the effect of civicness, i.e. the quality level of municipal social context, on the probability of local government financial distress. As mentioned in Section 2.4.1, we rely on three different proxies for catching

civicness. Thus, we replace *Civicness$_i$* in the logit model as:

$$\begin{cases} \text{- the share of people engaged as volunteers in non-profit organizations;} \\ \text{- the average voters turnout in referenda held in 2009 and in 2016;} \\ \text{- a dummy which takes value 1 if } i \text{ has faced at least one council dismissal} \end{cases}$$

According to these proxies, we run three logit models. The response variable *Distress$_i$* is the default indicator. It is dichotomous coded 1 for distress condition, and 0 otherwise. We use the values of the explanatory variables at time t=2001, and investigate whether and how civicness affects the probability of municipal financial distress thereafter (2002-2013); we control for economic and demographic conditions and municipal budget indicators over the reference period. Results are discussed in the next Section.

2.5 Results

This Section describes the results delivered by the logistic regression models, as discussed in Section 2.4.3. For each proxy capturing civicness, we first consider a simple bivariate regression (column (1) in Tables 2.2, 2.3, 2.4) to evaluate its effect on the probability of default in the absence of any other factor. Then other regressors are added. First those capturing demographic and economic conditions at the municipal level. Then those related with budget management.

Table 2.2 shows the results of the logit model when we rely on the share of citizens employed as volunteers in non-profit organizations as a proxy for catching civicness.

TABLE 2.2: Probability of municipal financial distress - volunteers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Dependent variable:					
					Distress					
Volunteers	−0.259***	−0.265***	−0.248***	−0.143***	−0.140***	−0.136***	−0.132***	−0.132***	−0.133***	−0.114***
	(0.038)	(0.040)	(0.043)	(0.042)	(0.043)	(0.042)	(0.042)	(0.041)	(0.041)	(0.044)
Popdens		−0.0001	−0.0003*	−0.0003**	−0.0003**	−0.0003**	−0.0003**	−0.0003**	−0.0003**	−0.001**
		(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0003)
HouseSize			4.720***	4.880***	4.996***	5.070***	5.324***	5.429***	5.441***	8.427***
			(1.543)	(1.464)	(1.534)	(1.527)	(1.498)	(1.509)	(1.511)	(2.392)
EmplRate				−0.103***	−0.102***	−0.098***	−0.095***	−0.079***	−0.078***	−0.106***
				(0.017)	(0.018)	(0.018)	(0.019)	(0.021)	(0.020)	(0.026)
Int_rev					10.604***	10.831***	10.512***	10.021***	9.989***	22.170***
					(2.644)	(2.640)	(2.648)	(2.753)	(2.774)	(6.733)
Active_residuals						0.220***	0.218***	0.207***	0.206***	0.263*
						(0.060)	(0.060)	(0.062)	(0.062)	(0.147)
ServExp_TotExp							−1.167	−0.826	−0.774	−2.166
							(1.403)	(1.445)	(1.467)	(1.886)
Rev_Exp								−2.103	−2.101	0.0001
								(1.725)	(2.426)	(0.004)
Autonomy_index									−0.198	−0.753
									(1.674)	(1.672)
PersExp_Rev										1.476
										(2.402)
Constant	−3.320***	−3.293***	−5.646***	−2.374***	−2.650***	−3.096***	−3.041***	−3.355***	−3.331***	−4.061**
	(0.216)	(0.227)	(0.897)	(0.833)	(0.869)	(0.833)	(0.842)	(0.832)	(0.838)	(2.056)
Observations	6,871	6,782	6,782	6,782	6,778	6,777	6,777	6,777	6,752	2,303
Log Likelihood	−270.654	−260.691	−257.010	−242.548	−239.789	−237.993	−237.610	−236.578	−236.073	−104.045
Akaike Inf. Crit.	545.308	527.383	522.020	495.095	491.578	489.986	491.221	491.157	492.146	230.090

Note:　　　　*p<0.1; **p<0.05; ***p<0.01. Robust standard error

Results sharply suggest that budget indicators are not the only determinants in explaining the probability of municipal financial distress. An interesting point comes to light from the estimates: the composition of public spending and, more

broadly, the budget indicators used in the literature are not always significant in explaining the probability of local governments financial distress. Municipalities' structural features make them more likely to experience financial distress. As we expected, the quality of the social context significantly affects the default probability: ceteris paribus, a lower level of civicness increases the probability of financial distress.

To better understand the overall effect of the context on financial distress exposure, we also investigate the role of socio-economic factors. We consider the municipal employment rate and the share of families with more than three members. We rely on the latter variable as a proxy for catching municipal relative poverty levels. Table B.3 in Appendix reports, over our reference period, the strong correlation between households size and poverty, at national level [4]. Results confirm that more deprived municipalities are more prone to incur financial distress. We find that a higher employment rate reduces the default probability (coherently with (Lobo, Ramos, and Lourenco, 2011) results, using firms density), while municipalities characterized by a higher poverty rate are more likely to face financial distress.

According to the literature, public service spending strongly depends on population and municipal area size: municipalities with higher population density are much more likely to face financial distress because they need more resources to provide goods and services (e.g. Lobo, Ramos, and Lourenco, 2011; Winarna, Widagdo, and Setiawan, 2017). However, results in Table 2.2 points out a different scenario: we find that municipal population density has a positive effect in reducing the probability of default (as in (Rossi, Zito, and Costanzo, 2012)); while, in contrast, per capita spending in public services shows no statistically significant effect in explaining a municipality's probability of financial distress.

It is relevant to note that almost all the balance sheet items used are not statistically significant. Regarding the personnel index, the literature suggests that a higher proportion of personnel expenses to revenues reduces the resources available for other operating expenses. Thus, this would contribute to financial strain as salary expenses are relatively inflexible (Rossi, Zito, and Costanzo, 2012). However, we find no statistical significance for the personnel index, even if we scale personnel

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[4]The correlation persists even when we look at the data by macro-areas (North, South, Center)

spending by current expenditure (as in (Gregori and Marattin, 2019)). Similar considerations apply regarding the ratio of service expenditure over total expenditure and the autonomy index.

As (Gregori and Marattin, 2019), we introduce a residual index (i.e. active residuals over total revenues). Active residuals are sums the municipality should have cashed in the past, did not cash, but declared to expect to cash in the future. Thus, a higher level of active residuals signals a lower effort level by local governments to enforce tax compliance affects the probability of distress. As we expected, the residual index significantly affects the default probability. Municipalities seem to be on the default path when they are incapable of collecting resources needed to perform their principal functions and face loan repayment costs. Interest-bearing debt is a typical source of insolvency used in the literature (e.g. Cohen, Costanzo, and Manes-Rossi, 2017; Rossi, Zito, and Costanzo, 2012). In line with the literature, results in Table 2.2 highlight that the larger the portion of revenues that has to be devoted to the coverage of interest obligation, the higher the risk of bankruptcy.

Above all, our results do not confirm what previous literature has pointed out on the determinants of local governments financial distress. Instead, what emerges is that more deprived municipalities are more prone of being declared in financial distress.

Similar thoughts about the results reported in Table 2.3. We replicate the logit model using the average share of voters turnout between referenda held in 2009 and 2016 as proxies for the quality of the social context. In line with our assumptions, the coefficient associated to *Civicness* is statistically significant and contributes in explaining the probability of local government financial distress.

TABLE 2.3: Probability of municipal financial distress - voters turnout in referenda

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Dependent variable:					
					Distress					
VoterTurn_mean	−0.083***	−0.084***	−0.076***	−0.036*	−0.036*	−0.036*	−0.035*	−0.032*	−0.033*	−0.045**
	(0.031)	(0.031)	(0.028)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.023)
Popdens		0.0001	−0.0002*	−0.0003**	−0.0003**	−0.0003**	−0.0003**	−0.0003**	−0.0003**	−0.001***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0003)
HouseSize			7.738***	6.958***	7.123***	7.227***	7.458***	7.494***	7.387***	10.145***
			(1.586)	(1.286)	(1.335)	(1.312)	(1.272)	(1.291)	(1.292)	(2.072)
EmplRate				−0.117***	−0.116***	−0.112***	−0.108***	−0.097***	−0.098***	−0.114***
				(0.014)	(0.015)	(0.015)	(0.016)	(0.018)	(0.018)	(0.022)
Int_rev					10.355***	10.569***	10.273***	9.930***	9.776***	22.207***
					(2.836)	(2.802)	(2.733)	(2.858)	(2.860)	(6.638)
Active_residuals						0.209***	0.203***	0.196***	0.192***	0.272*
						(0.054)	(0.054)	(0.055)	(0.056)	(0.140)
ServExp_TotExp							−1.330	−1.112	−1.102	−2.552
							(1.391)	(1.419)	(1.422)	(1.972)
Rev_Exp								−1.465	−2.287	0.001
								(1.518)	(2.374)	(0.004)
Autonomy_index									0.753	0.186
									(1.590)	(1.503)
PersExp_Rev										0.841
										(2.218)
Constant	−2.920***	−2.970***	−6.824***	−2.852***	−3.133***	−3.601***	−3.501***	−3.755***	−3.737***	−4.233**
	(0.715)	(0.705)	(1.108)	(0.880)	(0.910)	(0.871)	(0.889)	(0.867)	(0.870)	(1.848)
Observations	7,039	6,948	6,948	6,948	6,944	6,943	6,943	6,943	6,917	2,373
Log Likelihood	−289.650	−279.178	−269.401	−247.700	−244.706	−242.943	−242.445	−241.873	−241.350	−106.161
Akaike Inf. Crit.	583.299	564.356	546.801	505.399	501.413	499.886	500.889	501.746	502.700	234.322

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard error

Results confirm that the main budget indicators positively affecting the default probability are the share of interests for loan repayment over total current revenues

and the level of active residuals over total revenues. However, municipalities characterized by scarce civicness, lower employment rates and higher relative poverty rates seem more prone to financial distress. This evidence supports our assumptions.

Finally, we estimate local governments financial distress probability relying on council dismissal due to Mafia infiltration as a measure of civicness. Results are reported in the following table.

TABLE 2.4: Probability of municipal financial distress - council dismissal

					Dependent variable:					
					Distress					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dissolution	2.432***	2.452***	2.041***	0.902*	0.938*	0.927*	0.975**	1.001**	0.983**	0.230
	(0.350)	(0.389)	(0.457)	(0.481)	(0.484)	(0.480)	(0.478)	(0.481)	(0.483)	(0.899)
Popdens		−0.0001	−0.0005**	−0.0004**	−0.0004**	−0.0004**	−0.0004**	−0.0003**	−0.0003**	−0.001**
		(0.0001)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0004)
HouseSize			6.264***	6.283***	6.433***	6.567***	6.794***	6.825***	6.794***	9.850***
			(1.641)	(1.384)	(1.427)	(1.403)	(1.387)	(1.413)	(1.408)	(2.094)
EmplRate				−0.116***	−0.115***	−0.111***	−0.105***	−0.089***	−0.090***	−0.119***
				(0.015)	(0.016)	(0.016)	(0.016)	(0.020)	(0.020)	(0.022)
Int_rev					10.604***	10.848***	10.520***	10.050***	9.975***	23.149***
					(2.934)	(2.903)	(2.799)	(2.950)	(2.954)	(6.563)
Active_residuals						0.200***	0.195***	0.185***	0.183***	0.287*
						(0.052)	(0.052)	(0.054)	(0.054)	(0.147)
ServExp_TotExp							−1.625	−1.331	−1.308	−2.238
							(1.346)	(1.366)	(1.371)	(1.852)
Rev_Exp								−1.988	−2.340	−0.001
								(1.672)	(2.332)	(0.004)
Autonomy_index									0.250	−0.439
									(1.600)	(1.552)
PersExp_Rev										1.143
										(2.278)
Constant	−5.164***	−5.143***	−8.054***	−3.524***	−3.804***	−4.258***	−4.129***	−4.415***	−4.400***	−5.066***
	(0.161)	(0.162)	(0.813)	(0.759)	(0.784)	(0.749)	(0.777)	(0.778)	(0.783)	(1.746)
Observations	7,039	6,948	6,948	6,948	6,944	6,943	6,943	6,943	6,917	2,373
Log Likelihood	−281.912	−273.046	−266.641	−247.696	−244.509	−242.810	−242.057	−241.048	−240.678	−107.575
Akaike Inf. Crit.	567.824	552.092	541.282	505.392	501.019	499.621	500.114	500.096	501.356	237.149

Note: *p<0.1; **p<0.05; ***p<0.01. Robust standard error

Again, results generally confirm observations with are consistent with the previous model specifications. The measure of civicness retains its significance in explaining the probability of local financial distress for nine out of ten specifications.

2.6   Cluster analysis

In this Section, we further highlight the link between the quality of the social context and the local authorities' balance sheet structure. In the baseline analysis, we used the proxies for civicness individually to investigate the role of the quality of the social context in favouring some budget balance policies and increasing the probability of local governments financial distress. Now, we jointly consider these proxies through a cluster analysis approach to identify homogeneous groups of municipalities - in terms of civicness - and, therefore, evaluate how the balance sheet structure and the probability of facing failure vary across groups. The cluster analysis relies on two of the three proxies for catching civicness used in the baseline analysis: (i) the share of people employed as volunteers in non-profit organizations; (ii) the average voter turnout between referenda held in 2009 and 2016 at the municipal level. The original third proxy - council dismissal due to Mafia infiltration - has been excluded from the cluster analysis because the dummy variable would have been less informative for the analysis purpose. In addition, we consider the ratio between definitively confiscated real estate assets and the total amount of real estate assets (*Assets_index*), at the municipal level, as another proxy for capturing the presence of criminal organizations, and so the quality of the social context[5].

More in detail, we implement a K-means clustering algorithm to divide municipalities into K clusters so that similar municipalities, in terms of civicness, can be grouped. K-means algorithm is one of the most widely used clustering algorithms, making higher similarity between the intra-cluster and lower similarity between the inter-clusters. The K-means clustering is an iterative technique that assigns each point to the cluster whose centroid is the nearest. This is often represented by the average of the cluster. The clustering measures the similarity of the group by iterating the measurement distance between each object and the centre of each cluster using Euclidean distance measuring. To assess the validity of the cluster analysis and find the optimal number of clusters, we rely on the Silhouette method. The silhouette method computes silhouette coefficients of each municipality that measure

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[5]Data on the universe of real estate assets confiscated to Mafia-type organizations are available thanks to an agreement signed by the University of Napoli 'Federico II' and the ANSBC.

how much a municipality is similar to its cluster compared to other clusters. The silhouette value measures how similar an object is to its cluster (cohesion) compared to other clusters (separation). According to this method, we implement a K-means clustering algorithm setting $k = 3$ (see Fig.B.2 in Appendix). The following table shows the final cluster centroids and how each of the three civicness measures contributes to discrimination between the clusters.

TABLE 2.5: K-means clustering method - centroids

Cluster	*Obs.*	*Volunteers*	*Voter turnout*	*Assets_index*
1	1941	10.300450	36.40193	0.03758597
2	4879	9.570820	22.35887	0.04311606
3	34	7.619397	22.46561	4.07861214

Municipalities are classified on the combination of the predetermined selection criterion (proxies for civicness) so that each municipality in a cluster is similar to the others in that cluster and different from municipalities in the other two clusters. In this way, the clusters represent a different level of the quality of the social context. According to the values reported in Table 2.5, we identify the third cluster as the worst in terms of civicness. Municipalities belonging to this group reveal the lowest share of people employed as volunteers in non-profit organizations and of voters turnout in referenda, as well as a massive presence of confiscated real estate assets. Conversely, we identify the first cluster as the group of municipalities characterized by a higher level of civicness.

Then, we describe how local governments' balance sheet structure and the probability of distress vary across groups. We evaluate the differences in the level of indebtedness, active residual and the probability of financial distress.

We also investigate differences in the level of goods publicly provided relying on the share of service expenditure dedicated to the management of waste collection (*Waste_ServExp*) and on the percentage of recycling at the municipal level (*Perc_RD*). Table 2.6 reports the differences in the balance sheet structure across clusters.

TABLE 2.6: Balance sheet structure across clusters

Statistic	Mean $Cluster_1$	Mean $Cluster_2$	Mean $Cluster_3$
Distress	0.011	0.013	0.029
Int_rev	0.011	0.011	0.010
Active_residuals	0.936	0.857	1.277
Waste_ServExp	24.993	23.930	17.636
Perc_RD	0.385	0.397	0.266

Results in Table 2.6 confirm our baseline analysis. Clusters significantly differ in the budget indicators. Local governments' default probability and balance sheet structure worsen as the quality of the social context worsens.

As we claim in the baseline analysis, where voters are poorly civic-minded, compliance with social norms of cooperative behaviour and tax laws is weak. In these contexts, politicians' strategic considerations are favoured, and a widespread tendency of the local authorities not to collect taxes, reducing municipal revenue-generating capacity. Indeed, these municipalities (grouped in $Cluster_3$) reveal the highest level of active residuals, on average. As an extreme consequence, these strategic budgetary policies may increase the probability of financial distress: municipalities belonging to the third cluster are twice as likely to face distress. Clearly, they cannot provide a satisfying level of services to citizens in this financial situation. As Table 2.6 shows, the third cluster reveals the lowest level of expenditure for waste management (compared to the total expenditure for the provision of services) and of the percentage of recycling.

2.7 Concluding remarks

The massive amount of debt accumulated by the Italian municipalities exacerbates the problems related to the management of State debt in case of bailing out. In addition, if the municipalities face financial distress, this inevitably causes damage

to the welfare of the citizens due to the reduction of the bundle of publicly provided goods at the local level.

The huge Italian Public Municipal debt reveals a widespread tendency not to collect taxes. This might be the consequence of the municipal administrative inadequacy; or, it might be intentional, as a way to obtain voters consensus in some specific social contexts. Indeed, where voters are poorly civic-minded, compliance with social norms of cooperative behaviour - as well as compliance with tax laws - is weak. This scenario could favour politicians' strategic considerations and a widespread tendency of the local authorities not to collect taxes, reducing municipal revenue-generating capacity. As an extreme consequence of these strategic budgetary policies, it is possible that many municipalities suffer from financial distress and cannot provide a satisfying level of services to citizens.

We have assumed a different perspective, compared to the literature on local governments financial distress, to understand the roots of this failure. Despite applying monitoring tools enforced by law to prevent the default event, we have investigated whether the quality of the social context (measured by the number of volunteers engaged in non-profit organizations, voter turnout in referenda at the municipal level and council dismissal due to Mafia infiltration) can provoke or accelerate some detrimental financial conditions.

We have shown that local government financial distress is conditioned by other factors in addition to financial management practices. Indeed, many budget indicators, widely used in literature, are not significant in explaining the probability of failure. Our results suggests that scarce civicness might favour politicians' strategic considerations, adversely affecting the probability of financial distress.

Chapter 3

Municipal indebtedness and the reassignment of assets confiscated to Mafia-type organizations

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[1]This chapter is based on a joint paper with Sergio Beraldo and Domenico Suppa

3.1   Introduction

The total public debt of Italian municipalities currently amounts to 38 billion euros (Dipartimento del Tesoro, 2021). In such a situation, municipalities should reduce public spending or increase municipal revenues. Reducing spending implies an unavoidable reduction in the level of goods publicly provided, with consequences on citizens' welfare. However, increasing revenues is not that easy, because of the widespread inefficiencies of the local tax administration and the high propensity not to comply with the tax laws.

A concrete financial recovery strategy might be based on the attempt of exploiting the real estate patrimony available to municipalities. This would allow to increase revenues (i.e. by renting or selling publicly owned real estate) or to contain local public spending. Indeed, surprisingly enough, 40% of the properties used by the Italian public administration are currently rented, with the total spending exceeding one billion and two hundred million euros per year (e.g. Cottarelli, 2014).

Among the opportunities open to municipalities, it is worth mentioning the massive stock of real estate assets confiscated to criminal organizations. This patrimony currently amounts to 17513 assets (ANBSC, 2020) that could be profitably managed by municipalities in order to improve their current financial situation.

The Italian anti-mafia policy allows to seize and confiscate real estate assets and firms owned by organized crime members or affiliates. This policy has proved as a powerful tool for fighting against Mafia-type organizations. Indeed, confiscation of assets managed directly or indirectly by Mafia-type organizations, weakens their economic power. Confiscation may also constitute, however, an instrument to boost economic and social development. Indeed, as confiscated assets are given back to the community, their management might contribute to improve the usually poor social and economic conditions in which organised crime proliferate.

The National Agency for the Administration and Destination of Seized and Confiscated Assets from Organized Crime (hereafter ANBSC) manages the patrimony made up by confiscated assets, assigning the assets to public use. These can be assigned either to government administrations or to local governments; alternatively,

they can be sold under strict conditions. When assigned, municipalities are the primary recipients.

From a public finance perspective, municipalities could reduce rents expenditure using these assets, or they could rent them out so as to generate additional revenues.

This paper focuses on real estate confiscated assets. The aim is to understand whether conditions are given for its profitable management by looking at the factors affecting the time elapsing between confiscation and fruitful re-allocation.

Our analysis is based on a original dataset, whose use was possible thanks to an agreement signed by the University of Napoli 'Federico II' and the ANSBC.

We exploit detailed information on the exact location, timing, re-allocation purposes, type and characteristics of over 4472 confiscated and reallocated assets in Italy. We compute a performance index - based on the time between confiscation and re-allocation - and estimate how the characteristics of the assets, as well as those of the area in which they are located, affect this index. In addition, exploiting information on the municipal socio-economic features, we provide an analysis of the factors that favour the permeability of the territory to Mafia-type activities, relying on the number of confiscated real estate assets per thousand inhabitants as a proxy to capture the intensity of Mafia-type economic interests at the local level.

Results point out that assets located in suburban and rural areas exhibit longer destination times (compared to assets located in urban or industrial/commercial areas). The re-allocation process slows down also for real estate assets used not for residential use or located in more indebted municipalities. In general, local governments exhibit higher reassignment times; the situation further worsens, however, when the local government is a municipality facing severe financial conditions. A higher municipal debt drastically expands the time necessary to reassign the confiscated assets located in the area under the administrative authority of the municipality.

A positive impact is, instead, exerted by the presence of non-profit organizations at the municipal level. This seems plausible in light of the priority given by the Italian Law to the destination for social purposes.

Our analysis highlights that more deprived municipalities - in socio-economic

terms - favour organized crime spread, so these areas reveal higher rates of confiscated assets.

Our research suggests some relevant policy implications. Above all, the cases of reassignment time expansion that emerge from our empirical analysis suggest strengthening and differentiating the channels through which reassignment occurs.

The paper is organized as follows. Section 3.2 describes the institutional background. Section 3.4 discusses our empirical strategy. Section 3.6 presents our findings. Section 3.7 concludes.

3.2 Institutional background

After a series of violent murders and the rise in mafia activities, in September 1982, the Italian Parliament approved the Law 646/82, more commonly known as the *Rognoni-La Torre Law*. This law is a milestone in the fight against organized crime. Indeed, the Law introduces two key measures: the introduction in the Penal Code of article 416, according to which membership to a Mafia-type organization is in itself a crime, independently from the execution of criminal acts; the possibility to confiscate any asset directly or indirectly under the control of Mafia-type organizations. As a consequence, any individual condemned under article 416-bis immediately gets her assets seized.

Given the pervasive presence of mafia-type organizations in Italy, the problem of managing the assets once owned by members of these criminal organizations, soon arose.

However, the reassignment procedure was more precisely regulated only in 1996, when the Law 109/96 was approved.

A consequence of this law was the creation, in 2010, of the ANBSC, a National agency in charge of the whole process, from definitive confiscation to reassignment. The ANBSC was so endowed with decision-making power over the management and reassignment of assets once belonged to Mafia-type organizations.

3.2.1 Anti-Mafia measures: the process of confiscating an asset

The process of confiscating an asset to Mafia-type organisations requires the cooperation of many actors. It is a long and complex process. The first step, done by the head of the National Anti-Mafia Commission, is to investigate the assets of the indicted. The investigation can be extended to all the subjects directly or indirectly related to him. A panel of three judges decides about assets seizure, motivating confiscation and entrusting them to a custodian for the entire duration of the process. Then, the assets go through different statuses until they are finally confiscated and allocated to the State patrimony. As soon as an asset is classified as definitively confiscated, the judiciary phase expires and an administrative phase begins.

From the first degree of confiscation, the ANBSC manages organised crime assets. At the end of the procedure, the Agency can either keep real estate assets for institutional reasons or transfer them to local authorities, which can either keep them for institutional reasons or assign them to third sector organisations under loan-for-use contracts to put them to social use.

The possibility of confiscating assets represents a powerful tool to fight against criminal organizations. Indeed, confiscation is a fundamental instrument to eradicate the pervasive presence of organized crime, especially in areas where it is most rooted (Falcone, Giannone, and Iandolo, 2016). This is also because real estate assets have a strong symbolic meaning for criminal organizations; in a sense, they physically represent the presence of their power on the territory. Not to consider that a large share of criminal financial resources is laundered through the acquisition of real estate properties. Indeed, more than 50% of illegal organised crime profits are reinvested into the legal economy, with real estate as one of the preferred sectors of investment (e.g. Transcrime, 2013).

3.3 Related literature

The economic literature has mainly focused on the effectiveness of confiscation and re-allocation policies targeted to infiltrated firms. Mafia firms exercise market power by economic and non-economic tools. The non-economic tools include corruption of public officials, bribes, and the use of violence, although political corruption is the

main determinant of mafia firms' expansion (Alfano, Cantabene, and Silipo, 2019). The economic dimension includes their capacity to affect access to the market, determine prices and quality of the goods and services they produce, and affect the production conditions of the other firms in the market. In addition, mafia firms may also have a comparative advantage in the capital markets due to the availability of illegal returns to finance investments and their capacity to provide better conditions to access the credit market than the other firms. Empirical evidence was provided concerning how the enforcement of seizure and re-allocation policy drives mafia firms out of the market and decreases the level of market concentration (especially in the construction sector) (Ferrante, Fontana, and Reito, 2021), and also significantly increases rental and sale prices (Calamunci, Ferrante, and Scebba, 2017). Thus, the decline of the mafia firms leads to increased innovation activity and contributes to the creation of a more competitive environment for local entrepreneurship, also concerning competition for public procurement contracts (Slutzky and Zeume, 2018).

However, scholars have not analysed the confiscation and re-allocation of real estate assets that much. A couple of works use data about confiscated real estate assets to construct composite measures of Mafia-type organisations presence in Italian provinces and municipalities (e.g. Calderoni, 2011; Dugato, Calderoni, and Campedelli, 2020). Boeri and co-authors (Boeri, Di Cataldo, and Pietrostefani, 2019), instead, investigate whether the re-allocation produces any external effect on the involved local area by looking at how the monetary value of buildings in the surrounding of confiscated and re-allocated assets responds to the increase in public housing resulting from the application of the Law. Estimates, performed at different geographical units of analysis and relying on micro-level data, unveil a positive relationship between re-allocation cases and the property price of neighbouring buildings. The effectiveness of policies targeted to seizure, confiscations and management of real estate assets was also explored concerning the effect on the degree of electoral results. Building upon the mainstream paradigm developed in the literature, (Ferrante et al., 2021) consider the degree of vote concentration at the municipal level as a proxy of mafia presence and provide empirical evidence that the seizure and re-allocation of real estate assets significantly reduce electoral concentration (focusing

on Sicilian municipalities). Our research contributes to this field of literature, assuming a different perspective. We investigate whether real estate assets confiscated to criminal organisations represent adequate resources for local authorities. In light of municipalities' critical debt situation, we try to understand whether they could obtain public finance benefits from using these assets, especially if the beneficiary institution is a municipality in severe financial difficulty.

3.4 Exploratory analysis

In this section, we carry out some exploratory analysis. Regression analysis will follow.

Our purpose is twofold. In particular, the goal is to understand: i) which factors increase the amount of time (i.e. number of days) necessary to reassign the real estate assets confiscated to Mafia-type organizations, i.e. what are the characteristics of the asset as well as those of the recipient that affect the length of the reassignment procedure. To this end, we build a performance index - based on the computation of time between confiscation and reassignment, for any of the 4472 assets in our sample; ii) whether more socially and economically deprived municipalities are those more prone to Mafia-type activities: we rely on the number of confiscated real estate assets per thousand inhabitants as an index of municipal permeability to organised crime interests.

3.4.1 Data

Our analysis relies on a novel dataset, which merges information from different sources. Data on confiscated and re-allocated real estate assets over the period 1984-2018 are provided by the ANBSC. The whole dataset comprises 17309 observations.

However, for most of the observations the necessary information concerning the date of confiscation, the date of reassignment, and other assets characteristics, are unfortunately missing. From this broader dataset, we have therefore extracted a subsample of observations for which the just mentioned information is present, omitting to consider those for which information about the current judiciary and administrative status is not available. Overall, we draw on a rich dataset describing many

relevant features of 4472 real estate assets. This dataset includes detailed information about the date of definitive confiscation and reassignment, assets characteristics, their location, the purposes driving reassignment.

We elaborate on some of these information and introduce the following variables:

- *Area*: a dummy variable which takes value 1 if the asset is placed in a suburban or rural area, 0 otherwise;

- *Recipient*: a dummy variable which takes value 1 if the recipient is a local administrative entity (such as a region, a province or a municipality), 0 otherwise;

- *Category*: a dummy variable which takes value 1 if the confiscated asset is a real estate, 0 if it is a land. Later, to sharpen our results a little bit, we also consider assets main sub-categories and introduce specific dummy variables;

- *Assets_index*: the ratio between definitively confiscated real estate assets and the total amount of real estate assets, at the municipal level.

By exploiting the 2011 Census data provided by the Italian National Institute of Statistics (ISTAT), we integrate the analysis with a set of demographic and socio-economic variables characterizing the municipalities where assets are located: (i) *EduRate*, the share of citizens that did not complete compulsory education; (ii) *EmplRate*, the employment rate; (iii) *DemoSize*, a dummy variable which takes value 1 if the municipality has more than one hundred thousand inhabitants; (iv) *Nonprofit*, the total number of non-profit organizations at the municipal level. To take into account the financial condition of the municipalities involved in the re-allocation procedure, we rely on data about the incidence of interest expenditure over total municipal expenditure (*Debt_Index*). Data are published by the Ministry of Domestic Affairs and are available on the Bureau Van Dijk platform (AIDA PA).

Table C.1 in Appendix details all the variables used in the analysis.

3.4.2   Exploratory analysis: the pool of confiscated assets in Italy

This Section provides an exploratory analysis of the data. First, we examine the geographic distribution both of the universe of confiscated and re-allocated assets (17309 real estate assets) and of the subsample employed in the regression analysis.

The latter counts 4472 confiscated and reassigned real estate assets, located in 398 different Italian municipalities.

We map the distribution of these assets across the Italian provinces. Figures 3.1(a) and 3.1(b), in general, do not show great differences.

Sicily, Calabria, Campania and Puglia reveal a massive presence of confiscated assets, which is of no surprise given the well-known presence of organised crime in these regions. Real estate assets are mainly concentrated in some densely populated metropolitan areas, i.e. Napoli, Palermo and Reggio Calabria, and in their neighbourhood.

Northern and Central Italian regions also exhibit a remarkable concentration of assets in some areas. As far as data from the restricted sample are concerned, Lombardia has 247 confiscated and reassigned real estate assets, 50% of whom are located in Milan. Smaller clusters are also present in Liguria, Veneto and Emilia-Romagna.

FIGURE 3.1: Geographic distribution of re-allocated real estate assets
- by province

(a) universe of assets   (b) restricted sample
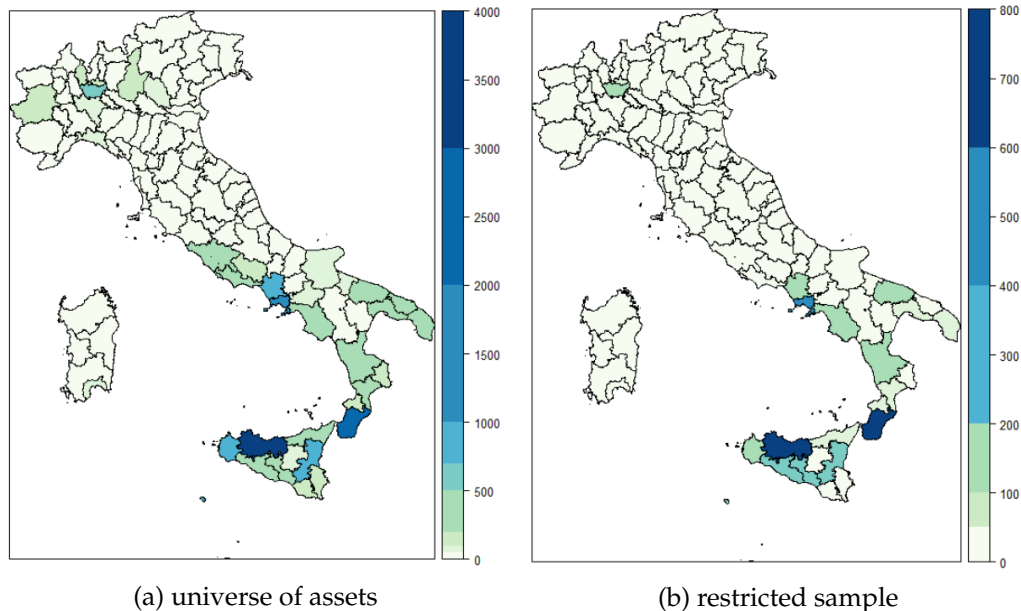
Source: our elaboration on data provided by ANSBC.

More in detail, Table 3.1 reports the top five Italian regions and provinces in terms of confiscated and re-allocated real estate assets. A worrying presence of assets is visible in Sicily, Calabria, Campania and Puglia, which is no surprise given the

well-known presence of organised crime in these regions.

The presence of Lombardia is remarkable. Such presence witnesses the well-known shift of economic interests from the areas of origin of Mafia-type activities to areas in which economic opportunities are higher.

TABLE 3.1: Top five regions and provinces

Regions	*N. assets*	*% assets*	*Provinces*	*N. assets*	*% assets*
Sicilia	6908	39.91%	Palermo	3770	21.78%
Calabria	2908	16.80%	Reggio Calabria	2096	12.11%
Campania	2747	15.87%	Napoli	1570	9.07%
Puglia	1535	8.87%	Catania	799	4.62%
Lombardia	1242	7.17%	Caserta	717	4.14%

Source: our elaboration on data provided by ANSBC.

Similar considerations emerges from Table 3.2. We report the top five Italian regions and provinces in terms of confiscated real estate assets, focusing on restricted sample employed later for regression analysis. Again, assets are more densely clustered in Sicily, Calabria, Campania and Puglia.

TABLE 3.2: Top five regions and provinces - restricted sample

Regions	*N. assets*	*% assets*	*Provinces*	*N. assets*	*% assets*
Sicilia	1740	39%	Reggio Calabria	862	19%
Calabria	1062	24%	Palermo	798	18%
Campania	863	19%	Napoli	626	14%
Puglia	302	7%	Caltanissetta	346	8%
Lombardia	247	5%	Catania	267	6%

Source: our elaboration on data provided by ANSBC.

The Table also confirms a concentration of assets in metropolitan areas, in particular in Palermo and Reggio Calabria.

Available data allow to examine the number of reassignments over time. These have increased in the aftermath of the approval of the 1996 Law, which regulated more clearly the related procedures. Most reassignments have occurred in the last

few years, however. As Table C.2 in the Appendix reports, a substantial amount of real estate assets was reassigned in the period 2015-2018.

The Law lists a set of different uses for the re-allocated assets. The two broader categories are: *institutional, justice and public order* and *social* uses. The former category includes, for example, the possibility to use the goods to set up tribunals, police stations, council houses. The latter includes the possibility to grant the goods to non-profit associations (disable centres, sport centres and the like). Figures 3.2(a) and 3.2(b) show how re-allocation purposes are distributed within, respectively, the universe and the restricted sample employed later for regression analysis.

FIGURE 3.2: Re-allocation type
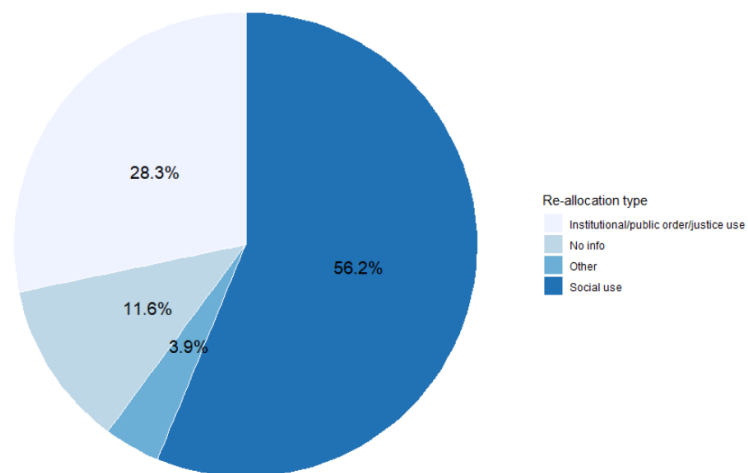
(a) universe of assets
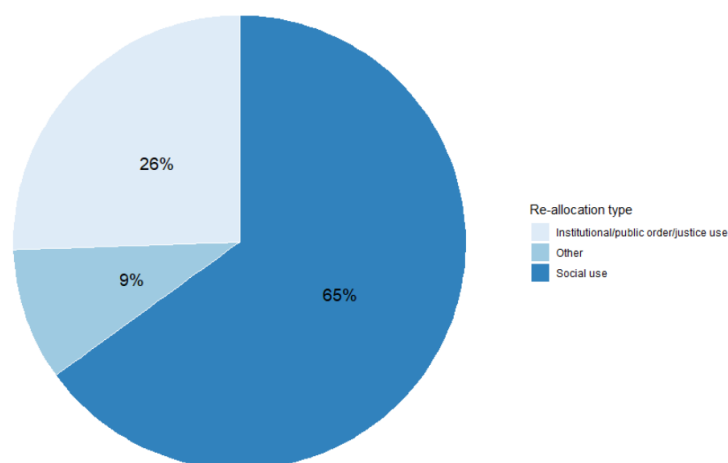
(b) restricted sample

Source: our elaboration on data provided by ANSBC.

The aim pursued by the Italian Parliament when it approved the relevant legislation, was to use all the confiscated assets to re-establish the rule of law, so restoring the quality of the social context where the control of Mafia-type organizations is most entrenched: assets re-allocated for social use may provide concrete alternatives for individuals potentially attracted by organized crime; in addition, they could also contribute to regenerate public finance of local areas plagued by Mafia-type organizations.

The implementation of Law 109/96 and the establishment of the ANBSC have contributed to progressively increase the number of reassigned assets. Nevertheless, the length of the reassignment procedure sensibly varies across areas. To length of time taken for reassignment is a particularly important indicator, for, as time goes by, the economic value of the assets shrinks. This is certainly due to the natural decay of the economic value of any real estate asset when appropriate investments are not done. This is also due, however, to the fact that, as the time goes on, the probability that assets come under the illicit control of subjects or organization increase; as increases the probability that assets are damaged by mafia-type organizations for retaliation. For all these reasons, shortening the time between confiscation and reassignment is crucial, if one wishes to preserve the economic value of the confiscated assets. This is why in what follows we will examine a *performance index*, computed as follows. For each confiscated real estate asset, we calculate the number of days between confiscation and reassignment. The performance index at the municipal level is simply the median number of days required to reassign an asset in a given municipality. We use the median and not the mean, to avoid overweight for extreme values.

Once equipped with the performance index, it is possible to examine, for example, how the length of time required for reassignment varies with the municipal size.

By exploiting the information about demographic ranges made available by the Ministry of Domestic Affairs (see Tab. C.3 in Appendix), we divide municipalities into twelve groups and plot the performance index distribution across them (Fig. 3.3).

FIGURE 3.3: Performance_index distribution
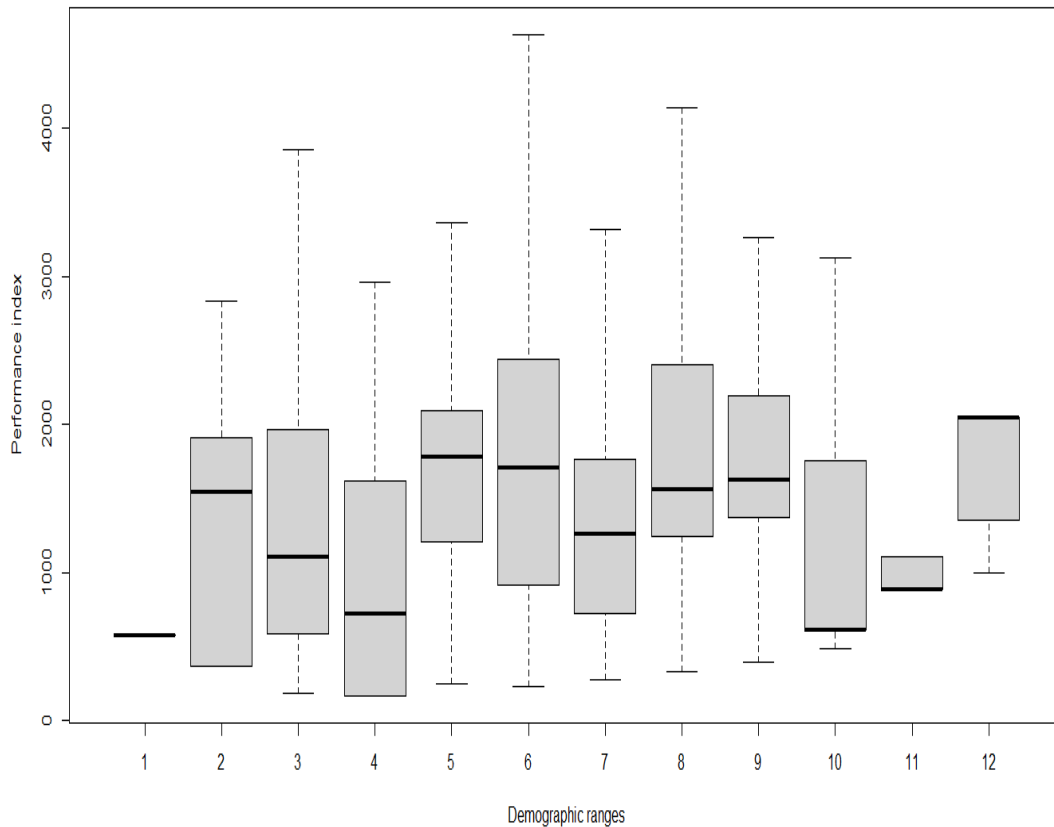
What we observe is a highly asymmetrical distribution of the performance index, which becomes more evident going towards medium-large municipalities (between 3000 and 100000 inhabitants - demographic ranges 5-9): as the size of the resident population increases, the length of time required for reassignment becomes generally longer. This evidence is exacerbated in the case of municipalities with over five hundred thousand inhabitants. The last box-plot shows an almost truncated distribution on the extreme value. Indeed, 50% of the distribution in this sub-sample of municipalities is squeezed to the extreme value: Palermo belongs to this demographic range, revealing the highest number of real estate assets and the highest re-allocation time. This implies that much of the performance index distribution is squeezed on the box-plot median. In general, the number of days between confiscation and re-assignment varies with the municipal size. It goes from 167 days to an extreme case of 22 years.

3.5 Regression analysis

In what follows we first focus on factors conditioning the time required between confiscation and reassignment, by looking at the features of the assets and those of the areas in which assets are located. We then examine the characteristics of the municipalities with more intense organised crime activities, where intensity is captured by a greater presence of confiscated assets.

As explanatory, we use variables derived from data recorded at the 2011 ISTAT Census or provided by ANBSC, as described in Section 3.4.1. The generic form of the estimated linear multiple regression model can be expressed as follows:

$$Y_i = \beta_0 + \beta_1 X_i + \epsilon_i \tag{3.1}$$

where Y_i is either equal to:

$$Y_i = \begin{cases} \text{Performance index} \\ \text{Permeability index} \end{cases}$$

and X_i is a matrix that contains information about real estate assets, demographic and socio-economic characteristics of the municipalities where assets are located.

First, we investigate factors that affect reassignment. The outcome variable is what we have termed as *performance index*, i.e. the median number of days for reassignment in a particular municipality.

Second, we inspect the characteristics of the municipalities more plagued by Mafia-type infiltrations. The dependent variable is, in this case, what we call the permeability index, i.e. the number of definitively confiscated real estate assets per thousand inhabitants. Here, the *X* matrix of equation 3.1 contains municipal socio-economic variables.

We also consider two different proxies for catching the quality of the social context, widely accepted by the economic literature: the percentage of citizens engaged as volunteers in non-profit organizations (e.g. Putnam, Leonardi, and Nanetti, 1994); council dismissal due to Mafia-infiltration (e.g. Beraldo et al., 2017).

All the variables used are described in detail in Appendix. Results are discussed in the next Section.

3.6 Results

3.6.1 Factors conditioning reassignment

We begin by analysing how the time between confiscation and reassignment is affected by asset characteristics and by the nature of the recipient. Table 3.3 reports the results.

TABLE 3.3: Effects of asset characteristics and nature of the recipient on reassignment

	Dependent variable:			
	Performance_index			
	(1)	(2)	(3)	(4)
Area	425.714***	415.881***	349.798***	293.146***
	(37.528)	(37.482)	(41.224)	(41.220)
Recipient		143.929***	115.721***	174.163***
		(39.167)	(38.906)	(39.441)
Category			−218.335***	−272.148***
			(45.459)	(45.395)
Assets_index				−174.853***
				(8.921)
Constant	1506.444***	1394.657***	1587.388***	1686.193***
	(23.344)	(34.486)	(52.885)	(53.173)
Observations	4472	4472	4472	4472
R^2	0.025	0.027	0.033	0.049
Adjusted R^2	0.025	0.027	0.032	0.049
Residual Std. Error	1304.712 (df = 4470)	1303.672 (df = 4469)	1299.922 (df = 4468)	1288.976 (df = 4467)
F Statistic	116.799*** (df = 1; 4470)	62.562*** (df = 2; 4469)	50.890*** (df = 3; 4468)	58.119*** (df = 4; 4467)

Note: *p<0.1; **p<0.05; ***p<0.01

Results suggest that, on average, the re-allocation timing of confiscated real estate assets is around 4 and a half years. For this basic time (captured by the coefficient of the constant term), the explanatory variables positively or negatively impact the number of days between definitive confiscation and re-allocation (column (4) Tab. 3.3). More in detail, real estate assets located in suburban and rural areas record longer times to destination, compared to assets located either in town or in industrial/commercial areas: a real estate asset located in a rural area, ceteris paribus, takes 10 months longer to be re-allocated than an asset in a central area. Assets category also entails differences in the timing of the destination. Indeed, real estate units for residential use are reassigned more quickly than other types of real estate (for example, land), roughly 8 to 9 months less.

The type of recipient also significantly impacts the performance index. Local governments (region, province or municipality) exhibit a higher reassignment time - about six months, on average - than the other recipient types.

An interesting consideration concerns the positive effect of the *Assets_index* in reducing the time necessary for reassignment. The massive presence of confiscated real estate assets in the municipality (compared to the total amount of municipal real estate units) reduces time. For each percentage point more of the presence of confiscated assets than the total of real estate units within the municipal area, the re-allocation timing is reduced by about 6 months. This result, apparently counter-intuitive, can be explained as the effect of a greater administrative capacity: local authorities facing a massive presence of confiscated assets acquire experience of the reassignment process. However, as emerged during many informal talks the authors had with members of the ANBSC, this result may also capture the great willingness to cooperate that public authorities display in areas in which the presence of Mafia-type organization is intense. Something presumably driven also by the will to get rid of any suspicion of being mild with criminal organizations.

To sharpen our results a little bit, we also gather assets by sub-categories:

- *Rural_category*: land, land with rural building, ex-rural building and similar;

- *Luxury_category*: single-family detached house and villa;

- *Residential_category*: apartment building, garage, units for residential and collective use, and similar;

- *Business_category*: shop, warehouse, industrial building and similar.

Table 3.4 shows the results.

TABLE 3.4: Effects of assets category on re-allocation timing

		Dependent variable:		
		Performance_index		
	(1)	(2)	(3)	(4)
Area	293.990***	298.808***	304.295***	294.807***
	(41.283)	(41.516)	(41.905)	(41.161)
Recipient	174.585***	176.598***	187.963***	184.877***
	(39.456)	(39.561)	(40.327)	(40.052)
Assets_index	−174.458***	−176.251***	−171.920***	−172.801***
	(8.888)	(8.833)	(8.962)	(9.026)
Rural_category	266.650***	242.394***	33.764	−376.608**
	(45.225)	(46.574)	(85.321)	(148.319)
Luxury_category		−151.425**	−356.164***	−769.355***
		(68.289)	(95.932)	(153.657)
Residential_category			−274.489***	−688.390***
			(74.135)	(140.671)
Business_category				−691.853***
				(151.932)
Constant	1413.716***	1433.629***	1625.475***	2046.315***
	(35.005)	(34.955)	(61.820)	(129.264)
Observations	4472	4472	4472	4472
R^2	0.049	0.050	0.054	0.063
Adjusted R^2	0.048	0.049	0.053	0.061
Residual Std. Error	1289.199 (df = 4467)	1288.661 (df = 4466)	1285.994 (df = 4465)	1280.337 (df = 4464)
F Statistic	57.713*** (df = 4; 4467)	47.155*** (df = 5; 4466)	42.716*** (df = 6; 4465)	42.730*** (df = 7; 4464)

Note: *p<0.1; **p<0.05; ***p<0.01

Real estate assets for residential use (*Luxury_category*, *Residential_category*) have much appeal compared to land - with or without rural building - and similar assets. Indeed, single-family detached house, apartment building, garage and similar reduce the average re-allocation timing by two years, compared to *Rural_category* which reduces it by one year. Shop, warehouse, industrial building and similar (*Business_category*) too are quickly destined. This evidence suggests that the real-location process should be differentiated according to asset-type. In particular, the evidence suggests that it might be better to promptly get rid of some assets by selling them, rather than seeing them deteriorating over time, what also reduces the probability of future reassignment. This would allow to either obtain or save resources that might be used to enhance the assets that remain available to the State.

Resources availability is indeed important to prevent deterioration of assets and to facilitate reallocation. To stress this point, we consider how the financial condition at the municipal level affect the performance index. Indeed, we take into account municipal indebtedness by relying on data about the incidence of interest expenditure over total municipal expenditure (*Debt_Index*). By the priority that the Italian Parliament gives to the reuse of confiscated properties for social purposes, we also consider the effect of the presence, at the municipal level, of non-profit organizations on the index. Results are reported in the following table.

TABLE 3.5: Effects of municipal characteristics on re-allocation timing

	Dependent variable:	
	Performance_index	
	(1)	(2)
Area	296.871***	309.811***
	(41.290)	(42.413)
Recipient	147.515***	132.726***
	(38.940)	(38.839)
Category	−270.034***	−246.080***
	(45.783)	(47.753)
Assets_index	−181.343***	−179.397***
	(9.204)	(9.430)
Debt_index	4885.510***	4645.862***
	(931.545)	(927.525)
Nonprofit		−0.045***
		(0.009)
Constant	1669.190***	1684.909***
	(54.755)	(54.273)
Observations	4427	4414
R^2	0.054	0.054
Adjusted R^2	0.052	0.053
Residual Std. Error	1286.300 (df = 4421)	1287.042 (df = 4407)
F Statistic	50.029*** (df = 5; 4421)	41.866*** (df = 6; 4407)

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Results in Table 3.5 point out that municipal indebtedness drastically expands re-allocation timing. All the characteristics of real estate assets considered in the previous regressions preserve their role in explaining the performance index. Reasonably, local authorities facing severe financial conditions are not able to preserve the value of - and reallocate - the real estate assets located in their territory. The

lack of necessary resources - or in general the inefficiency of the administrative organization - extends the time between definitive confiscation and re-allocation of 12 years. Quite paradoxically, local authorities in severe financial conditions are those that might benefit most from the recovery and use of confiscated assets. Indeed, as highlighted above, municipalities could reduce rents expenditure using these assets or rent them out to generate additional revenues. High municipal debt, hence lack of adequate resources, presumably prevent them to enjoy this opportunity.

Simultaneously, a positive impact is exerted by the presence of non-profit organizations in the municipal area. This result seems plausible, in light of the priority given to the destination for social purposes. To clarify the magnitude of this effect, we collect municipal data about various types of non-profit organizations and, in what follows, we investigate whether a differential impact is related with different legal statuses of non-profit organizations.

Non-profit organizations and reassignment

Italian legislation allows non-profit organizations to take on different legal statuses. Depending on the legal status, the role assigned to volunteers and the labour-capital ratio change. Such variations partially reflects the goals that organizations pursue.

Among the legal forms acknowledged by the Italian legal system, we focus on: Foundations, Associations and Cooperative firms. Associations, in particular, may acquire a special legal status through a recognition process. In this case they can broad their aims and scope.

We conjecture that the density of different types of non-profit organizations may have an effect on the performance index. So, we replace the total municipal number of non-profit organizations, $Nonprof$, in the specified model in eq.3.1 with the share of non-profit organizations selected on their legal status. We estimate this effect taking into account municipal size (*DemoSize*), in terms of resident population. Table C.4 in Appendix displays the results.

Regression results confirm the positive impact of non-profit organizations on reducing the performance index, although it is a limited effect: a reduction in re-allocation timing that not exceeds two weeks (see column (7) in Tab.C.4). More in

detail, we find that the presence of Foundations, recognized Associations and Social Cooperatives within municipalities significantly reduces re-allocation timing. Conversely, we find evidence of an adverse effect of the presence of non-recognized associations.

Results appear as plausible if one considers differences in the structural set-up, in the level of volunteers and workers engaged, in the availability of financial resources. Although Foundations are non-profit entities with legal personality, just as a recognized Association are, the former generally manage a relevant amount of resources, a key circumstance in asset acquisition and management.

3.6.2 Municipal permeability to organized crime

Having shown evidence about the main factors affecting performance, we further examine municipal characteristics favouring organized crime diffusion. The dependent variable is a permeability index, computed as confiscated real estate assets per thousand inhabitants. We rely on this index to measure the level of municipal permeability to the economic interests of Mafia-type organizations.

To better explore this points, we perform our estimates including two different proxies for the quality of the social context among explanatory variables. We consider situations in which the distribution of citizens' intrinsic motivations and compliance with social norms is highly unfavourable. To identify such situations, we take advantage of the Italian Law 221/1991, which allows the Central Government to dismiss the municipal council when there are reasons to believe that Mafia-type organizations can influence or control council members, with practical effects either on the functioning of the council itself or on the nature of the decisions it takes. We introduce a dummy variable in our dataset, *Dismissal*, which takes value one for municipalities that have faced at least one council dismissal. As emphasized in many reports of the national Anti-Mafia Commission, municipal council dismissal does not represent an efficacious way to stop the influence of criminal organizations (e.g. Ministero dell'Interno, 2014). This is because their influence at the municipal level is fed by social norms, which allow broad support to (closed) Mafia-type elites. In deprived social contexts, especially in terms of civicness, council dismissals cannot permanently break ties between criminal organizations and local officials. This

is also witnessed because many municipal councils have been dismissed more than once in the last thirty years.

We rely also on another variable to proxy for the quality of the social context, more directly catching civicness: the share of people volunteering in non-profit organizations at the municipal level (e.g. Putnam, Leonardi, and Nanetti, 1994; Bürker and Minerva, 2015).

Results are reported in the following Table.

TABLE 3.6: Municipal characteristics effect on permeability index

	Dependent variable:		
	Permeability_index		
	(1)	(2)	(3)
Dismissal	0.813***	0.328*	0.414**
	(0.156)	(0.198)	(0.187)
EduRate		0.772***	0.820***
		(0.101)	(0.112)
EmplRate			0.026**
			(0.012)
Constant	2.433***	0.988***	−0.108
	(0.104)	(0.163)	(0.605)
Observations	4472	4472	4472
R^2	0.006	0.036	0.037
Adjusted R^2	0.006	0.036	0.036
Residual Std. Error	5.189 (df = 4470)	5.109 (df = 4469)	5.108 (df = 4468)
F Statistic	27.091*** (df = 1; 4470)	84.487*** (df = 2; 4469)	57.409*** (df = 3; 4468)

Note: $^{*}p<0.1; ^{**}p<0.05; ^{***}p<0.01$

They suggest that more deprived municipalities, characterized by a lower level of education and scarcer civicness, represent fertile ground for the diffusion of mafia-type organizations. Ceteris paribus, where the employment rate is higher - what indicates a more intense economic activity - criminal activity is more intense. As

expected, municipalities where council dismissals occurred, display an high permeability to Mafia-type interests, as measured by the presence of confiscated assets.

Similar considerations apply when we exploit the share of volunteers employed in non-profit organizations to capture the level of civicness.

TABLE 3.7: Municipal characteristics effect on permeability index

	Dependent variable:		
	Permeability_index		
	(1)	(2)	(3)
Volunteers	−0.452***	−0.396***	−0.491***
	(0.031)	(0.038)	(0.039)
EduRate		0.395***	0.553***
		(0.083)	(0.090)
EmplRate			0.099***
			(0.012)
Constant	4.486***	3.422***	−0.137
	(0.181)	(0.340)	(0.600)
Observations	4459	4459	4459
R^2	0.056	0.065	0.075
Adjusted R^2	0.056	0.065	0.075
Residual Std. Error	4.690 (df = 4457)	4.668 (df = 4456)	4.643 (df = 4455)
F Statistic	266.244*** (df = 1; 4457)	155.739*** (df = 2; 4456)	121.062*** (df = 3; 4455)

Note:	*p<0.1; **p<0.05; ***p<0.01

Results in Table 3.7 are coherent with the previous ones. A widespread voluntary activity in the municipal area signals, ceteris paribus, a better quality of the social context and, therefore, a territory less prone to accommodate Mafia-type interests. All the other explanatory variables preserve their effect on the permeability index.

Overall, our findings confirm that lower education and scarce compliance with social norms are the grounds in which Mafia is rooted.

3.7 Concluding remarks

To tackle organised crime, the Italian law allows to confiscate and reassign real estate properties under the control of Mafia-type organizations. Such policy represents a crucial tool to undermine the power of criminal organisations. Indeed, the reassignment procedure might contribute to the social and economic development of the areas in which confiscations were brought about.

In this paper, we have investigate whether assets confiscated to criminal organisations represent effective resources for local authorities. Municipalities are the leading local authorities to which the Italian authorities turns to reassign confiscated real estate assets.

In light of Italian municipalities' critical debt situation, they could obtain public finance benefits from using these assets, especially if the beneficiary institution is a municipality in severe financial difficulty. Unfortunately, resources availability is indeed important to prevent deterioration of assets and to facilitate reallocation. Resources are scarce in highly indebted municipalities.

The considerations that emerged from our analysis have relevant practical implications. Our estimates suggest that assets located in suburban and rural areas exhibit longer reassignment time (compared to assets located in central or industrial/commercial urban areas). Accordingly, residential real estate units are re-allocated more quickly. Since reassignment varies with the type of assets, it could be useful to group similar assets by type to differentiate the channels through which the reallocation takes place. The most valuable assets could be reassigned through the procedures currently in force. For the placement of goods in a poor state of conservation, special procedures could be established, which should also contemplate their quick sale on the market.

Moreover, interesting considerations also concern the significant effect of the type of recipient on the performance index. Local governments (region, province and municipality) exhibit higher reassignment time. This situation sharply worsens when local authorities face severe financial conditions. A higher municipal indebtedness drastically expands re-allocation timing. A high debt implies the lack of adequate resources and skills to manage the procedures for acquiring confiscated real

estate assets, with negative consequences on re-allocation timing. At the same time, these results lead us to argue that local authorities in severe financial conditions are the ones that could benefit most from the use of the real estate assets at issues.

A good idea might be to implement a national Investment Plan endowing the municipalities with the necessary resources to enhance the assets located in their territory. This would allow to stop deterioration and favour a fruitful reallocation of the confiscated assets.

Appendix A

Appendix for Chapter 1

TABLE A.1: Variables' description

Name	Variable description	Source	N	Mean	St. Dev.	Min	Median	Max
Outcome variables								
Active residuals	ratio between active residuals and municipal revenues	AIDA PA	7036	0.90	0.59	0.12	0.73	9.95
Debt_index	net debt interest expenditure over total expenditure	AIDA PA	7036	0.01	0.02	0	0.01	1
Int_Rev	net debt interest expenditure over total current revenues	AIDA PA	7036	0.01	0.02	0	0.01	1
Recycling	level of municipal recycling	ISPRA	7036	0.43	NA	0.00	0.47	0.96
Explanatory variables								
Altitude	height above sea level	ISTAT	7036	337.57	279.75	0	279	2035
Mount	mountainous character	ISTAT	7036	0.91	0.95	0	0	2
HouseSize	percentage of family with more than three members	ASC	7036	0.46	0.10	0.05	0.47	0.82
Popdens	ratio between resident population and municipal surface	ASC	7036	287.79	630.24	1.17	108.48	13092.81
EmplRate	employment rate	ASC	7036	42.91	8.75	14.88	44.20	93.74
EduRate	no compulsory education rate	ISTAT	7036	10.73	4.03	0.00	10.15	43.75
Firmdens	firm density	ASC	7036	0.06	0.02	0.01	0.06	0.25
Income_pc	income per capita	MEF	7036	8438.12	2598.10	2720	8707.3	20636
TotalExp_pc	total municipal expenditure per capita	AIDA PA	7036	581.09	394.08	0.00	500.80	21367.56
Proxy for civicness								
Dissflag	dummy for council dismissal due to mafia infiltration	Anti-Mafia Commission	7036	0.02	0.14	0	0.00	1
Volunteers	percentage of inhabitants engaged in non-profit organizations	ASC	7036	9.72	9.33	0.05	7.90	342.47
VotTurn_09	percentage of voter turnout in referenda held in 2009	Ministry of Domestic Affairs	7036	0.21644	0.1187316	0.01639	0.17420	0.81913
VotTurn_16	percentage of voter turnout in referenda held in 2016	Ministry of Domestic Affairs	7036	30.629	7.112276	7.091	30.266	74.046

FIGURE A.1: Correlation plot

TABLE A.2: GenMatch baseline results - balance statistics

Balance statistics	Before matching	After matching
Income per capita		
Uncivic group	5295	5295
Civic group	8693.8	5353.5
Std mean diff	-208.75	-35.902
Var(Uncivic)/ Var(Civic)	0.4229	1.0962
T-test p-value	0.0000	0.5172
KS Bootstrap p-value	0.0000	0.418
KS Naive p-value	0.0000	0.4478
KS Statistic	0.6748	0.1061
Total expenditure per capita		
Uncivic group	457.72	457.72
Civic group	599.33	466.78
Std mean diff	-69.066	-44.179
Var(Uncivic)/ Var(Civic)	0.2494	12.945
T-test p-value	0.0000	0.3582
KS Bootstrap p-value	0.0000	0.495
KS Naive p-value	0.0000	0.5439
KS Statistic	0.3312	0.0985

FIGURE A.2: Difference in active residuals between uncivic munici-
palities and the remaining ones
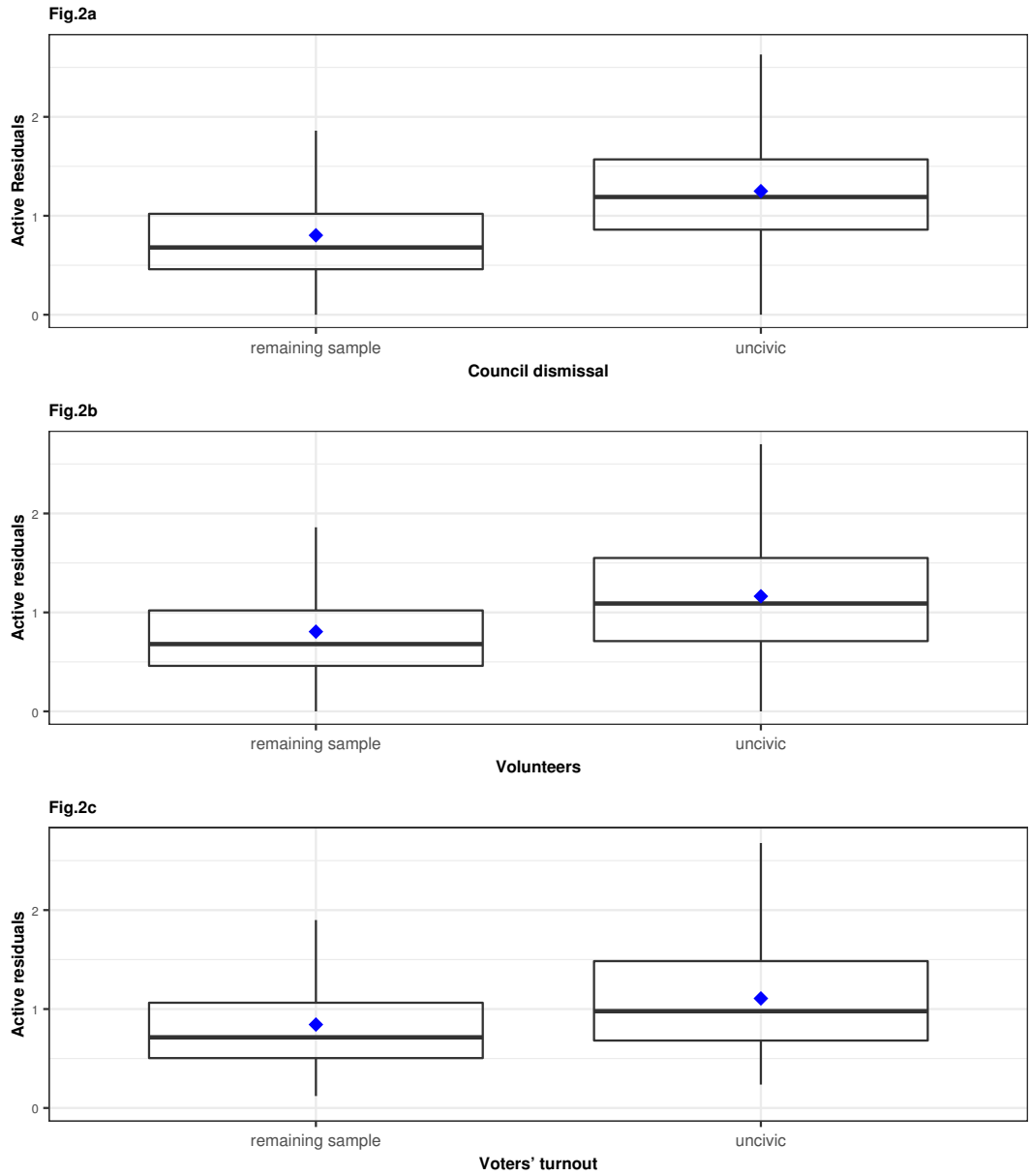
Fig.2a

Fig.2b

Fig.2c

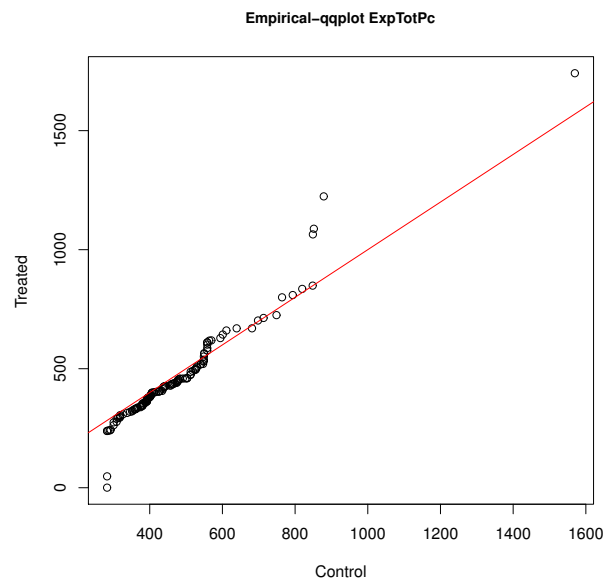FIGURE A.3: Empirical QQ-plot - Per capita public expenditure

FIGURE A.4: Empirical QQ-plot - Per capita income
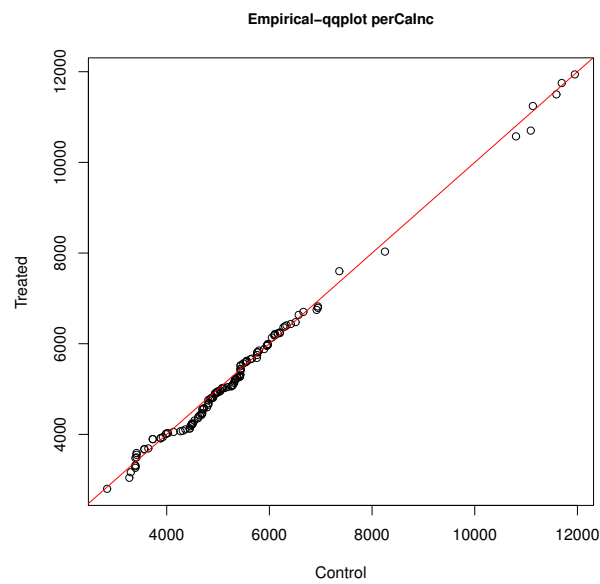
TABLE A.3: Differences in quality of the publicly provided goods - recycling

Dependent variable	Outcome differences	p-value	Uncivic obs.	Civic obs.
Level of recycling	-0.0976	0.0001	132	132

TABLE A.4: Differences in active residuals (without removing spillover effects)

Dependent variable	Outcome differences	p-value	Uncivic obs.	Civic obs.
Active residuals	0.3185	0.0072	132	132

TABLE A.5: Catching civicness - thresholds

Threshold proxy for civicness	Outcome differences	p-value	Uncivic obs.
Volunteers			
< 10%	0.0331	0.2776	3060
< 9%	0.0353	0.2703	2770
< 8%	0.0566	0.0307	2440
< 7%	0.0391	0.0133	2111
< 6%	0.0873	0.0019	1760
< 5%	0.0518	0.1638	1369
< 4%	0.0888	0.0166	987
< 3%	0.1384	0.0042	617
< 2%	0.2126	0.0003	302
< 1%	0.2629	0.0070	108
Voters turnout in referenda held in 2009			
< 20%	0.1133	0.0002	3735
< 18%	0.1318	0.0000	3147
< 16%	0.1684	0.0000	2296
< 14%	0.2431	0.0000	1405
< 12%	0.2446	0.0000	773
< 10%	0.3020	0.0000	347
< 9%	0.3497	0.0000	215
< 8%	0.4289	0.0023	115
Voters turnout in referenda held in 2016			
< 20%	0.2583	0.0471	267
< 18%	0.4125	0.0013	136
< 16%	0.5377	0.0041	68

Appendix A2

As a matter of notation, in what follows we will use the symbol $\succeq$ to indicate that a given policy is at least as good as another for some set of voters, with $\succ$ and $\sim$ indicating strict preference and preferential indifference respectively.

Proof of Proposition 1

Proof. Given $\tilde{F}(S) < F^T(S)$, suppose that in equilibrium $q_M^* = q_A^* > 0$. As both π_M^* and π_A^* are budget balanced under the distribution of S respectively presumed by Party M and A, i.e. $\tilde{F}(S)$ and $F^T(S)$, it must be $m_M^* < m_A^*$, i.e. $\sigma_M^* < \sigma_A^*$, from which the thresholds for tax compliance under the two policies are derived, $s^*(\sigma_A) < s^*(\sigma_M)$.

Consider first any i such that $s^*(\sigma_A) < s^*(\sigma_M) < s_i$. Any such *i* fulfils her tax duties under both policies. As by hypothesis $q_M^* = q_A^*$, any such *i* abstains, for she is indifferent between π_M^* and π_A^*, or $\tilde{u}_i(\pi_M^*) = \tilde{u}_i(\pi_A^*) = Y - T + \phi(q_M^* = q_A^*)$.

Consider now any *i* such that $s^*(\sigma_A) < s_i < s^*(\sigma_M)$. She will vote for the M party, whenever $E[u|\pi_M^*, s_i] > \tilde{u}_A^*$, or

$$(1 - \sigma_M^*)[y + \phi(q_M^*)] + \sigma_M^*[y - T(1 + \theta) + \phi(q_M^*) - s_i] > y - T + \phi(q_A^*)$$

which implies

$$s_i < \underbrace{\frac{T}{\sigma_M^*} - T(1 + \theta) - \frac{\phi(q_A^*) - \phi(q_M^*)}{\sigma_M^*}}_{\gamma} \tag{A.1}$$

With $q_M^* = q_A^*$ the latter inequality reduces to $s_i < \frac{T}{\sigma_M^*} - T(1 + \theta) \equiv s^*(\sigma_M)$, obviously verified for any $s^*(\sigma_A) < s_i < s^*(\sigma_M)$.

Finally consider any *i* such that $s_i < s^*(\sigma_A) < s^*(\sigma_M)$. Any such *i* takes the risk of cheating upon her tax bill whatever the policy in place. Any *i* such that $E[u|\pi_M^*, s_i] > E[u|\pi_A^*, s_i]$, or

$$(1 - \sigma_M^*)[y + \phi(q_M^*)] + \sigma_M^*[y - T(1 + \theta) + \phi(q_M^*) - s_i]$$
$$> (1 - \sigma_A^*)[y + \phi(q_A^*)] + \sigma_A^*[y - T(1 + \theta) + \phi(q_A^*) - s_i]$$

will vote for the M-party. The latter inequality implies:

$$s_i > \underbrace{\frac{\phi(q_A^*) - \phi(q_M^*)}{\sigma_A^* - \sigma_M^*} - T(1 + \theta)}_{\alpha} \tag{A.2}$$

which is always verified whenever $q_M^* = q_A^*$. As given ρ - the probability of winning the elections - parties' rents are decreasing in q, and because setting $q_M = q_A$ suffices to win the elections, Party M never offers an equilibrium quality of the good publicly provided strictly greater than q_A^*. Therefore, in equilibrium, $\sigma_M^* < \sigma_A^*$, which implies $m_M^* < m_A^*$.

Notice that $E[D|\pi_M^*, \tilde{F}(S)] > 0$ trivially follows from the fact that, by assumption, party M chooses a policy granting budget balancedness under a distribution of S which is more favourable than the actual one.

$\square$

Proof of Remark 1

Proof. First consider a pair of policies $\hat{\pi}_A = (\hat{q}_A, \hat{m}_A), \hat{\pi}_M = (\hat{q}_M, \hat{m}_M)$, with $0 < \hat{q}_M = \hat{q}_A \leq q^{max}$ and $m_A > m_M > 0$.

By Proposition (1), the pair $(\hat{\pi}_A, \hat{\pi}_M)$ ensures that the M-party wins the elections. However, as rents are decreasing in q, as long as this does not affect ρ - the probability of winning the elections - Party M has an incentive to reduce its provision marginally. To see whether this might be the case, consider an hypothetical policy $\pi_M' = (q_M', m_M') \neq \hat{\pi}_M$, such that $q_M' < \hat{q}_M$ and $m_M' = \hat{m}_M$. Given $\hat{\pi}_A = (\hat{q}_A, \hat{m}_A)$ and $\pi_M' = (q_M', m_M')$:

    i) $\hat{\pi}_A \succ \pi_M'$ for any $s_i > s(\sigma_M)$;

    ii) $\pi_M' \succ \hat{\pi}_A$ for any s_i such that $s(\sigma_A) < s_i < \gamma$

    iii) $\pi_M' \succ \hat{\pi}_A$ for any s_i such that $\alpha < s_i < s(\sigma_A)$

Now, π_M' is better than $\hat{\pi}_M$ as a reply to $\hat{\pi}_A$ if the share of voters preferring π_M' to $\hat{\pi}_A$ is still greater than $\frac{1}{2}$, i.e. whether

$$\omega(\hat{\pi}_A, \pi'_M) = Prob\{\alpha < S < \gamma | (\hat{\pi}_A, \pi'_M)\} =$$

$$Prob\Big\{ \underbrace{\frac{\phi(\hat{q}_A) - \phi(q'_M)}{\hat{\sigma}_A - \sigma'_M} - T(1+\theta)}_{\alpha} < S < \underbrace{\frac{T}{\sigma'_M} - T(1+\theta) - \frac{\phi(\hat{q}_A) - \phi(q'_M)}{\sigma'_M}}_{\gamma} | (\hat{\pi}_A, \pi'_M) \Big\} > \frac{1}{2}$$

$$(A.3)$$

Notice that $\omega(\hat{\pi}_A, \hat{\pi}_M)$ was greater than $\frac{1}{2}$, and that, given $\hat{\pi}_A$ and m_M, $\omega(.)$ is a continuous strictly increasing function of q_M. Hence, as $\hat{m}_M = m'_M$, the M-party can reduce the provision of q below $\hat{q}_M = \hat{q}_A$ such that condition (A.3) still holds. Notice that as $q'_M < \hat{q}_M = \hat{q}_A$, monitoring can be reduced to the level $m''_M < \hat{m}_M < \hat{m}_A$. This in turn would permit party M to further reduce q_M to $q''_M < q'_M$ without violating (A.3).

Consider now a pair of policies $(\hat{\pi}_A, \hat{\pi}_M)$ and suppose they are equilibrium policies with $\hat{q}_M = \hat{q}_A$.

As $0 < \hat{q}_M = \hat{q}_A < q^{max}$ characterizes the equilibrium, the M party does not have incentive to change its policy. However, if this is the case, it means that if M reduced q_M marginally would loose the elections. Hence, it must be that $s(\hat{\sigma}_A) < s(\hat{\sigma}_A) < Median(S)$, i.e. for more than 50 percent of the population what only matters is the level of q.

However, if $s(\hat{\sigma}_A) < s(\hat{\sigma}_M) < Median(S)$ holds and the M-party plays $\hat{q}_M$, with $\hat{q}_M = \hat{q}_A < q^{max}$, then party A would have an incentive to change its strategy. Indeed, if it marginally increased the provision of q would win the elections. This means that $\hat{q}_M = \hat{q}_A < q^{max}$ cannot be true in equilibrium. Thus, any interior equilibrium is such that $0 < \hat{q}_M < \hat{q}_A < q^{max}$. By the same argument $\hat{q}_M = \hat{q}_A$ can be true in equilibrium where both $\hat{q}_M$ and $\hat{q}_A$ equal q^{max}. □

Proof of Proposition 2

Proof. If condition (**??**) holds, for any $\pi_M \neq \tilde{\pi}_M$, a rightward shift in the distribution of S increases q_A^{max} hence the equilibrium quantity of q. Suppose this condition does not hold, and suppose the equilibrium is such that $q_M^* < q_A^* < q_A^{max}$. As π_M^* is optimally chosen, it is not possible to marginally reduce q_M^* and win the elections

(given π_A^*). As a rightward shift in the distribution of S increases the portion of voters such that $s_i > s^*(\sigma) > \gamma$, q_M^* cannot be optimal any more, so that party M has to increase q_M^*. □

Appendix B

Appendix for Chapter 2

TABLE B.1: Literature review - main variables

Reference	Main accountant variables
Brown, 1993	Net saving index; current financial independence index; non financial budgetary results index; net debt index; fiscal revenues index
Capeci, 1994	Total intergovernal aids receipts from the state and federal government over equalized property value; total revenues minus debt service repayment over equalized property value; debt service repayment over equalized property value; total debt
Kloha, Weissert, and Kleine, 2005	Real taxable two year growth; general fund expenditure as a percentage of real taxable value; different types of fund operating deficit
Jones and Walker, 2007	Net debt service cost; total assets; employee costs; borrowing cost; total ordinary expenditure
Lobo, Ramos, and Lourenco, 2011	Interest expenditure over debt; average value of investment expenditure; municipal employees compensation; municipal own revenues per capita
Rossi, Zito, and Costanzo, 2012	Financial results over operating revenues plus long term loans reimbursement; personnel expenditure over current revenues; Financial expenditure over total current revenues; unpaid expenditure at the end of the year over long term debts reimbursement; un-cashed revenues of previous year over financial result; current financial equilibrium; total unpaid operating expenditure over commitments by operating expenditure
Cabaleiro, Buch, and Vaamonde, 2013	Debt service per capita; debt interest per capita; debt service divided by current revenues; capital transfers received per capita
Brusca, Rossi, and Aversano, 2015	Debt per capita; debt over GDP; debt over operative revenues; debt service over operating revenues; operative revenues minus operative expenditure over operative revenues; operative expenditure over operative revenues; operative revenues minus operative expenditure, over payments for debt; personnel expenditure over operative revenues; fiscal revenues per capita; fiscal revenues over GDP; fiscal revenues over operative revenues
Cohen, Costanzo, and Manes-Rossi, 2017	Personnel expenses over current revenues; interest expenses over current revenues; current revenues over financial liabilities; short term liabilities over current revenues; operating expenditure over current revenues
Winarna, Widagdo, and Setiawan, 2017	ROA;ROE; debt over revenues; road program costs over total assets; total revenues minus total expenditure, over total revenues; current assets minus current liabilities over tot assets; total fund balances over total fund revenues; total net assets over tot revenues
Gregori and Marattin, 2019	Loan repayment over current spending; loan repayment over capital spending; current revenue over current spending; tax revenue over current spending;positive residuals over total revenues; personnel spending over current spending

TABLE B.2: Variables' description

Name	Variable description	Source	N	Mean	St. Dev.	Min	Median	Max
Outcome variables								
Distress	dummy for municipal financial distress	Ministry of Domestic Affairs	7039	0.026	0.158	0	0	1
Proxy for civicness								
Dissolution	council dismissal due to Mafia infiltration	Ministry of Domestic Affairs	7039	0.025	0.157	0	0	1
Volunteers	percentage of inhabitants engaged in non-profit organizations	ASC	7039	9.449	9.407	0.000	7.759	342.466
Vot_mean	average voter turnout between referenda held in 2009 and in 2016	Ministry of Domestic Affairs	7039	26.350	7.728	5.642	24.709	61.396
Assets_index	ratio between definitively confiscated real estate assets and the total amount of real estate at municipal level	ANBSC	7033	0.0638	0.4351	0	0	16.1822
Socio-economic and demographic variables								
HouseSize	percentage of family with more than three members	ASC	7039	0.456	0.100	0.050	0.470	0.790
EmplRate	employment rate	ASC	7039	43.095	8.676	14.880	44.470	71.430
Popdens	resident population divided by municipal surface	ISTAT	7039	279.104	613.685	0.000	104.779	13092.810
Perc_RD	municipal percentage of recycling	ISPRA						
Budget indicators								
Int_Rev	debt interest payments over total current revenues	AIDA PA	7039	0.011	0.018	0	0	1
ServExp_TotExp	ratio of service expenditure over total expenditure	AIDA PA	7039	171.704	116.979	0.000	156.311	2072.628
Rev_Exp	ratio between current revenues and total spending	AIDA PA	7039	0.339	5.050	0.000	0.240	416.478
Active_residuals	active residuals over current revenues	AIDA PA	7039	0.90	0.59	0.12	0.73	9.95
PersExp_Rev	ratio between personnel spending and current revenues	AIDA PA	2411	0.300	0.0862	0.001	0.292	0.725
Autonomy_index	ratio between tax revenues and current spending	AIDA PA	7039	0.6232	9.0735	0.0000	0.4790	726.7954
Waste_ServExp	ratio between waste management expenditure and service expenditure	AIDA PA	7039					

FIGURE B.1: Correlation plot
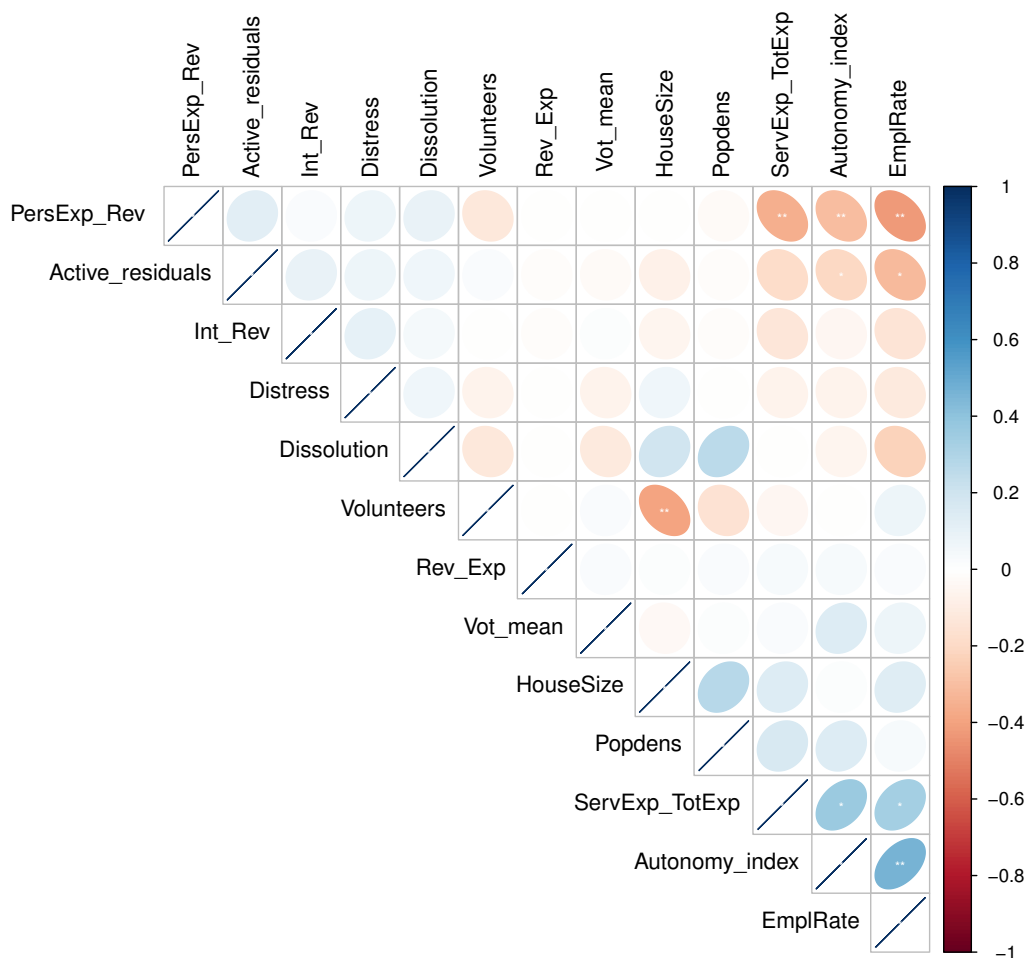
TABLE B.3: Relative poverty share with respect to household size - reference period

Household size/Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
						Relative poverty share							
1 member	11.3	10.7	10.1	10.7	9.3	9.9	9.6	8.2	7.8	7	8	7.1	5.8
2 members	11	10.7	10.2	10.6	10.2	9.8	9.2	9.5	9.2	8.8	9.3	9.9	9
3 members	8.2	7.1	6.2	8	7.4	7.1	7.7	7.4	7.9	8.4	9	10.5	11
4 members	10.2	9.2	9.1	10.8	10.3	9.7	9.9	11.4	10.7	12.2	10.7	14	15.8
5 and more members	19.8	18.7	18	18.5	21.2	17.7	18.2	20.9	19.4	21.5	22.8	24.8	26.5

Source: ISTAT.

FIGURE B.2: Optimal number of cluster - Silhouette method
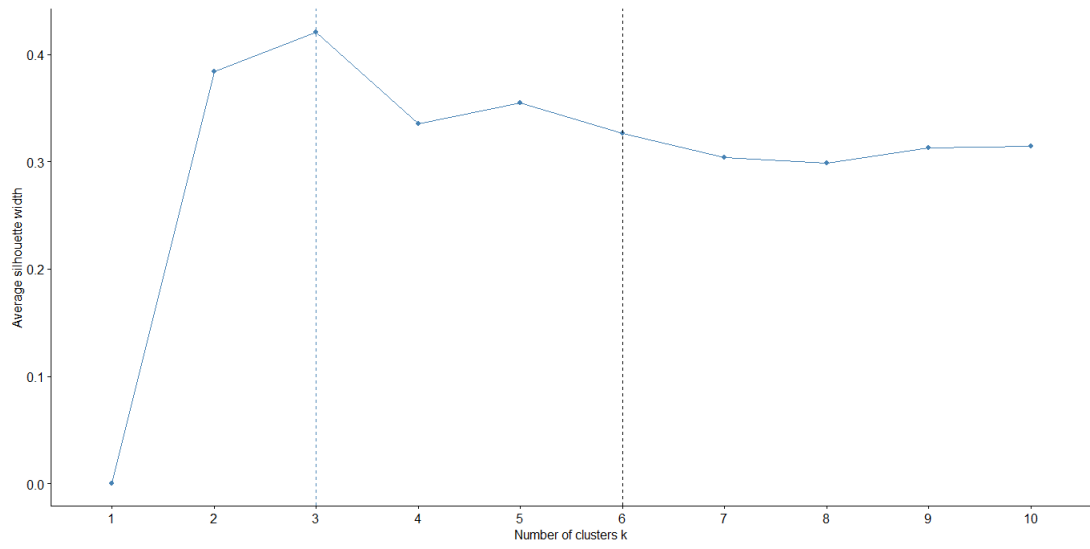
Appendix C

Appendix for Chapter 3

TABLE C.1: Descriptive statistics - main variables

Name	Variable description	Source	N	Mean	St. Dev.	Min	Median	Max
Outcome variables								
Performance_index	median of the days between the date of definitive confiscation and the date of re-allocation	own elaboration with ANBSC data	4472	1748.431	1321.500	167	1559	8033
Permeability_index	number of definitively confiscated real estate assets per thousand inhabitants	own elaboration with ANBSC data	4472	2.792	5.204	0.005	1.212	46.455
Explanatory variables								
Area	dummy variable which takes value 1 for confiscated assets placed in the sub-urban/rural area	own elaboration with ANBSC data	4472	0.568	0.495	0	1	1
Recipient	dummy variable which takes value 1 if the confiscated property is allocated to local authority of government	own elaboration with ANBSC data	4472	0.816	0.388	0	1	1
Category	dummy variable which takes value 1 if the confiscated assets is a real estate for residential use and similar	ANBSC	4472	0.605	0.489	0	1	1
Assets_index	ratio between definitively confiscated real estate assets and the total amount of real estate at municipal level	own elaboration with ANBSC data	4472	0.467	0.995	0.001	0.206	7.849
DemoSize	dummy variable which takes value 1 if the municipality has more than one hundred thousand inhabitants	own elaboration	4472	0.198	0.398	0	0	1
EduRate	share of citizens who do not complete compulsory education	ISTAT	4472	2.149	1.216	0.000	1.766	6.711
EmplRate	employment rate	ASC	4472	36.376	6.020	26.404	35.264	60.647
Debt_index	incidence of interest expenditure over total municipal expenditure	AIDA PA	4427	0.00917	0.0158	0.0000	0.0000	0.1300
Nonprofit	total number of non-profit organizations at municipal level	ISTAT	4459	508.065	1161.416	1.000	70.000	12436.000
Foundation	number of non-profit organizations with a legal status of foundation	ISTAT	2452	26.896	77.510	1.000	4.000	604.000
Ass_recognized	number of non-profit organizations with a legal status of recognized association	ISTAT	4434	114.189	252.306	1.000	19.000	2737.000
Ass_noricognized	number of non-profit organizations with a legal status of not recognized association	ISTAT	4456	386.010	882.032	1.000	55.500	9277.000
Social_cooperative	number of non-profit organizations with a legal status of social cooperative	ISTAT	3935	41.089	78.992	1.000	9.000	712.000
Other_nonprofit	number of non-profit organizations with other kind of legal status	ISTAT	3895	38.711	89.132	1.000	6.000	1024.000
Proxy for civicness								
Dissolution	dummy for council dismissal due to mafia infiltration	Anti-Mafia Commission	4472	0.441	0.497	0	0	1
Volunteers	percentage of inhabitants engaged in non-profit organizations	ASC	4459	3.944	2.537	0.260	3.493	16.498

TABLE C.2: Number of re-allocated real estate assets - by year

Year	N. assets
1997	1
2004	3
2007	2
2008	1
2009	3
2010	3
2011	4
2012	1
2013	16
2014	9
2015	25
2016	162
2017	2131
2018	2106
2019	5

TABLE C.3: Demographic ranges

N. inhabitants in thousands	Demographic ranges
less than 500	1
500 - 999	2
1.000 - 1.999	3
2.000 - 2.999	4
3.000 - 4.999	5
5.000 - 9.999	6
10.000 - 19.999	7
20.000 - 59.999	8
60.000 - 99.999	9
100.000 - 249.999	10
250.000 - 499.999	11
500.000 and more	12

Source: Ministry of Domestic Affair.

TABLE C.4: Effect of non-profit organizations on re-allocation timing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Dependent variable:			
				Performance_index			
Area	296.871***	306.358***	319.407***	287.090***	254.447***	261.144***	193.212***
	(41.290)	(41.668)	(56.659)	(57.783)	(57.744)	(58.795)	(61.536)
Recipient	147.515***	139.555***	236.603***	243.425***	200.707***	195.584***	215.606***
	(38.940)	(38.375)	(46.114)	(45.773)	(45.870)	(46.335)	(46.485)
Category	−270.034***	−203.198***	−300.392***	−310.364***	−339.199***	−336.904***	−360.859***
	(45.783)	(48.921)	(74.826)	(74.781)	(74.984)	(76.526)	(78.341)
Assets_index	−181.343***	−198.179***	88.931	42.586	334.582**	264.604	415.742**
	(9.204)	(9.055)	(144.601)	(147.501)	(168.149)	(173.103)	(178.783)
Interest Expenditure (Int_Rev)	4885.510***	4353.832***	12469.240***	13177.340***	13969.650***	12656.800***	14520.300***
	(931.545)	(909.530)	(1557.679)	(1549.875)	(1598.045)	(1979.978)	(1946.051)
DemoSize		−301.173***	−342.229***	−533.188***	−627.714***	−461.093***	−745.441***
		(37.916)	(57.766)	(67.365)	(68.316)	(114.255)	(107.466)
Foundation			0.344***	−1.991***	−1.384***	−0.625	−2.446***
			(0.129)	(0.380)	(0.415)	(0.576)	(0.518)
Ass_recognized				0.781***	−4.443***	−4.707***	−3.931***
				(0.136)	(0.777)	(0.742)	(0.707)
Ass_noricognized					1.504***	2.019***	3.251***
					(0.217)	(0.249)	(0.337)
Social_Cooperative						−6.521**	−11.267***
						(2.617)	(2.583)
Other_nonprofit							−8.977***
							(1.158)
Constant	1669.190***	1702.805***	1645.232***	1646.393***	1679.952***	1744.547***	1741.411***
	(54.755)	(53.465)	(85.896)	(85.779)	(85.036)	(90.400)	(90.735)
Observations	4427	4427	2430	2429	2429	2382	2350
R²	0.054	0.061	0.079	0.083	0.094	0.097	0.107
Adjusted R²	0.052	0.060	0.076	0.080	0.090	0.093	0.103
Residual Std. Error	1286.300 (df = 4421)	1281.401 (df = 4420)	1324.732 (df = 2422)	1322.471 (df = 2420)	1314.874 (df = 2419)	1319.944 (df = 2371)	1317.596 (df = 2338)
F Statistic	50.029*** (df = 5; 4421)	47.821*** (df = 6; 4420)	29.673*** (df = 7; 2422)	27.265*** (df = 8; 2420)	27.744*** (df = 9; 2419)	25.373*** (df = 10; 2371)	25.414*** (df = 11; 2338)

Note: *p<0.1; **p<0.05; ***p<0.01

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