The Effects of Social Capital on Government Performance and Turnover: Theory and Evidence from Italian Municipalities*

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Abstract

This paper makes three contributions. First, it presents a theoretical analysis of how social capital, formalized as trust in politicians, impacts on government performance and turnover, employing a political agency model with both moral hazard and adverse selection. Second, it presents novel measures of both local government performance and on social capital at the Italian municipality level, using administrative data and an online survey respectively. Third, empirical results are consistent with the main predictions of the theory; higher social capital improves government performance, both in the first and second terms in office, but also increases turnover of incumbent mayors.

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1 Introduction

It is now widely accepted that social capital, classically defined by Robert Putnam as "connections among individuals — social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam, 2000) can have an important effect on economic outcomes. For example, social capital has been shown to strongly correlate with economic growth (Helliwell and Putnam, 1995; Knack and Keefer, 1997; Zak and Knack, 2001), trade (Guiso et al., 2008), well-functioning institutions (Putnam, 2000; Knack, 2002), public services outcomes such as educational achievement (Coleman, 1988), and financial markets (Guiso et al., 2004), health (Wilkinson, 1996), longevity (Putnam, 2000), income equality (Wilkinson, 1996; Kawachi et al., 1997), child welfare (Côté and Healy, 2001), economic achievement through increased trust and lower transaction costs (Fukuyama, 1995), and financial development (Guiso et al., 2004), corruption and crime (Halpern, 1999; Putnam, 2000; Uslaner, 2002; Buonanno et al., 2009)

In this paper, we focus on one type of outcome that has received relatively little attention; the effect of social capital on the dual role of elections, which are to provide incentives for incumbents and to select good politicians for office. This paper makes two contributions in understanding the link between social capital and the effects of elections.

First, it presents a theoretical analysis with two new features. The first is in our modelling of how social capital impacts the effects of elections. In brief, key existing papers focus either on the "preference" channel, where voters with high social capital are assumed to care about aggregate welfare (Nannicini et al., 2013) or the "information" channel, where high social capital voters are assumed to be better informed about policies (Ponzetto and Troiano, 2018). However, neither policy knowledge nor concern for others' welfare is *intrinsic* to the standard concept of social capital, which is classically defined in terms of interpersonal trust and norms of civic cooperation (Knack and Keefer, 1997).

In this paper, our primary concept of social capital is that of (lack of) trust in politicians, which we argue below in Section ?? is intrinsic to the standard definition of social capital. We formalize it as the *degree to which voters underestimate the true probability* that the politicians are concerned with voter welfare rather than their own interests. However, for purposes of comparison, we also allow for the "preference" and "information" channels in our model.

Second, unlike these two papers, our setting is an infinite-horizon model of *both* moral hazard and adverse selection, and so can make testable predictions about equilibrium turnover, as well as performance when in office.[1] In both these respects, our theoretical contribution

[1] As is well-known, predictions about turnover in two-period models are problematic, as in the second

extends existing literature, as explained in more detail in Section 2 below.[2]

Our findings are as follows. First, it can be shown that our primary measure of social capital, (lack of) trust in politicians, unambiguously leads to both worse discipline and worse selection effects of elections. The testable implication is that in both the first and second terms of office, incumbent performance is unambiguously lower with lower social capital.[3] The effect of (lack of) trust in politicians on turnover is ambiguous, but for a wide range of parameter values - as long as bad politicians do not fully pool with good ones- lack of trust will lead to lower turnover.

Second, in our setting, the information channel always reduces first-term performance, but has an ambiguous effect on second-term performance. The effect on turnover is also generally ambiguous, but better knowledge unambiguously increases turnover if voters fully trust politicians. So, the effects of trust and information are qualitatively different. Finally, concern for aggregate welfare, modelled following Nannicini et al. (2013), has no effect whatsoever on the political equilibrium. This striking conclusion is further discussed in Section 2 below, but is essentially due to the fact that in the pure moral hazard model of Nannicini et al. (2013), voters can commit ex ante to a re-election rule because they are indifferent ex post about who to vote for, whereas in our model with adverse selection, this indifference no longer holds.

Our second contribution is empirical. We bring our predictions to the data using original data on government performance and social capital for Italian municipalities. At the end of 2013, the Italian government produced performance indicators for over 6,000 municipalities by integrating information provided by official sources with new data generated by a questionnaire, in which each local authority was asked detailed information about each service provided. This information was used to construct a performance index which measures how efficiently each municipality uses its financial resources for the provision of essential services.[4] We also use an output index calculated from the same survey, measuring the volume of different services provided.

We also use an innovative measure of social capital, which adjusts for the fact that social capital in Italy may not be exogenous. Specifically, a potential problem is that social capital may be higher in municipalities or provinces where governance is better, partly as a result of that better governance. To avoid this endogeneity problem, we leverage the results of an

period, the voter is comparing two "lame ducks". ((Besley, 2006))

[2]Our model is one of both moral hazard and adverse election, so we can make predictions about the effect of social capital on the re-election of incumbents, not just their performance while in office.

[3]Incumbents can serve a maximum of two terms, as in Italian municipalities.

[4]The calculation of these indices is based on the gap between standard and actual expenditure for each service. This provides a good reference point to judge the level of expenditure of each municipality against the level of expenditure of other local authorities.

online survey. This survey is described more fully in a companion paper, Sgroi et al. (2020), and shows that the social norms of individuals are strongly determined by the average social norms of the provinces where they or their relatives, especially their mothers and maternal grandmothers, were born. We construct measures of social capital based on this maternal transmission mechanism, which can avoid the endogeneity problem, and employ them as instruments for a more conventional measure of social capital.

Our empirical findings are as follows. First, regarding performance, we find that the performance of incumbent mayors is generally higher in municipalities with higher social capital in both their first and second terms of office, as predicted by the theory. However, this effect is stronger when incumbent mayors are not term-limited. We see the same effects for the output index. This is as predicted by our theory, and is to our knowledge, the first study to show that the efficiency with which goods and services are delivered is related to social capital. From the theory, the stronger effect for first-term mayors implies that the effect of social capital on discipline dominates its effect on selection.Second, as broadly predicted by the theory, the unconditional probability of retaining office (i.e. not conditional on performance) is robustly lower in municipalities with high social capital.

2 Related Literature

First, we contribute to the theoretical literature on social capital and elections, in particular Nannicini et al. (2013) and Ponzetto and Troiano (2018). Our model is quite different from Nannicini et al. (2013) in two major respects. First, in their set-up, there is no adverse selection i.e. politicians do not differ in unobservable type. In fact, all politicians are "bad", that is, rent-seeking. This means that their model does not generate predictions about how the probability of re-election varies with social capital. Indeed, in their theoretical model, the incumbent is always re-elected in equilibrium. Second, they assume that social capital influences politics only through the preference channel, i.e. that voters with high social capital have more altruistic or civic preferences.

Reflecting this difference in assumptions, the main prediction of their model is also different to ours; with low social capital, incumbents get higher rents. This result is generated by the fact that without civic preferences, different groups of voters can be "bought" by implicit promises of group-specific transfers. In our model, this mechanism is not operative, as voters cannot precommit to a voting rule in advance of policy, but will vote on the basis of their posterior beliefs. As a consequence, even though fiscal policy in their model and ours is the same, the extent of civic preferences has *no* impact on the behaviour of bad incumbents in equilibrium (see Proposition 1 below).

Ponzetto and Troiano (2018) study the effect of the information channel. Specifically, low social capital voters do not observe a public investment good set in a given year (education in their model) until after the election in that year. This creates biased incentives for the incumbent; provision of a public consumption good, which *is* observable prior to the election, has a relatively higher electoral return than does the investment good, so politicians under-provide the investment good. A limitation of their model, relative to ours, is that ex ante, all incumbents are identical and policy is chosen before an incumbent-specific productivity shock is drawn. As a result, there is no scope for incumbents to signal their type. If stationarity is assumed, as Ponzetto and Troiano (2018) do, this leads to the conclusion that the probability of the incumbent retaining office in equilibrium is just one half. So again, they do not provide predictions on the effect of social capital on turnover. In contrast, we show that information generally impacts turnover, and unambiguously increases it if voters are not low-trust.

Second, our main empirical results contribute to the literature on the correlations between social capital and the behaviour of politicians while in office. For example, Nannicini et al. (2013) show that in parliamentary districts of Italy with higher social capital, incumbent representatives have lower absenteeism rates and are less likely to face accusations of criminal wrong-doing. We focus not on the personal conduct of incumbents, but on actual policy achievements when in office. In this respect our results are more similar to Padró i Miquel et al. (2015), who show that that Chinese villages with higher social capital experienced larger increases in public goods after the introduction of elections, and Ponzetto and Troiano (2018), who show that there is a positive relationship at the country level between social capital and spending on education. However, our results are not just about the level or type of public goods, but also about the efficiency with which they are provided. To our knowledge, this is the first paper to show that social capital increases the efficiency by which government spending is transformed into outputs.

Third, a distinctive feature of our paper is that it focuses both theoretically and empirically on the effect of social capital on the effectiveness of elections as a *selection* device, by developing and testing the hypotheses about incumbent turnover and vote share described above. These results relate to the findings of Nannicini et al. (2013), who consider how the probability of re-election of Italian parliamentary representatives varies with personal conduct while in office (absenteeism, accusations of criminal wrong-doing). However, there are three differences. First, the results of Nannicini et al. (2013) concern personal conduct while in office, whereas our results concern the provision of services and taxation, which is arguably of greater significance for society. Second, the empirical relationships Nannicini et al. (2013) test for, are *not* predicted by their theory, which only predicts that the vote

share for the incumbent is (weakly) increasing in social capital.[5] Third, our finding that the turnover of incumbents is *increasing* in social capital is the opposite finding to theirs.

Our work also relates to a small literature on the determinants of government efficiency (Asatryan and De Witte, 2015; Coffé and Geys, 2005; Geys, 2006; Geys et al., 2010; Knack, 2002) The closest to our work are Knack (2002) and Coffé and Geys (2005). Both of these relate measures of social capital to measures of the quality of government, for US states and Flemish municipalities respectively. Our work arguably has advantages to both these studies. First, we use a very precise measure of local government performance based on an administrative survey. Geys (2006) simply use municipal deficits as a measure of efficiency, which is not clearly related to the usual definition of government efficiency. Knack (2002) use a measure based on a very large number (35) of criteria, some of which do not relate at all to expenditure and service provision, so their measure is much less precisely targeted than ours. Second, unlike these papers, we have panel data, allowing us to look at the effect of the electoral cycle on efficiency,

Finally, we contribute to the large literature on the measurement of social capital and its correlation with other related variables.[6] Typically, social capital is measured either through the use of survey questions about trust and social norms on cooperation such as the World Value Survey (Knack and Keefer, 1997; Knack, 2002) or by the use of data on behaviours associated with social capital, such as blood donation or electoral turnout (Guiso et al., 2004; Nunn and Wantchekon, 2011; Nannicini et al., 2013), participation in voluntary associations (Putnam et al., 1993) or the payment of low-stakes, low-enforcement taxes such as the TV licence (Bracco et al., 2015). Our leading measure of social capital combines these traditional measures and adds to it through a bespoke survey. The results of this survey show that measures of social capital at the individual level are strongly correlated with the social capital of the provinces where individuals or their relatives, especially their mothers and maternal grandmothers, were born. Leveraging this, we are able construct a social capital measure that is more exogenous to the local environment.

[5]Specifically, empirical specifications (10) and (11) in their paper have an interaction term between personal conduct measures and social capital which is not implied by their theory; all that the theory predicts is that the level effect of social capital on the dependent variables in (10) and (11) should be positive.

[6]Our contribution to measurement is the main focus of our companion paper Sgroi et al. (2020).

3 A Theoretical Framework

3.1 Trust in Politicians, Political Knowledge and Civic Preferences

Our theoretical approach will model three mechanisms by which social capital can affect government behaviour; trust in politicians, political knowledge and civic preferences. Here, to motivate our approach, we briefly report on evidence from our online survey of residents of Rome, Milan and Turin which shows a positive association between the usual measures of social capital and these three mechanisms.[7]

As already remarked, most classic definitions of social capital emphasise two aspects; trust and norms of cooperation. In Table 1 below, we show that trust and norms of cooperation, as measured in a variety of ways in our survey, are positively correlated with all three measures: trust in politicians, political knowledge and civic preferences.

We measure trust and norms of co-operation in various ways, using questions similar to those asked in the World Value Survey and the Eurobarometers. First, we ask respondents to self-report the level of trust towards family members, friends, neighbours, people with roots from the same town, people residing in the same neighbourhood, town etc. We also include questions on respondents' beliefs in the overall level of trust, honesty and cooperation in people. We also assess trust in a less direct way by asking what is the likelihood that a wallet with 200 Euros left on a bus will be returned.

We measure trust in politicians by a survey question. For political knowledge, we use the first prioncipal component of two indicators, the self-reported level of interest in politics and the survey response that reading newspapers is the main source of political information. We measure willingness to contribute by the respondent's contribution to a standard public good game.

Table 1 is quite striking in that it shows that almost all these measures have a significant positive association with our measures of willingness to contribute to public goods and political knowledge. Our conclusion is that this provides evidence to motivate an analysis of how social capital impacts elections via all three of these channels. That is what we do in the theoretical model, to which we now turn.

[7]For details on the survey see Sgroi et al. (2020).

Table 1: Correlations between Social Capital, Trust in Politicians, Political Information and Willingness to Contribute to Public Goods

Correlations	Trust Politicians	Political Information Index	PG Contribution
Agree: most people are honest	0.139***	0.153***	0.109***
Agree: most people are helpful	0.144***	0.115***	0.082***
Agree: most people are trustful	0.134***	0.130***	0.074***
Wallet Lost on Bus	0.206***	0.140***	0.119***
Trust Family	-0.077***	0.076***	0.021
Trust Neighbours	0.184***	0.133***	0.089***
Trust Strangers	0.315***	0.138***	0.065**
Volunteering	0.162***	0.110***	0.055**

Note:* $= p < 0.1$, **$= p < 0.05$, *** $= p < 0.01$. Data are collected from a survey conducted in April 2019 among 1549 Italian respondents living in Rome, Milan, Turin. Detailed information on the survey are in Sgroi et al. (2020). Agree: most people are honest, try to help and can be trusted is equal to 1 if the respondent agrees with the above statements and 0 otherwise. The Trust questions refer to the level of trust in each of the above groups (from 0 no Trust to 5 high trust). "Wallet lost bus" indicates the answer to the following question: "Imagine you have left your wallet with 200 Euros on the bus, from 1 to 10, (1= completely unlikely , 10 =almost certain) how would you evaluate the likelihood that it will be returned?". "Volunteering" is a score from 0 to 22 indicating the levels of membership of, monetary contributions to, and activities in voluntary associations. Political Information Index is the first principal component of (i) "Interest in Politics", the self reported level of interest in politics and current affairs, [0-10]; (ii) "Press Information", a dummy variable equal to 1 if the self-reported main source of political information channel is newspaper readership."PG contributions" are the individual contributions towards a public good, between 0 and 20 Euros in an online contribution game.

3.2 Set-Up of the Model

Preliminaries. There are an infinite number of periods $t = 1, 2..$ In each period, an incumbent politician raises tax revenue, provides a public good, and makes non-negative transfers, as described further below. The public good is produced via the production function

$$g_{t+1} = e_t + E_t, \tag{1}$$

where g_t is the level of the public good at period t, e_t is effort, and E_t is monetary exepnditure of the public good. Note that there is a time-lag in the production. This captures lags between resources devoted to improvements in public services, and outcomes. In this context, there are several interpretations of e_t, as Italian municipalities provide a variety of services. For example, if the public good is nursery school education, one can think of e_t as the effort exterted on recruiting additional workers, finding additional premises, etc. This will lead to

an improvement in services, but with a time lag.

There is an election at the end of every period, where the incumbent faces a challenger. Each politician can serve for at most two periods i.e. there is a two-term limit, the rule which applies to most municipalities in Italy.

Citizens. The are overlapping generations of citizens, each of whom live for two periods. Each generation comprises a continuum of size one. Following Nannicini et al. (2013), we assume that within each generation, that there are J groups in the population, and the incumbent, as well as providing a public good, can make non-negative targetted transfers $\{\tau_{1,t}, ..\tau_{J,t}\}$ to each group at time t, funded out of a lump-sum tax T_t on all citizens. A voter in group j is said to be *non-civic* if his payoff at t is $u(g_t) + \tau_{j,t} - T_t$, and *civic* if his payoff is equal to the average utility across all groups i.e. $u(g_t) + \overline{\tau}_t - T_t$, where $\overline{\tau_t}$ is the average transfer at t. We assume that u is strictly increasing and strictly concave and that $u(0) = 0$ We assume again following Nannicini et al. (2013), that a proportion χ of citizens in each group is civic.

All citizens observe tax, and transfers $\{T_t, \tau_{1,t}, ..\tau_{J,t}\}$ before the election at time t. Moreover, with probability $0 < \sigma < 1$, any citizen observes the "hidden" activities of the incumbent, e_t and rent-diversion r_t *before* the election at time t. The event that e_t, r_t is observed also independent across voters at a point in time, and across time.[8] The modelling of the knowledge aspect is very similar to Ponzetto and Troiano (2018).[9]

Voting. We will assume that at any election, only the young citizens vote. This is without real loss of generality, as old citizens do not care about next period's fiscal policy. When voting, young citizens evaluate the incumbent on the basis of both policy and non-policy preferences. Specifically, a citizen K will vote for the incumbent i iff

$$V^{inc} + v_K + \omega \geq V \tag{2}$$

Here, V^{inc}, V are the continuation policy payoffs for a citizen from electing the incumbent and challenger respectively, and v_K, ω are individual and aggregate preference shocks, as in Persson and Tabellini (2002). We assume that v_K, ω are distributed uniformly on $\left[-\frac{1}{2}, \frac{1}{2}\right], \left[-\frac{1}{2\gamma}, \frac{1}{2\gamma}\right]$ respectively. Note that V^{inc} will depend on whether the voter observes e_t, r_t or not, as explained below.

[8] If e_t, r_t is not observed before the election at t, it can be eventually backed out in $t+1$ via the production function and government budget constraint as g_{t+1} is observed in the next period. But, by then the information conveyed by e_t, r_t will be useless, as that politician, if he won the election at t, will have to retire at the end of $t+1$ anyway.

[9] In Ponzetto and Troiano (2018), there are two types of voters, informed and uninformed. Our model can also be interpreted in this way i.e. the mathematics of the model is the same if we suppose that a fraction σ of the voters always observe effort, and a fraction $1-\sigma$ do not.

Politicians. There is a large pool of politicians, who can be good or bad. The true ex ante probability of any politician being good is π. We assume that voters *mispercieve* this probability; specifically, their subjective belief that the incumbent is good is $\beta\pi$, where without loss of generality, we assume that $\beta \leq 1$. If voters $\beta < 1$ are low-trust. So, β is our key measure of social capital, interpreted as trust.

Politicians differ in their preferences. Good politicians care about voter welfare i.e. the average utility of voter welfare across groups. The bad has a payoff $R + r_t$ from office in t, where R is an exogenous ego-rent from office, and r_t is pecuniary rent from the public purse. All politicians have a cost of effort $c(e_t)$, which is strictly increasing a strictly concave in e and $c(0) = 0$. The tax, expenditure on the public good, transfers, and rents are linked by the government budget constraint:

$$T_t = (1 + \delta)\left(E_t + \sum_{j=1}^{J} \tau_{j,t} + r_t\right) \tag{3}$$

Here, $\delta > 0$ is a deadweight loss of taxation, introduced to ensure that the good politician's policy choice is determinate: if $\delta = 0$, a good incumbent is indifferent about making transfers or not. Finally, as is standard, there is an upper bound on taxation $T \leq \overline{T}$ which prevents the bad incumbent expropriating the citizens.

Order of Events. The order of events within a period is as follows. First, the incumbent chooses effort, rents and fiscal policy $\{e_t, r_t, E_t, T_t, \tau_{1,t}, ..\tau_{J,t}\}$ subject to (1) and (3). Then, all voters observe $\{T_t, \tau_{1,t}, ..\tau_{J,t}\}$ and observe e_t, r_t with probability σ.[10] Then, if the incumbent is in his first term of office, the young citizens vote for the incumbent or a challenger. If the incumbent wins the election, he serves for another period. If he loses, he is replaced by a challenger. If the incumbent is in his second term of office, he is replaced by a challenger randomly drawn from the distribution.

3.3 Discussion

The key feature of our model is that all voters are characterized by a triple (β, σ, χ) measuring the trust, knowledge, and preference aspects of social capital respectively. Modeling of the preference and knowledge aspects follow Nannicini et al. (2013) and Ponzetto and Troiano (2018) as closely as possible, to facilitate comparison to existing results. In particular, if effort is taken out of the model, all politicians are bad i.e. $\pi = 0$, rent is observable i.e. $\sigma = 1$, and there are only two periods, our model reduces to *exactly* the Nannicini et al.

[10] Before the election at t, voters also observe g_{t-1}, but this has no bearing on their voting decision as it conveys no information about the type of the current incumbent in his first term.

(2013) model.

The model has has been constructed to match the Italian institutional setting and data. For example, we assume two-term limits for politicians, and the incumbent chooses a variable e_t that corresponds to the performance index discussed in Section 5.2.

Finally, several features of the model, which appear at first sight to be complications, deserve comment. First, following Besley (2004), we assume an infinite horizon, rather than two periods, to avoid the unrealistic feature of two-period models that in the election at the end of the first period, the voter has to choose between two "lame duck" candidates each of whom can only serve one more term. Instead, our set-up allows the voters to choose between the term-limited incumbent and a challenger who can serve two terms.[11]

We introduce probabilistic voting for two reasons. First, it is more realistic; it allows voters to trade off policy payoffs against other considerations when voting. Second, without probabilistic voting, the re-election probability for the incumbent, and other outcomes, will generally depend in an arbitrary way on how we break indifference ties for uninformed voters.[12]

3.4 Equilibrium

An equilibrium of the model is a series of actions and voting decisions such that voters use Bayes' rule and both voters and politicians optimize. We will focus on equilibria in which the actions of politicians are time invariant, depending only on the state of the world, the type of the politician, and the term that the politician is serving.

The Good Incumbent

At time t a good incumbent wants to choose effort,rent and fiscal policy $\{e_t, r_t, E_t, T_t, \tau_{1,t}, ..\tau_{J,t}\}$ to maximize voter welfare, minus the cost of effort. Clearly, the good incumbent will set $r_t = 0$. Also, because of the deadweight loss of taxation, the good incumbent will never use transfers i.e. will always set $\tau_{j,t} = 0$. Then, voter welfare can be obtained by combining (1),

[11] An overlapping generations structure is sufficient for this choice, as at any election, young citizens will look forward by one period. Our results can also extended - at the cost of considerably more algebra - to the case of infinitely lived voters. These are available on request.

[12] For example, without probabilistic voting, and assuming that voters have no non-policy preference between the incumbent and challenger, we can suppose that half of the uninformed voters will vote for the incumbent. Then, the share of votes for the incumbent would be $(1-\sigma)0.5 + \sigma I_{[e=e^*]}$, where $I_{[e=e^*]}$ is an indicator variable that is 1 if and only if $e = e^*$. So, whatever σ, the probability of winning the election will be 1 if $e = e^*$, and zero otherwise. Alternatively, if we follow Besley (2006), Chapter 3.4.2 and suppose that if indifferent, uninformed voters always vote for the incumbent, the share of votes for the incumbent would be $(1-\sigma) + \sigma I_{[e=e^*]}$. Now, if $\sigma < 0,5$, there is no electoral penalty for low effort, but if $\sigma > 0.5$, the probability of winning the election will be 1 if $e = e^*$, and zero otherwise.

(3) with the voter payoff from T_t, g_{t+1}, to get $u(g_{t+1}) - (1+\delta)(g_{t+1} - e_t)$. Subtracting the cost of effort gives an objective for the good politician in office at time t of the form

$$u(g_{t+1}) - (1+\delta)(g_{t+1} - e_t) - c(e_t)$$

Maximising this expression with respect to e_t, g_{t+1}, we see that the good incumbent will set $g_{t+1} = g^*, e_t = e^*$ where

$$u'(g^*) = c'(e^*) = 1 + \delta$$

So, the level of the public good is determined independently of the cost of effort; a lower cost of effort will simply reduce the tax, which is of marginal benefit of $1+\delta$ to the voters. Therefore, theexpenditure and tax set by the good incumbent are $E^* \equiv g^* - e^*, T^* \equiv (1+\delta)E^*$ respectively.

Note that because $\{T_t, \tau_{1,t}, ..\tau_{J,t}\}$ are observable to all voters, a bad incumbent who deviates from the good incumbent's setting of these variables immediately reveals himself to be bad. So, the only decision of the bad incumbent will be whether to imitate the good incumbent by making high effort and extracting zero rent or not. This choice is further analysed below.

Voters

The analysis of voter behaviour is straightforward but somewhat lengthy, and the details are in the Appendix. Here, we just present the relevant outcome for the incumbent i.e. the probability of re-election, conditional on effort and rent. As a preliminary, we define u_0, the baseline level of voter utility from an incumbent who makes zero effort and takes maximum rent, and Δu, the voter's utility gain from the incumbent who makes efficient effort and takes zero rent. These are, respectively:

$$u_0 \equiv -\overline{T}, \ \Delta u \equiv u(e^* + E^*) - E^* + \overline{T} \tag{4}$$

Here, Δu measures voter willingness to pay good efficient effort and expenditure and zero rent. Then, it is easily computed (see the Appendix) that the probability of the incumbent winning, conditional on a choice of e, r is

$$p(e,r) = \frac{1}{2} - \underbrace{\gamma\,(V - u_0 + \beta\pi\Delta u)}_{\text{lame duck}} + \underbrace{\gamma\sigma\Delta u(\Pr(i = good\,|e,r\,) - \beta\pi)}_{\text{performance bonus}}, \tag{5}$$

Here, as above, V is the the per period continuation value to the voter from appointing a new incumbent.[13]

This is a key equation. The first term of one-half reflects the fact that ignoring policy preferences, any voter is equally likely to prefer the incumbent or the challenger. The second term measures the expected benefit of replacing the "lame duck" incumbent with a a challenger. The higher this term is, the lower the probability of re-election. If the incumbent is retained, the expected payoff in the following period is $u_0 + \beta\pi\Delta u$, but if replaced, the payoff is V. Generally, with forward-looking voters, $V > u_0 + \beta\pi\Delta u$, because if the incumbent is replaced by a new challenger, the latter faces electoral discipline, which benefits the voter.[14] Consequently, As we shall see, this creates a channel where changes in the trust parameter β and the information parameter σ affect V and thus the probability of re-election for *fixed* e, r.

Finally, the third term, is the change in the informed voter's posterior belief that the incumbent is good, conditional on observing e, r. So, the "reward" offered by the voter for high effort/low rent by the incumbent depends on both the quality of voter information, σ and the strength of voter preference for the public good, Δu. This is intuitive; a voter will reward the incumbent for effort only if she cares about effort, *and* she observes the outcome of the effort.[15] We call this the *performance bonus effect*.

Equilibrium

To complete the description of equilibrium, we need to consider the bad incumbent. If a bad incumbent is term-limited, he clearly sets zero effort $e_t = 0$ and extracts as much rent as possible i.e. sets $E_t = \tau_{j,t} = 0, T_t = \overline{T}$, implying $r_t = \overline{T}(1+\delta) \equiv \overline{r}$.

If a bad incumbent is non-term limited, he has only two undominated options. The first is to pool with the good type by setting $e_t = e^*, r_t = 0$, and the same fiscal policy as the good type. The second is to set zero effort $e_t = 0$, and take maximum rent $\overline{r}$, and accept the electoral consequences as described by (5). It is a standard exercise to characterise the conditions under which either of these two options is chosen. In fact, it turns out that there are a range of parameter values where the bad incumbent must randomise between the two options.

Generally, let λ be the probability that the bad incumbent pools; this measures the discipline effect of elections. Also, define $\equiv A = \frac{c(e^*)+\overline{r}}{\gamma\Delta u(R+\overline{r})}$. We then have the following

[13] Clearly, V is endogenous; an explicit formula for V is is presented and discussed below.

[14] In a two-period model, by contrast, both challenger and incumbent are "lame ducks" and so $V \equiv u_0 + \beta\pi\Delta u$, which closes down this channel.

[15] Note that γ measures the sensitivity of voting decisions to policy payoffs. We assume that γ is small enough so that $0 < p(e) < 1$.

characterisation of equilibrium, proved in the Appendix;

Proposition 1 *There exists an equilibrium where (i) if* $\sigma \leq A$*, only good incumbents choose* $e_t = e^*, r_t = 0$ *and bad incumbents choose* $e_t = 0, r_t = \overline{r}$*; (ii) if* $\sigma \geq \frac{A}{\beta\pi}$*, all incumbents choose* $e_t = e^*, r_t = 0$*; (ii) if* $A \leq \sigma \leq \frac{A}{\beta\pi}$*, the bad politician chooses* $e_t = e^*, r_t = 0$ *with probability*

$$\lambda = \frac{\beta\pi}{1-\beta\pi}\left(\frac{\sigma}{A} - 1\right), \tag{6}$$

and $e_t = 0, r_t = \overline{r}$ *otherwise; (iii) incumbents who set* $e_t = e, r_t = r$ *are re-elected with probability* $p(e, r)$*, as defined in (5). Consequently, electoral discipline* λ *is increasing in both trust* β*, and information* σ*, but it is always independent of* χ*.*

We can now note two points. First, we see that equilibrium behaviour of the bad incumbent, and therefore of voters, is *completely unaffected by the level of civic preferences,* χ. This is in stark contrast to Nannicini et al. (2013), even though on the fiscal policy side, and in the modelling of civic preferences, the model is *identical* to theirs. The reason, of course, is that relative to their paper, we have introduced asymmetric information about politician types, so that voting behaviour is determined by posterior beliefs of voters, rather than some ex ante voting rule.

Second, regarding the other two social capital measures, we see that there are three possible regimes. Across all regimes, both measures of social capital unambiguously improve electoral discipline. It is important to understand how two very different measures of social capital can have such similar effects. The intuition comes from the return to pooling conditional on λ, which from (5), and using Bayes' rule, can be written

$$\gamma\Delta u\sigma(\Pr(i = good\,|e^*, 0) - \Pr(i = good\,|0, \overline{r})) = \gamma\Delta u\sigma\frac{\beta\pi}{\beta\pi + (1-\beta\pi)\lambda} \tag{7}$$

This return is increasing in σ as expected, because effort is only rewarded at the ballot box if it is observed. It is also clear from (5) that for fixed λ, the return to effort is increasing in β. Ultimately, this is a mechanical property of the Bayesian updating formula. An intuition is that if the perceived prior probability of the incumbent is small (low β) then the absolute increase in the posterior must also be relatively small.

3.5 Empirical Predictions

Our main interest in the theory is to develop empirical predictions about performance of the incumbent over the two terms of office, the voting rule used by the voters, and the probability of retaining office at the end of the first term.

We begin with predictions about performance in the first period of office. As already observed, the model has been specified so that the theoretical equivalent of our empirical performance measure is the difference between g and T, i.e. e. Expected effort in the first period of office depends entirely on the discipline effect of elections. Specifically, this expected effort is:

$$e_1 = (\pi + (1-\pi)\lambda)e^* \tag{8}$$

Clearly, e_1 is increasing in λ and thus in both trust β and information σ. The intuition is straightforward; both trust and information increase discipline and thus performance. We can summarise as follows:

Proposition 2 *Expected performance in the first period of office is increasing in both trust and information.*

We now turn to look at the probability of retaining office for the incumbent, not conditional on performance. When we calculate this, we must do so using the *true probability that the incumbent is good* i.e. π, not the subjective probability $\beta\pi$. That is, p is the expected value of re-election from the point of view of an objective observer who knows the true probability that the incumbent is good.

Specifically, p is the expected value of $p(e, r)$ across both equilibrium effort and rent levels, $(e^*, 0)$ and $(0, \overline{r})$ and so is:

$$p \equiv (1-\pi)(1-\lambda)p(0,\overline{r}) + (\pi + (1-\pi)\lambda)p(e^*, 0) \tag{9}$$

where $(1-\pi)(1-\lambda), \pi + (1-\pi)\lambda$ are the objective probabilities that the incumbent pools or not.

To proceed, we can substitute out $p(e^*, 0), p(0, \overline{r})$ using (5). This gives

$$p = \frac{1}{2} - V - \gamma\left(u_0 + \beta\pi\Delta u\right) + \gamma\sigma\Delta u((\pi + (1-\pi)\lambda)Pr(i = good\,|e^*, 0) - \beta\pi) \tag{10}$$

The second term is again the lame duck effect. The third is the performance bonus effect averaged across both equilibrium effort and rent levels. In particular, with objective probability $\pi + (1-\pi)\lambda$, the incumbent will choose $e^*, 0$ and thus raise the posterior assessment of any informed voter from $\beta\pi$ to $Pr(i = good\,|e^*, 0)$.

The final step is to use the fact that V is simply the expected payoff generated by a new incumbent in his first term of office, which is the baseline payoff u_0, plus the probability

that the incumbent chooses high effort, $\pi + (1-\pi)\lambda$, times the utility increment from high effort i.e. $V = u_0 + (\pi + (1-\pi)\lambda)\Delta u$. Substituting this formula for V and the formula for $Pr(i = good\,|e^*, 0)$ into (10), we get

$$p = \frac{1}{2} - \underbrace{\gamma \Delta u\,(1-\beta\pi)\,\lambda}_{\text{lame duck}} + \underbrace{\gamma\sigma\Delta u\beta\pi\left(\frac{\pi + (1-\pi)\lambda}{\beta\pi + (1-\beta\pi)\lambda} - 1\right)}_{\text{average performance bonus}} \tag{11}$$

This shows p as a function of key parameters β, σ and of λ, which also depends on these parameters. The second term in (10) again measures the lame duck effect, which as already remarked, is always negative. The final term is again the performance bonus effect averaged out over both effort levels.

A key point is that this average performance bonus effect will only be non-zero if there is low trust i.e. $\beta < 1$, and the bad incumbent does not fully pool i.e. $\lambda < 1$, in which case it will be strictly positive and thus other things equal, turnover is lower with low trust through this channel.

The reason for this is the following. It is clear from (11) that when $\beta = 1$, the performance bonus effect disappears. Mathematically, this is just the well-known martingale property of Bayesian updating that the expected value of the posterior is equal to the prior. But, with low trust, voters have a relatively low prior belief that the incumbent is good, and thus "over-update" this belief, relative to an observer who has the correct belief, π. That is, the percentage increase in the posterior relative to the prior is greater than it is for an objective observer.[16] As a result, the performance bonus is too generous in the following sense; averaging across equilibrium performance levels, there will be a positive bonus, which reduces turnover.

It is then straightforward to combine (11) with the characterization of λ in Proposition 1 to prove the following:

Proposition 3 *If $\sigma \leq A$, p is strictly decreasing in trust β, and strictly increasing in σ, unless $\beta = 1$ in which case it is independent of σ. If $A \leq \sigma \leq \frac{A}{\beta\pi}$, then p is strictly decreasing in both β, σ. If $\sigma \geq \frac{A}{\beta\pi}$, p is strictly increasing in β, and independent of σ.*

[16] To see the point about over-updating in more detail, denote the posterior for any prior π' given observation of high effort as:

$$Pr(i = good\,|e^*, 0; \pi') = \frac{\pi'}{\pi' + (1-\pi')\lambda}$$

it is easily checked that if $\lambda < 1$, the posterior relative to the prior with and without low trust are:

$$\frac{Pr(i = good\,|e^*, 0; \beta\pi)}{\beta\pi} = \frac{1}{\beta\pi + (1-\beta\pi)\lambda} > \frac{1}{\pi + (1-\pi)\lambda} = \frac{Pr(i = g\,|e^*, 0; \pi)}{\pi}$$

So, we see that looking across all three regimes, that probability of re-election p is decreasing in trust, unless there is full pooling ($\lambda = 1$) in which case it is increasing. The intuition for this is as follows. From (11), β affects p through up to three differnt channels.

1. For fixed discipline $\lambda > 0$, β increases p because via a reduction in the lame duck effect. Intuitively, the higher is the expected quality of the incumbent, the less there is to be gained from replacing him with an incentivised challenger.

2. For fixed discipline $\lambda \in (0, 1)$, an increase in β has a negative effect on the performance bonus. In particular, if $\beta > \underline{\beta}$, where $\underline{\beta} < \frac{1}{2}$, it can be shown that the size of the performance bonus effect is decreasing in trust β, consistent with the fact that when $\beta = 1$, the performance bonus effect is zero.

3. p is decreasing in discipline λ via both the lame duck and performance bonus channels. So, as discipline in increasing in trust, an incresase in β reduces p via this channel.

In the case of full pooling, the performance bonus effect disappears, and so only the first channel is at work, giving the positive effect. When there is less than full pooling i.e. $\lambda < 1$, the discipline effect dominates the lame duck effect, and also the combination of the performance bonus effect and discipline effect on p is negative.[17]

Finally, with our analysis of p in hand, we can turn to ask how expected effort in the second period of office varies with trust. Second-period effort is entirely dependent on the selection effect of elections. Specifically, effort is e^* if the incumbent is good, conditional on winning the election, and zero otherwise:

$$e_2 = \Pr(i = good\,|\text{win})e^* \tag{12}$$

Here, $\Pr(i = good\,|\text{win})$ is the probability of being good conditional on winning; the size of this measures the selection effect. By Bayes' rule;

$$\Pr(i = good\,|\text{win}) = \frac{p(e^*, 0)\pi}{p} \tag{13}$$

where p is the unconditional true probability of winning given by (11). Using (9) or (11), we can establish conditions under which e_2 is increasing in trust and information. For example, if there is full pooling in equilibrium i.e. $\lambda = 1$, there there is no selection i.e. $Pr(i = good\,|\text{win}) = \pi$ and consequently, trust and information parameters β, σ have no effect on e_2.

[17] For low β, it is possible that the performance bonus effect is increasing in β; in this case, the discipline effect dominates.

On the other hand, if $\lambda > 0$, the picture is more complicated. First, both β, σ increase discipline, which, other things equal, *reduces* the selection effect as the bad incumbent is more likely to retain office. At the same time, effect of β, σ on $p, p(e^*, 0)$ via both the lame duck and performance channels come into play. We can however prove an unambiguous result for the effect of trust, which is the following.

Proposition 4 *If $\sigma \leq A$, second-term effort is strictly increasing in β, σ. If $A \leq \sigma \leq \frac{A}{\beta\pi}$, then second-term effort is strictly increasing in β, and also increasing in σ if $\gamma\Delta u > \frac{1-\pi}{2}$. If $\beta\sigma \geq \frac{A}{\pi}$, second-term effort is independent of β, σ.*

So, we see that second-term effort is always increasing in trust β. The intuition is as follows. When β increases, the dominant effect on both $p(e^*, 0), p$ is via increasing discipline λ, which reduces the quality of selection. However, this effect is stronger on p i.e. p decreases faster than $p(e^*, 0)$ does, so that the ratio $p(e^*, 0)/p$ increases. The effect of σ is however ambiguous.

4 The Institutional Setting

We test our theory using a dataset on Italian municipalities. Italy provides a good setting to test the predictions of our model for a number of reasons. First, there are striking cultural differences across Italian regions and provinces due to the lasting effects of centuries of foreign domination by different powers. These differences are part of everyday life and include the use of language and dialects, food, traditions and common habits. Second, there is evidence of a large variation in the performance of sub-national governments, as explained in more detail in Section 5.2 below.

Third, Italian municipalities, *comuni*, enjoy a relative high level of fiscal autonomy both in term of tax setting as well as in spending decisions; they are ruled by a city council (*consiglio comunale*) and a directly elected mayor (*sindaco*),[18] who appoints the members of the executive committee (*giunta comunale*), to which he or she delegates tasks. Municipal legislatures last for five years and mayors are subject to a two-term limit.[19] Municipal governments have power over land management and environment (water, sewage, public hygiene), local transport, local police, culture and recreation, education (nursery schools, training programmes) and also have discretionary powers on how much fiscal revenue to raise.

[18]Mayors are elected through a simple plurality rule in *small* municipalities (below 15,000 inhabitants) and through a runoff system in *large* municipalities (above the 15,000-inhabitants).

[19]From 2015 mayors of villages with fewer than 3,000 can serve up to three consecutive terms.

On average, over the period covered in our analysis, roughly 23% of total municipal revenues are generated by the property tax, this is most salient source of fiscal revenue, and each municipality can decide the tax rate within statutory limits sets centrally (see for example Bracco, Porcelli and Redoano, 2019b). Resident home-owners are generally exempted or face a lower tax rate than owners of second (rented or holiday) homes or businesses. Municipalities may also decide to apply a surtax on the personal income tax rate between 0 and 0.8% that generates roughly 8% of total municipal revenues. Fees on rubbish collections and other services, from transport to social care, and other taxes generate more than 43% of total revenues. Finally, intergovernmental grants produce the remaining 26% of municipal revenues.

5 Measuring Social Capital and Local Government Performance

5.1 Measuring Social Capital

Social capital, both in Italy and elsewhere, has been measured in two main ways (Guiso et al., 2008; Cartocci, 2007; Bracco et al., 2015; Nannicini et al., 2013). First, there are direct survey-based measures, which ask questions about social networks, trust, norms of reciprocity etc. Second, there are measures based on observable behaviours that are expressions of these networks and norms e.g. rates of blood donation, turnout in various elections and referenda, TV licence payments, membership of voluntary organisations, etc.

Our first measure of social capital, which we call our *standard measure*, is of the second kind, as there are simply no survey-based measures available at the municipal level for Italy, or indeed, as far as we are aware, for any other country. It is based on electoral turnout data and TV licence payment data, which are the only data available at the municipal level in Italy, described in more detail in Section 5.1.1 below, and on blood donations, which have been widely used in the literature and in the context of Italy (see for example (Nannicini et al., 2013)) but is only available at provincial level.[20]

Our standard measure has the drawback that it is potentially endogenous to the quality of local institutions, as social capital indicators are the outcome of strategic interactions between citizens and local institutions (Ashworth and de Mesquita, 2014). For example, it is possible that behaviours such as voter turnout, blood donation and TV licence payments depend in part the quality of local institutions, for example blood donation may be affected

[20]Similarly other data, such as newspaper readership, are only available at provincial level as well.

by the quality the healthcare as well as by the willingness of people to donate. As a result, voters in low social capital municipalities may behave and vote differently than voters in high social capital municipalities either because they have different individual characteristics (trust, information) or because they are responding to different institutional environments. For our purposes, it is important to distinguish these, because in the theory, social capital is defined by thetrust and information of *individual citizens*. To address this issue, we employ three strategies to measure social capital: our standard measure and two adjusted measures based on data from a bespoke survey (Sgroi et al. (2020)) and taking into account resident population's geographical origin.

5.1.1 A Standard Measure of Social Capital

We construct a standard social capital index as the first principal component from the only two social capital measures available in Italy at municipal level and blood donation, available at provincial level: (i) the share of households paying the TV licence in each municipality in 2013 and; (ii) turnout in the 2016 Italian referendum, (iii) share of population donating blood.

Anyone owning a TV set is required by law to purchase a TV licence. The cost of the license is set nationally, and is not trivial; in 2013 it amounted to €113.50 per year. The enforcement of the license payment is not rigorous, and so payment is an indication of pro-social behaviour. In 2013 sample year, about two thirds of households paid for a TV licence, while almost every household owned a TV set.

The second measure on which our index is based is the turnout to the 2016 referendum.[21] As referenda do not result in electing a government, voters' incentives to turn out are not distorted by patronage or individual benefit, and the turnout rate can be understood as a measure of citizens' pro-social behavior. In addition, being a constitutional referendum, unlike other referenda, there was no *quorum* imposed for the 2016 referendum to be valid, which eliminates another incentive for partisan voting.[22] Finally blood donation data have been regularly employed in the literature as a proxy for trust since there are neither legal nor economic incentives to donate blood, but the decision is driven only by social pressure and internal norms (see for example Guiso et al. (2004)).

[21] A constitutional referendum was held in Italy on Sunday 4 December 2016. Voters were asked whether they approved a constitutional law that amends the Italian Constitution to reform the composition and powers of the Parliament of Italy, as well as the division of powers between the State, the regions, and administrative entities.

[22] For example in the 2011 referendum, Berlusconi implicitly invited his supporters not to vote, in order not to reach the quorum of 50 percent. For this reason the 2011 referendum turnout results are highly correlated with left wing support and, therefore, cannot be used to construct the social capital index.

Table 2: Measures of social capital: Correlation at regional level

	2016 Ref.	EU elec.	Blood	News	1974 Ref.	Tv Lic.
2016 Referendum turnout	1					
European elections turnout	0.88	1				
Blood Donations	0.76	0.70	1			
Newspaper copies	0.69	0.67	0.54	1		
1974 Referendum turnout	0.96	0.94	0.75	0.76	1	
TV licence	0.59	0.44	0.58	0.33	0.59	1

Notes: data aggregated at regional level. Original data available at municipal level for 2011 and 2016 referenda and TV licence, provincial level otherwise. Sources: referenda turnout from Interior Ministry; TV Licence from RAI TV Subscription office; Blood donation and newspaper readership from Nannicini et al. (2013).

Table 2 below displays regional-level correlation measures between some of main indicators of social capital that have been employed for Italy and the three measures we use in this paper. As expected all our measures are highly correlated with each other.

5.1.2 Adjusted Measures of Social Capital

In order to construct alternative measures of social capital, which are plausibly exogenous to the quality of local governments, we employ data collected from an original online survey that includes various experimental features. The survey was conducted in April 2019 in three of Italy's largest cities: Rome, Milan and Turin.[23] In the survey, we interviewed approximately 500 residents in each of the three cities and collected detailed information on their geographical origin as well as the geographical origin of their parents and grandparents. More information on the design of the survey and the results of the analysis are in Sgroi et al. (2020).[24]

Selecting respondents sharing a common place of residence but with diverse origins allows us to separate the effect of culture (as exogenous social capital) which we can derive from their background, from the economic and institutional environment in their place of residence. A similar "epidemiological" approach has been employed in the literature on culture and economics, and has been used to study a variety of issues, including female labour

[23]The three cities were chosen for their size and also because of their reputation for drawing internal migrants from across Italy. Subjects were recruited through the Qualtrics Italian panel of subjects and selected to ensure a demographic spread that eliminates bias and resembles the wider population. The experiment was registered in advance in the AEA RCT Registry (see Bracco et al. (2019a)).

[24]Demographic information about the survey respondents including a breakdown by city of residence are provided in table S1 in the appendix to Sgroi et al. (2020).

force participation, fertility, labor market regulation, redistribution, growth, and financial development (see Fernández and Fogli (2009) and Fernández (2007)) but as far as we are aware, not in the context of public finance and political economy.

A key result from Sgroi et al. (2020) is that individuals' cultural identity remains strongly connected to the cultural traits of the place of origin of their relatives, in particular their mother (and maternal grandmother), irrespective of their place of residence. For example, one finding is that an individual who lives in Milan and whose mother is from Sicily contributes less on average in a public good game than to another individual who lives in Milan but whose forebears are from the north of Italy.

Using the survey results and internal migration patterns, we can isolate the cultural component of social capital from the institutional component. More formally, we define an *adjusted* index of social capital for province p in region r as follows:

$$SC^p = n^p_{p,r} SC_p + n^p_{-p,r} SC_r + n^p_{-r} \overline{SC}^r_{-r}, \quad \text{where} \quad \overline{SC}^r_{-r} = \frac{\sum_{j \neq r} N^r_j \tilde{SC}_j}{\sum_{j \neq r} N^r_j} \tag{14}$$

Here p refers either to one of the the 110 provinces or one of the 25 largest cities in Italy; from now on, for convenience, we refer to such an entity as a province.[25] Then, n^p_{pr} is the share of residents born in province p, $n^p_{-p,r}$ is the share of residents born in region r but in provinces other than p, and n^p_{-r} is the share of residents born in regions other than r. These shares are reported in Table N.1 in the Online Appendix for each of the 110 provinces and for the country's 25 largest cities in 2011. Finally, N^r_j is the stock of migrants living in region r who are originally from region j. Table N.2 in the Online Appendix reports these region-by-region migration stocks N^r_j, collected in the same year.

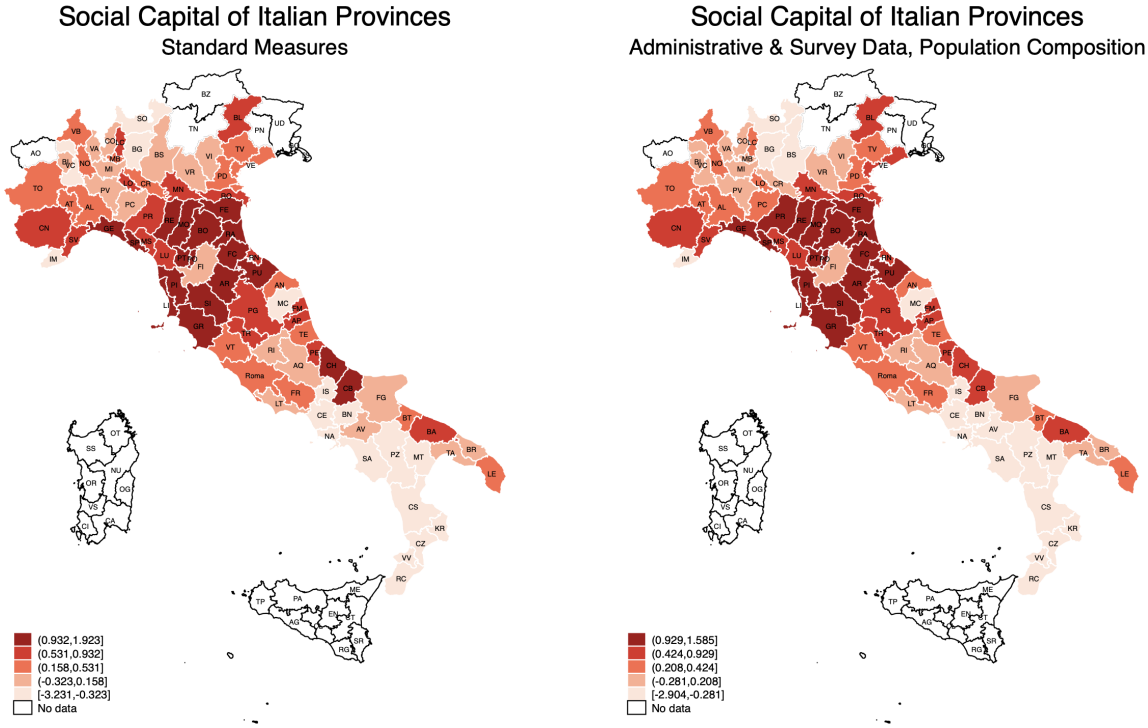
As for the "SC" variables, SC_p, SC_r are the standard levels of social capital at the province and region level respectively. Also, $\tilde{SC}_j$ is a measure of social capital in region j taken from our bespoke survey. It is the survey equivalent of the standard index; that is, it is based on the first principal component of responses to questions on blood donation, TV licence payments and turnout at referenda, aggregated at the level of the region of the respondents' mothers. Specifically, we use the survey responses to the questions "Do you donate blood?","Do you pay the TV licence?","Do you usually vote at referenda?" and we average the responses by the region of respondents' mothers (Sgroi et al. (2020)).

Given all these variable definitions, the interpretation of (14) is the following. The adjusted indicator of social capital allocates a different level of social capital to each of three shares of the local provincial population. Those born in the province of residence are assumed

[25] The cities are Torino, Genova, Milano, Brescia, Verona, Venezia, Padova, Trieste, Parma, Reggio-Emilia, Modena, Bologna, Ravenna, Firenze, Livorno, Prato, Perugia, Roma, Napoli, Bari, Taranto, Reggio Calabria, Palermo, Messina and Catania.

to be the individuals with the strongest ties to the locality, and are therefore allocated the standard level of social capital of that province. Those born in a province different from that of residence, yet within the same region, are allocated the level of social capital of the region, excluding the province. This construction reflects the fact that we do not have data on the exact province of origin of inward migrants from within the region. Finally, those born in a different region are given a level of social capital $\overline{SC}^{r}_{-r}$, which is the weighted average of the survey-based social capital indices across all other regions (excluding their own region of residence), with the weights being the bilateral stock of immigrants from each of these other regions. So, effectively, the third term assigns to the share of the province's population that from outside the region, the social capital of the region of origin of the mother of the resident.

Figure 1: Social Capital, Standard and Adjusted Indexes (by Mother's Region of Birth)



Notes: Provinces are colored according to their level of standard and adjusted social capital, expressed in term of quintiles. Darker colours indicate higher level of social capital. Special autonomy regions (Valle d'Aosta, Trentino-Alto Adige, Friuli-Venezia Giulia, Sicily and Sardinia) have been excluded in the computation of social capital.

The map on the left of Figure 1 provides a graphical illustration of the distribution of social capital aggregated at the provincial level using the standard measure of social capital described in Section 5.1.1; the map on the right of Figure 1 shows the distribution of social capital for the adjusted social capital index. The two maps look similar since they differ

only in the third component, however we note a dilution of social capital in those areas with high levels of internal immigration.

5.2 Local Government Performance

Since 2011 the Italian government has been conducting a comprehensive analysis of expenditures and output of municipalities, in oder to calculate so-called "Standard Expenditure Needs" of municipalities to inform the design of the grant system. Information provided by official sources (balance sheets, National Institute of Statistics, Ministry of Education, Land Registry Office, etc.) was integrated with new data from ad-hoc questionnaires to local authorities on each service provided by municipalities, enquiring about outputs, inputs, methods of management and organisational decisions. From this data, a simple system of performance indices was created, providing basic information on how each municipality uses its resources for the provision of the essential services.

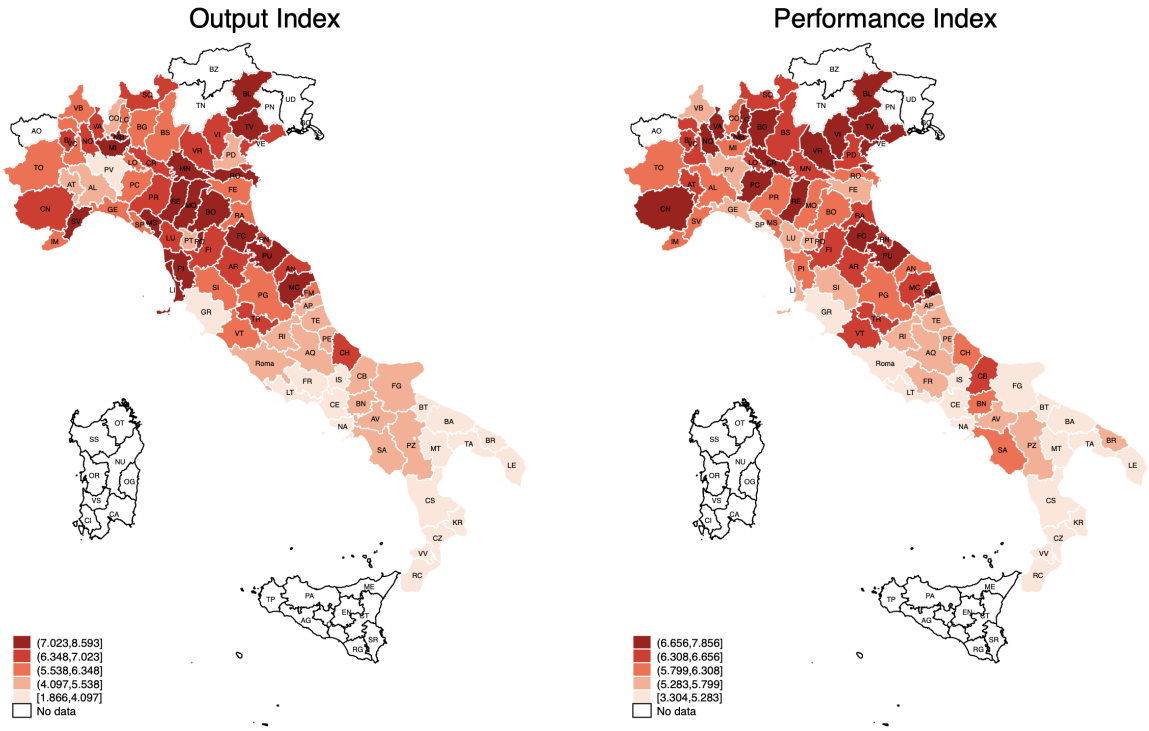
This paper uses two indexes from this exercise. First, we use an output gap indicator scaled between 1 (worst) and 10 (best) based on the difference between the actual level of services provided by a municipality and the standard level of services.[26] Second, we use the performance indicator, which is the difference between the output indicator and an expenditure gap indicator. The latter is based on the difference between actual and standard expenditures and scaled between 1 and 10, with a lower score for higher levels of the expenditure gap. By construction, the performance index is higher for a municipality that can provide a given level of output at lower expenditure i.e. that is more efficient (see Porcelli et al., 2016, for details).

The first set of performance indices use 2010 data collected by the Ministry of Finance in 2011 and 2012. There have been subsequently three further waves using data from 2013, 2015 and 2016 (collected by the Italian Ministry of Finance respectively in 2016, 2017 and 2018). The computation of each wave of this index has been done to allow cross-wave comparisons.[27] Since 2015, these data have been published online on the website Opencivitas (www.opencivitas.it).

[26]The standard level of services corresponds to the simple average of the level of services provided by municipalities in the same population bracket (local authorities have been divided into ten population brackets from those below 500 inhabitants to those above 100,000 inhabitants). The historical level of services is a composite indicator of the outputs produced in the essential municipal functions: number of users of the social care service, number of users of the ancillary education services, number of fines and controls carried out by local police officers, tons of urban waste recycled, number of authorisations and inspections for planning activities in the environmental and land management sector. Weights correspond to the level of expenditure employed in each service.

[27]We use the 2010 index for years between 2008 and 2011; the average between the 2010 and 2013 index for year 2012; the 2013 index for year 2013; the average between 2013 and 2015 index for year 2014; the

Figure 2: Municipal Output and Performance index: Quintiles of Averages at the Province Level



Notes: Provinces are colored according to their level of the output and performance indices, expressed in term of quintiles. Darker colours indicate a higher level of the index. Data for Special autonomy regions (Valle d'Aosta, Trentino-Alto Adige, Friuli-Venezia Giulia, Sicily and Sardinia) are not available since standard expenditure needs are computed only for municipalities in normal regions.

To illustrate, we show in Figure 2 the average province-level values of the output and efficiency indices obtained for 2016. From these we can observe an obvious North-South gradient, but there is also variability within broad regions.

6 Empirical Results

6.1 Data Description and Variable Definitions

Two main testable predictions emerge from the theory. The first is that municipal performance and output depend on two key factors, the degree of social capital and the presence of electoral incentives, i.e. the possibility for the incumbent mayor to run in the next election (Propositions 2, 4). The second one is that for a wide range of parameter values, the

2015 index for year 2015; the 2016 index for all subsequent years.

probability of incumbent re-election is negatively affected by the level of social capital in that municipality (Proposition 3).

We test these predictions using a panel for over 6700 municipalities (85% of Italian municipalities, since municipalities in special-autonomy regions have been excluded) for the period 2010–2016, the period for which the performance and output indices are available. We measure our first outcome variables, municipal performance and output, using the Open-civitas performance and output indexes described in the previous Section.[28] We measure our second outcome variable, the probability of incumbent re-election, as a dummy variable that takes value one if the incumbent mayor is re-elected, and zero otherwise.

Our key explanatory variable for our testable predictions is a measure of the level of social capital, SC, in that municipality. In our baseline regressions we will employ the standard social capital index discussed in Section 5.1.1; due to endogeneity concerns, we will also instrument it with the adjusted social capital index developed in Section 5.1.2. Note that to ease the interpretation and the comparison of the results all social capital indices have been standardised to have mean zero and standard deviation of one.

To control for the main characteristics of *comuni* we also use municipal financial, census, and election data. In particular, we have the following *municipal controls*: per capita property tax burden, per capita grants from upper-tier governments, average per capita taxable income, population, proportion of children (less than 14 years old) and elderly (over 65 years old), and regional indicator variables. These variables are collected from the Statistical Atlas of Municipalities, yearly issued by the Italian National Statistical Institute (ISTAT) and the Ministry of Economy and Finance (MoF) and all monetary values are deflated using ISTAT 2001 monetary revaluation index.

We also employ *political controls*. First, to take into account a mayor's political preferences, we construct three indicator variables, *Left*,*Right*, *Independent* dummies, each taking the value of one if the mayor is supported by a left-wing coalition, right-wing coalition or she is an independent respectively, and zero otherwise. As performance may be affected by the electoral cycle, we include a control variable, *electoral cycle*, calculated as the number of years since the previous election. We also include a term limit dummy, TL, which takes a value of one when the mayor cannot run for re-election because of the term limit, which is two terms for municipalities with more than 3,000 inhabitants and three for municipalities with less than 3,000 inhabitants. We also account for the fact that electoral rules are simpler for small municipalities (first past the post for municipality with less than 15,000 inhabitants) by using a dummy *SmallMunicipality* for these cases. In selected specifications

[28]Note that the social capital indexes are not time-varying, but the performance and output indexes are time-varying and intermediate years are interpolated.

we also include the *Lagged Margin of Victory* variable which is the difference in vote share between the winner and the runner-up in the previous elections.

Our last set of controls are related to *mayor characteristics*: age (linear and quadratic), gender, education, and the mayor's previous occupations, via four dummy variables: low skilled and not relevant to the current position, low skilled and relevant, high skilled and not relevant and high skilled and relevant.[29] These should help to control for the selection effect. In Table 4 we report the summary statistics for all our variables.

6.2 Social Capital and Municipal Performance

We start by testing the predictions of Propositions 2, 4. These are: first, that that municipal performance in the first term of office unambiguously increases with social capital as measured by trust or information, second, that performance of term-limited mayors also unambiguously increases with social capital as measured by trust, and third, that for some parameter values, term-limited performance also increases with social capital as measured by information. We estimate the following equation:

$$Perf_{it} = \alpha(SC_i \times (1 - TL_{it})) + \beta(SC_i \times TL_{it}) + \gamma TL_{it} + \delta' X_{it} + \phi' Z_{it} + u_{it} \tag{15}$$

The dependent variable is municipal performance ($Perf$), measured by the Opencivitas performance (1-10) score, and the regressors of interest are the social capital indicators (SC) and the term-limit dummy (TL).

The main coefficients of interest are α and β ; the theory predicts that $\alpha, \beta > 0$. Moreover, $\alpha > \beta$ would indicate that the positive effect of social capital on discipline is stronger than the effect on selection and *vice versa*. However, the theory does not make any predictions about the sign of relative sizes of α, β, only that they are both positive.

Throughout, we also use a common set of municipal controls X_{it}, as described in 6.1. Moreover, Z_{it} are a set of additional regressors relating to the political characteristics of the municipality and the personal characteristics of the mayor. Finally we also allow for regional and year fixed effects and their interaction throughout. We include the interactions between years and regional dummies to control for the effect on performance of those unobservable factors, such as bilateral immigration flows, affecting regions differently in a given year. Standard errors are clustered at the municipal level.

[29] To give an example, a mayor previously working as lawyer or pubic manager would be classified as high skilled/high relevant, on the contrary an unskilled manual worker would be classified as high skilled/low relevant.

The results are reported in Table 5. In the first column we regress the Opencivitas index of municipal performance on the standard social capital index and the municipal controls (X). In the second column we estimate separate coefficients for term limited and non-term limited municipalities. In the third column we augment the specification of column 2 with the full set of controls (the vector Z).

However as discussed in Section 5.1, traditional measures of social capital may be endogenous because they are the outcomes of the interactions between individuals and local institutions. To address this concern, we instrument the standard social capital index in two ways. First, in column 5, we instrument the standard social capital index and its interaction with TL by the adjusted social capital index introduced in Section 5.1.2 and its interaction with TL respectively.

Second, as discussed in section 5.1, $\tilde{SC}_j$ is constructed from answers of respondents to questions about the payment of the TV license, voting in *referenda* and blood donation and these may be subject to measurement error because of e.g. unwillingness to admit to anti-social behaviour, etc. To address this concern, we replace $\tilde{SC}_j$ with SC_j in $\overline{SC}^r_{-r}$. This addresses the measurement problem in that SC_j are calculated from administrative data on the payment of TV licenses, 2016 referendum turnout and blood donation. We will call this measure the *population adjusted* index. Then, in column 6, we instrument the standard social capital index and its interaction with TL by the population adjusted index and its interaction.

From the inspection of Table 5 we can clearly see that the effect of social capital on performance is always positive and strongly significant in all our specifications both for term limited and non-termlimited municipalities. However $\hat{\alpha}$ is significantly larger than $\hat{\beta}$ in all specifications , indicating that the effect of incentive is bigger than the effect of selection. The estimated α coefficients in columns 2 and 3 are in the range of 0.41-0.42, both without and with controls. From these estimates, we can compute that a one standard deviation increase in social capital raises the performance of non-term-limited mayors on average by about 7 percent; also, moving from the lowest to the median level of social capital increases performance by about 38 percent. The interaction between the TL and SC is negative and significant in all columns.

If the mayor is term limited, instead, the positive effect of a one standard deviation increase in social capital on performance is about 5.6 percent. Similarly, moving from the municipality with the lowest social capital to the one with the the median level increases performance by about 30 percent.

The results when SC and its interactions with TL and $1 - TL$ a are instrumented are reported in columns 4 and 5. The F test statistics for the first stage regressions are very

large, as expected. We also report the Durbin-Wu-Hausman endogeneity test; under the null hypothesis that the endogenous regressors can actually be treated as exogenous, the test statistic is distributed as chi-squared. We can clearly reject the hypothesis that the standard measure of SC is exogenous.

In columns 4 and 5, coefficients on SCs are approximately 60 percent larger than in the OLS specification. The results suggest that an increase in one standard deviation in the the social capital indicator increases municipal performance of 9 percent if the local government is term-limited and of 11 percent if the mayor can run again.

Turning to the effect of the other controls, the fact that a municipality has high income *per capita* and receives a high intergovernmental grant is associated with low performance, a possible reason being that the availability of financial resources creates a perverse disincentive to spend resources efficiently. This result also indicates that social capital is capturing something else beyond availability of resources. As for the political variables, column 3 indicates that municipalities ruled by traditional coalitions, rather than civic lists, are associated with higher performance, however the results are significant only for left wing municipalities. $Small$, the dummy for the municipalities with population less that 3000, which have a three-term limit, is negative but only significant in the the first column. The $First\ past\ the\ post$ dummy, identifying the change in electoral system at the 15,000 inhabitant threshold, is consistently negative and significant. Regarding mayors' characteristics, we control for education, i.e. whether or not they have an university degree, gender, age (linear and quadratic), and the mayor's previous occupation. The only personal characteristic which seems to play a significant role in affecting performance is gender. Female mayors are associated with higher performance; a female mayor's performance is about 2 percent higher than that of a male counterpart.

As a further exercise, we re-estimate model (15) replacing the Opencivitas performance index with the output index. The results for this exercise are in Table 6; the format of the table is the same as in Table 5. We see that as in the case of performance, the level of social capital has a positive effect on output, significant at the 1% level. Columns 2 and 3 of Table 6 have a coefficient on SC for municipalities with non-termlimited mayors of about 0.69, both with and without controls and for termlimited ones of about 0.60. However when SC is instrumented, the size of this coefficient almost double and is still significant at 1%, for both set of municipalities.

Finally, as a robustness check we re-estimate model (15) using two different sub-samples. Results for this exercise are reported in Tables N.3 and N.4 in the Appendix. First, given that the survey employed to construct the adjusted social capital was conducted in Milan, Rome and Turin, we exclude data from these three municipalities to estimate model (15),

Table 3: Distribution of Elections by year, Social Capital and Geographical Location.

Year	N.Elections	Share High SC	North	Centre	South
2007	756	0.43	0.41	0.13	0.47
2008	393	0.46	0.36	0.16	0.48
2009	3999	0.49	0.69	0.15	0.16
2010	437	0.54	0.34	0.08	0.57
2011	1152	0.54	0.47	0.15	0.38
2012	708	0.45	0.43	0.14	0.43
2013	520	0.50	0.43	0.14	0.43
2014	3819	0.49	0.69	0.15	0.16
2015	508	0.41	0.34	0.10	0.55
2016	1,162	0.45	0.48	0.15	0.36

Note:a municipality is defined as HSC if its level of standard social capital is above the median level.

columns 1-3. Second, since data on internal migration are based on 2011 Census, exclude data from earlier years, columns 4-6. The set of controls is the same as in the previous regressions. Overall the results confirm the findings reported in Tables 5 and 6.

6.3 Social Capital and the Incumbent Re-Election Probability

Proposition 2 above predicts that unconditional on performance, high social capital in the form of trust is associated with a lower re-election probability as long as the bad incumbent does not fully pool. Also, with full trust ($\beta = 1$), high social capital in the form of information implies a lower re-election probability. We can test these hypotheses, as as all municipalities had at least one election during our sample period. Information on the distribution of elections across geographical areas and by social capital for any given year is provided in Table 3. This Table shows that the share of high social capital municipalities holding elections does not differ much by year.

We estimate the following equation:

$$RE_{i,e} = \alpha SC_i + \beta' X_{i,e} + \delta' Z_{i,e} + u_{i,e} \tag{16}$$

where e is an election year (specific to each municipality), and $RE_{i,e}$ is a dummy taking value of one if the incumbent is re-elected in that year in municipality i and zero otherwise. The key coefficient in (16) is α: from Proposition 2, we expect this to be negative.

We propose two alternatives for this exercise. In the first one, RE is defined at the *candidate* level; $RE = 1$ if the incumbent mayor is re-elected at the next election and zero

otherwise. We consider the set of elections where the incumbent could run in the following period i.e. she was not term limited and less than 70 years old (columns 1 to 5 of Table 7).

The second alternative, reported in column 6 of Table 7, is where RE is defined at the *coalition* level i.e. where $RE = 1$ if a candidate from the incumbent party coalition is re-elected and zero otherwise. In this case, we use the full set of elections. This specification takes into account a typical feature of the Italian municipal system, where it is often the deputy mayor, or a member of the local government from the same party, that runs for the post if the mayor is term limited. We estimate a linear probability model, and standard errors are clustered at provincial level.[30]

As controls we employ the basic set of municipal controls (X) and also the the set of political controls and incumbent characteristics (Z). In addition, to take into account the extent of electoral competition in each municipality, we also include the incumbent margin of victory (i.e. the difference in the vote share between the winner and the runner up) at the previous election. Regional and year fixed effects are included in all regressions.

The results are given in Table 7 below. Specifications 1-3 are estimated using the standard measure of social capital, and in specifications 4 to 6, SC is instrumented by the adjusted or the population adjusted social capital index as in Tables 5 and 6. The results show a negative effect of social capital on the incumbent re-election probability that is robust across all specifications. The magnitude of the estimated α is in the order of -0.02 both when estimated without controls or with full set of controls and instrumented. In the specification of column 4, a one standard deviation increase in social capital is associated with a 4 percent decrease in the probability of incumbent re-election. Moving from the lowest level of social capital to the median level decreases the probability of being re-elected for the incumbent mayor by 20 percent. Overall, these results are as predicted by the the theory.

Regarding the other controls, we observe the following. The first past the post system, in place for municipalities with population under 15,000 residents, is associated with a decrease in the likelihood to of re-election. The party of the incumbent does seem to play a role in affecting re-election; there is a positive effect of traditional left or right coalitions compared to civic list or populist parties. The previous occupation of the mayor does (marginally) matter for high skilled and experienced mayors but age does not. Being a female incumbent is negatively associated with re-election, despite the fact that, according to Table 5, women perform generally better than men. In column 6 we use the party-based definition of incumbent with very similar results but larger in magnitude; here an increase of one standard deviation of social capital is associated with a reduction of 7.3 percent in the probability of re-election.

[30]Probit regressions produce very similar results and are available upon request.

7 Conclusion

This paper has made three contributions. First, we have presented a theoretical analysis of how *both* the civic preference and information aspects of social capital impact on government performance and turnover, employing a political agency model with both moral hazard and adverse selection. Second, we have presented novel measures of both local government performance and on social capital at the Italian municipality level, using administrative data and an online survey respectively. Third, our empirical results have shown that higher social capital improves government performance, especially in the first term of office, but also increases turnover of incumbent mayors, as predicted by the theory. The voting rule predicted by the theory has the feature that the level effect of social capital on the incumbent vote share is negative, but the interaction between social capital and performance is positive, and we have found empirical support for this. Our paper is one of the first, we believe, to show a link between social capital and the technical efficiency of government. It is also the first to show that unconditionally, social capital is linked to higher turnover.

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Table 4: SUMMARY STATISTICS

Variables	Mean	Std. Dev.	N
Opencivitas Performance Index	5.893	1.886	49618
Opencivitas Output Index	5.485	2.759	49618
Social Capital (standardized)	0.00	1	49618
Social Capital ((standardized and adjusted for mother's PoB)	0.00	1	42659
Municipal Characteristics			
Population	7.724	45.438	49618
Share children	0.129	0.027	49618
Share elderly	0.224	0.058	49618
Income (thousand of Euros pc, deflated)	14.110	3.018	49618
Grants, per capita (deflated)	160.668	237.966	49618
Property tax, per capita (deflated)	132.985	156.3741	49618
Municipal Political Variables			
Relection (person) (dummy)	0.539	0.498	34181
Relection (party) (dummy)	0.688	0.462	29690
Term limit (dummy)	0.376	0.484	49142
Small Municipality (population < 3k, dummy)	0.550	0.497	49618
Municipal Majority Coalition: Left-wing (dummy)	0.097	0.297	49142
Municipal Majority Coalition: Right-wing (dummy)	0.092	0.289	49142
Margin of Victory (MV)	21.637	18.522	43497
First past the post (population < 15k inhabs, dummy)	0.096	0.294	49618
Electoral Cycle	1.943	1.331	49142
Mayor Characteristics			
Incumbent: Female (dummy)	0.117	0.321	49618
Incumbent: Age	50.256	10.364	49142
Incumbent: College degree (dummy)	0.453	0.497	44587
Incumbent: High school Graduate (dummy)	0.449	0.497	42647
Job Skill/relevance: low:low (dummy)	0.194	0.396	42119
Job Skill/relevance: low:high (dummy)	0.037	0.188	42119
Job Skill/relevance: high:low (dummy)	0.317	0.465	42119
Job Skill/relevance: high:high (dummy)	0.341	0.474	42119

Notes: Performance index and output index are collected from the website Opencivitas.it; Social capital measures are collected from multiple sources (Ministry of Interior, the Italian national public broadcasting, and authors' survey); Municipal Characteristics are provided by the Italian National Institute of Statistics and the Ministry of Economy and Finance; Municipal Political variables and Mayors Characteristics are collected from the official electoral archives of the Ministry of the Interior. The margin of Victory is computed considering the last round of the election. The electoral cycle counts the number of years from the ballot. High job skill identifies mayors whose occupation requires a university degree; instead, high relevance identifies mayors whose profession is related to public administration independently on the specialization. Deflated refers to base year 2001.

Table 5: MUNICIPAL PERFORMANCE EQUATION

Dependent variable: Municipal Performance	(1)	(2)	(3)	(4)	(5)
SC	0.4113***				
	[0.033]				
SC x No Term Limit		0.4293***	0.4160***	0.6918***	0.6837***
		[0.018]	[0.019]	[0.029]	[0.029]
SC x Term Limit		0.3499***	0.3422***	0.5567***	0.5449***
		[0.024]	[0.025]	[0.037]	[0.037]
Term limit		-0.0729***	-0.0651**	-0.0809***	-0.0812***
		[0.028]	[0.030]	[0.030]	[0.030]
Income	-0.0641***	-0.0663***	-0.0694***	-0.0795***	-0.0791***
	[0.009]	[0.005]	[0.005]	[0.005]	[0.005]
Grants	-0.0008***	-0.0008***	-0.0007***	-0.0008***	-0.0008***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Majority Coalition Left			0.1327***	0.1135***	0.1142***
			[0.034]	[0.034]	[0.034]
Majority Coalition Right			0.0358	0.0306	0.0305
			[0.029]	[0.029]	[0.029]
Small			-0.0457*	0.0104	0.0091
			[0.024]	[0.024]	[0.024]
First past the post			-0.1242***	-0.0789**	-0.0801**
			[0.034]	[0.034]	[0.034]
Incumbent Female			0.1155***	0.1015***	0.1017***
			[0.025]	[0.025]	[0.025]
Incumbent Age			0.0155**	0.0133*	0.0134*
			[0.008]	[0.008]	[0.008]
Incumbent Degree			0.0446	0.0227	0.0232
			[0.034]	[0.034]	[0.034]
Incumbent Skills & Experience			-0.0144	-0.0042	-0.0044
			[0.025]	[0.026]	[0.026]
Z controls	NO	NO	YES	YES	YES
Method	OLS	OLS	OLS	IV	IV
Instruments				Adj.	Pop. Adj.
First Stage F-statistics for SC				981.93	1009.84
p-values				[0.00]	[0.00]
First Stage F-statistics for SC X Term Limit				285.27	294.03
p-values				[0.00]	[0.00]
Durbin-Wu-Hausman test				138.80	132.03
p-values				[0.00]	[0.00]
$\alpha = \beta$ test (p-values)		[0.00]	[0.00]	[0.00]	[0.00]
Observations	42,623	42,220	37,944	37,344	37,344
R-squared	0.240	0.241	0.241	0.240	0.240

Notes: standard errors clustered at municipal level in brackets, * = $p < 0.1$, **= $p < 0.05$, *** = $p < 0.01$. Dependent variable is the Opencivitas Performance Indicators. Regional dummies, year dummies, Regional dummies × year dummies, and municipal controls (X) are included in all regressions. X includes *per capita municipal* income, *per capita municipal* grants from upper levels of governments, population, share of population above 65 years old and below 15 years old. Social capital is the standardized standard social capital index, in columns 5 and 6 social capital is instrumented with the adjusted and population adjusted social capital index. Z controls include: plurality rule elections for municipalities with less than 15,000 inhabitants, no term limit dummy for municipalities with less than 3,000 inhabitants, majority coalition Right (Left) coalition dummies, mayor's age and aged squared, gender, education (university or high school degree), occupation prior to mandate (high skill/low skill and experience relevant/non relevant to mandate).

Table 6: MUNICIPAL OUTPUT EQUATION

Dependent Variable: Output	(1)	(2)	(3)	(4)	(5)
SC	0.6743***				
	[0.045]				
SC x No Term Limit		0.6938***	0.6885***	1.3147***	1.3478***
		[0.025]	[0.026]	[0.042]	[0.043]
SC x Term Limit		0.6000***	0.6068***	1.0351***	1.0610***
		[0.033]	[0.035]	[0.051]	[0.051]
Term limit		0.0017	-0.0284	-0.0764*	-0.0754*
		[0.042]	[0.045]	[0.045]	[0.045]
Income	0.0924***	0.0909***	0.0903***	0.0641***	0.0656***
	[0.013]	[0.007]	[0.008]	[0.008]	[0.008]
Grants	0.0005***	0.0005***	0.0005***	0.0009***	0.0009***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Majority Coalition Left			0.4467***	0.3913***	0.3944***
			[0.050]	[0.050]	[0.050]
Majority Coalition Right			0.1842***	0.1694***	0.1700***
			[0.044]	[0.044]	[0.044]
Small			0.0315	0.1446***	0.1393***
			[0.035]	[0.035]	[0.035]
First past the post			-0.2915***	-0.1949***	-0.1999***
			[0.049]	[0.050]	[0.050]
Incumbent Female			0.1587***	0.1282***	0.1287***
			[0.038]	[0.038]	[0.038]
Incumbent Age			-0.0075	-0.0095	-0.0093
			[0.011]	[0.011]	[0.011]
Incumbent Degree			0.0777	0.0334	0.0353
			[0.050]	[0.052]	[0.051]
Incumbent Highly			-0.0174	0.0053	0.0046
Skilled & Experienced			[0.037]	[0.038]	[0.038]
Z controls	NO	NO	YES	YES	YES
Method	OLS	OLS	OLS	IV	IV
Instruments				Adj.	Pop. Adj.
First Stage F-statistics for SC				981.93	1009.84
p-values				[0.00]	[0.00]
First Stage F-statistics for SC X Term Limit				285.27	294.03
p-values				[0.00]	[0.00]
Durbin-Wu-Hausman test				138.80	132.03
p-values				[0.00]	[0.00]
$\alpha = \beta$ test (p-values)		[0.00]	[0.00]	[0.00]	[0.00]
Observations	42,623	42,220	37,944	37,344	37,344
R-squared	0.240	0.241	0.241	0.240	0.240

Notes: standard errors clustered at municipal level in brackets, * = $p < 0.1$, **= $p < 0.05$, *** = $p < 0.01$. Dependent variable is the Opencivitas Performance Indicators. Regional dummies, year dummies, Regional dummies × year dummies, and municipal controls (X) are included in all regressions. X includes *per capita municipal* income, *per capita municipal* grants from upper levels of governments, population, share of population above 65 years old and below 15 years old. Social capital is the standardized standard social capital index, in columns 5 and 6 social capital is instrumented with the adjusted and population adjusted social capital index. Z controls include: plurality rule elections for municipalities with less than 15,000 inhabitants, no term limit dummy for municipalities with less than 3,000 inhabitants, majority coalition Right (Left) coalition dummies, mayor's age and aged squared, gender, education (university or high school degree), occupation prior to mandate (high skill/low skill and experience relevant/non relevant to mandate).

Table 7: RE-ELECTION EQUATION

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
Incumbent Reelection	Person	Person	Person	Person	Person	Coalition
SC	-0.0219***	-0.0237**	-0.0192**	-0.0210*	-0.0207*	-0.0520***
	[0.009]	[0.010]	[0.009]	[0.013]	[0.013]	[0.013]
Margin of victory past el.		-0.0006***	-0.0006***	-0.0006***	-0.0006***	0.0040***
		[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
	[0.133]	[0.144]	[0.135]	[0.154]	[0.154]	[0.173]
Income	-0.0079***	-0.0100***	-0.0045***	-0.0040**	-0.0040**	0.0044
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.004]
Grants	-0.0000*	-0.0000	-0.0001***	-0.0001***	-0.0001***	-0.0000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Property Tax	0.0001	0.0000	0.0000	0.0000	0.0000	-0.0001**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
First past the post			-0.0488***	-0.0435***	-0.0435***	-0.1810***
			[0.013]	[0.013]	[0.013]	[0.018]
No term limit			0.1488***	0.1509***	0.1509***	0.0607***
			[0.011]	[0.011]	[0.011]	[0.015]
Majority Coalition Right			0.0997***	0.0972***	0.0972***	0.0931***
			[0.019]	[0.017]	[0.017]	[0.023]
Majority Coalition Left			0.0579***	0.0542***	0.0541***	0.2414***
			[0.014]	[0.015]	[0.015]	[0.018]
Incumbent Female			-0.0399***	-0.0401***	-0.0401***	-0.0232
			[0.013]	[0.013]	[0.013]	[0.016]
Incumbent Age			0.0048	0.0055	0.0055	0.0135***
			[0.005]	[0.004]	[0.004]	[0.005]
Incumbent Degree			-0.0125	-0.0112	-0.0112	-0.0445***
			[0.009]	[0.008]	[0.008]	[0.012]
Job Skill/relevance: low:high			-0.0575**	-0.0576**	-0.0576**	-0.0078
			[0.025]	[0.026]	[0.026]	[0.029]
Job Skill/relevance: high:low			0.0158	0.0071	0.0071	-0.0049
			[0.011]	[0.012]	[0.012]	[0.012]
Incumbent Work Experience			0.0256**	0.0197*	0.0197*	0.0013
			[0.011]	[0.011]	[0.011]	[0.013]
X Controls	NO	YES	YES	YES	YES	YES
Z Controls	NO	NO	YES	YES	YES	YES
Sample	Inc. can run	Inc. can run	Inc. can run	Inc. can run	Inc. can run	All elections
Method	LPM	LPM	IV	IV	IV	IV
Instruments			Pop. Adj.	Adj.	Pop. Adj.	Adj.
First Stage F Statistics			55.25	128.55	17.85	34.41
p values			[0.00]	[0.00]	[0.00]	[0.00]
Durbin-Wu-Hausman test			2.786	2.544	16.51	5.57
p values			[0.09]	[0.11]	[0.19]	[0.01]
Observations	4,878	4,504	4,504	4,504	4,504	7,886
R-squared	0.015	0.018	0.386	0.383	0.383	0.117

Notes: standard errors clustered at provincial level in brackets, * = $p < 0.1$, **= $p < 0.05$, *** = $p < 0.01$. Dependent variable is a dummy equal to one if the incumbent is re-elected and zero otherwise. Regional dummies, year dummies and municipal controls (X) are included in all regressions. X includes *per capita municipal* income, *per capita municipal* grants from upper levels of governments, population, share of population above 65 years old and below 15 years old. Social capital is the (standardized) standard social capital index, in columns (3) to (6) social capital is instrumented with the adjusted/population adjusted social capital indexes. Z controls include: plurality rule elections for municipalities with less than 15,000 inhabitants, no term limit dummy for municipalities with less than 3,000 inhabitants, majority coalition Right (Left) coalition dummies, incumbent's age and aged squared, gender, education (university or high school degree), occupation prior to mandate (high skill/low skill and experience relevant/non relevant to mandate).

Appendix

A. Proofs of Propositions and Further Results

Analysis of Voter Behaviour and Derivation of equations (5),(11). Assume first that the voter does not observe effort. Then, at the end of the first period of office, even though she observes $T_t = T^*$, the voter has no new information about the type of the incumbent, so she expects him to make an effort e^* with probability π. So, the continuation value of re-electing the incumbent is just

$$V^{inc} = u_0 + \pi \Delta u, \tag{A.1}$$

where $u_0, \Delta u$ are defined in (A.2) above. So, from (2), (A.1), the uninformed voter will vote for the incumbent if and only if

$$u_0 + \pi \Delta u - V + v_i + \omega \geq 0. \tag{A.2}$$

By a similar argument, the continuation value of re-electing the incumbent for an informed voter is:

$$V^{inc}(e) = u_0 + \Pr(i = g \,|e, r\,)\Delta u \tag{A.3}$$

where e is the level of effort set by the incumbent, and $\Pr(i = g\,|e\,)$ is the posterior probability that the incumbent is good, conditional on e. So, comparing (A.1), (A.3), the key difference is that when the voter is informed, this continuation value $V^{inc}(e)$ possibly depends on e, because e can convey information to the voter about the type of the incumbent. So, the informed voter will vote for the incumbent iff

$$u_0 + \Pr(i = g\,|e\,)\Delta u - V + v_i + w \geq 0, \tag{A.4}$$

Now, the expected differences in policy payoffs from retaining the incumbent versus not retaining him for uninformed and informed voters respectively are

$$\Delta = u_0 + \pi \Delta u - V, \Delta(e, r) = u_0 + \Pr(i = g\,|e, r\,)\Delta u - V. \tag{A.5}$$

As there are a continuum of voters, and v_i is uniform on $\left[-\frac{1}{2}, \frac{1}{2}\right]$, then from (A.2), (A.4), (A.5), the fractions of informed and uninformed voters who vote for the incumbent, conditional on ω, are

$$\frac{1}{2} + \omega + \Delta(e, r), \qquad \frac{1}{2} + \omega + \Delta \tag{A.6}$$

respectively. Now note that the incumbent will win if if the overall fraction who vote for him exceeds 0.5. Using (A.6), this requires

$$\sigma\left(\frac{1}{2} + \omega + \Delta(e, r)\right) + (1 - \sigma)\left(\frac{1}{2} + \omega + \Delta\right) \geq \frac{1}{2} \Rightarrow \omega \geq -\frac{1}{2}\left(\sigma\Delta(e) + (1 - \sigma)\Delta\right)$$

So, given that ω is uniform on $\left[-\frac{1}{2\gamma}, \frac{1}{2\gamma}\right]$, the probability that the incumbent wins is

$$p(e) \equiv \Pr\left(\omega \geq -\frac{1}{2}\left(\sigma\Delta(e) + (1 - \sigma)\Delta\right)\right) = \frac{1}{2} + \gamma\left(\sigma\Delta(e) + (1 - \sigma)\Delta\right) \tag{A.7}$$

Then, substituting (A.5) in (A.7) gives us (5) as required.

Proof of Proposition 1. The bad incumbent gets the following payoffs from pooling and separating respectively:

$$-c(e^*,0)+p(e^*,0)(R+\overline{r},\ \overline{r})+p(0,\overline{r})(R+\overline{r}) \tag{A.8}$$

where $p(e^*), p(0)$ are defined in (5) above. So, he will pool if and only if the first term in (A.8) is larger than the second. This requires, using (5), that the incumbent is willing to pool if

$$\sigma(\Pr(i=g\,|e^*,0)-\Pr(i=g\,|0,\overline{r}))\geq\frac{c(e^*)+\overline{r}}{(\gamma\Delta u(R+\overline{r})}\equiv A \tag{A.9}$$

Here, the left-hand side is the increase in the re-election probability from making high effort. In particular, if (A.9) holds with equality, the bad incumbent will be willing to randomize.

Now, as the good type always chooses e^*, a choice of $e=0$ reveals the incumbent to be bad, and so $\Pr(i=g\,|0)=0$. Moreover, from Bayes' rule,

$$\Pr(i=good\,|e^*)=\frac{\beta\pi}{\beta\pi+(1-\beta\pi)\lambda} \tag{A.10}$$

where λ is the probability that the bad incumbent pools. So, using (A.10), the pooling condition becomes

$$\sigma\frac{\beta\pi}{\beta\pi+(1-\beta\pi)\lambda}\geq A \tag{A.11}$$

If $\sigma\beta\geq\frac{A}{\pi}$, the bad incumbent has a strong incentive to pool, so (A.11) holds at $\lambda=1$. If $\sigma\leq A$, the incentives to pool are so weak that so (A.11) does not hold even at $\lambda=0$ and so the incumbent always separates. If $\sigma\beta\in[A,\frac{A}{\pi}]$, the bad incumbent must randomize with a probability λ than makes him just indifferent between the two options i.e. λ must solve (A.11) holding at equality. This gives

$$\lambda=\frac{\beta\pi}{1-\beta\pi}\left(\frac{\sigma}{A}-1\right) \tag{A.12}$$

as required. □

Proof of Proposition 3. First assume $\sigma\beta\leq A$, so that $\lambda=0$. Then, (11) gives

$$p=\frac{1}{2}+\gamma\sigma\Delta u\pi\ (1-\beta) \tag{A.13}$$

So, by inspection, p is decreasing in β and strictly increasing in σ if $\beta<1$; otherwise, it is indenpendent of σ.

Now assume $A\leq\sigma\beta\leq\frac{A}{\pi}$ so that $\lambda\in[0,1]$. Then, using (6) to substiute out λ in (11), after simplification, we obtain

$$p=\frac{1}{2}-\gamma\Delta u\pi\left(\frac{\sigma}{A}-1\right)\beta+\gamma\Delta u\times f(\beta),\qquad f(\beta)=\left(\frac{\pi-\beta\pi}{1-\beta\pi}\right)(A-\pi\beta\sigma) \tag{A.14}$$

Inspection of (A.14) makes it clear that $f(.)$ is decreasing in β. As the second term in (A.14) is also decreasing in β, p will be strictly decreasing in β overall. Also, it is clear that p is decreasing in σ.

Finally, assume $\sigma\Delta u\pi\geq A$ so that $\lambda=1$. Then, (11) becomes

$$p=\frac{1}{2}-\gamma(1-\beta\pi)\Delta u \tag{A.15}$$

By inspection of (A.15), p is increasing in β and independent of σ. $\square$

Proof of Proposition 4. It remains to deal with the two cases with no pooling and partial pooling.

(i) $\beta\sigma \leq A$. In this case $\lambda = 0$, and so using (11), it is easily calculated that

$$\Pr(i = g \,|\text{win}) = \pi \frac{0.5 + \gamma\sigma\Delta u(1-\beta\pi)}{0.5 + \gamma\sigma\Delta u\pi(1-\beta)} \tag{A.16}$$

In this case, by inspection, (A.16) is increasing in both β, σ.

(ii) $\frac{A}{\pi} > \beta\sigma > A$. First, we study the effect of β on e_2. Substituting (6) into (5), and rearranging, we get

$$p(e^*) = \frac{1}{2} - \gamma\Delta u\pi\left(\frac{\sigma}{A} - 1\right)\beta + \gamma\Delta u\left(A - \beta\pi\sigma\right) \tag{A.17}$$

Also from (A.14) we have

$$p = \frac{1}{2} - \gamma\Delta u\pi\left(\frac{\sigma}{A} - 1\right)\beta + \gamma\Delta u\left(A - \beta\pi\sigma\right)\left(\frac{\pi - \beta\pi}{1 - \beta\pi}\right) \tag{A.18}$$

So, combining (A.17) and (A.18), we can write

$$\frac{p(e^*)}{p} = f(\beta, \sigma) \equiv \frac{h(\beta, \sigma)}{g(\beta, \sigma)}$$

where

$$h(\beta, \sigma) = C - \pi\left(\frac{\sigma}{A} - 1\right)\beta + (A - \beta\pi\sigma) \tag{A.19}$$

$$g(\beta, \sigma) = C - \pi\left(\frac{\sigma}{A} - 1\right)\beta + (A - \beta\pi\sigma)\,\phi(\beta) \tag{A.20}$$

and where $C = \frac{1}{2\gamma\Delta u}\,\phi(\beta) = \frac{\pi - \beta\pi}{1 - \beta\pi}$.

By the ratio rule of calculus, $f_\beta > 0$ if $h_\beta g > g_\beta h$. Moreover, by inspection of (A.19), (A.20), $h > g > 0$, $g_\beta, h_\beta < 0$. So $f_\beta > 0$ if $-h_\beta g < -g_\beta h$. But from (A.19),(A.20), we have:

$$-h_\beta = \pi\left(\frac{\sigma}{A} - 1\right) + \pi\sigma \tag{A.21}$$

$$\begin{aligned} -g_\beta &= \pi\left(\frac{\sigma}{A} - 1\right) + \pi\sigma\phi - (A - \beta\pi\sigma)\,\phi'(\beta) \qquad \text{(A.22)} \\ &= \pi\left(\frac{\sigma}{A} - 1\right) + \pi\sigma\phi + (A - \beta\pi\sigma)\,\frac{\pi(1-\pi)}{(1-\beta\pi)^2} \text{ as } \phi'(\beta) = -\frac{\pi(1-\pi)}{(1-\beta\pi)^2} \end{aligned}$$

Moreover, as $\lambda \in (0, 1)$, $\frac{\sigma}{A} < \frac{1}{\beta\pi}$ implying $A - \beta\pi\sigma > 0$. So, clearly from (A.21), $-g_\beta > -h_\beta$, so as $h > g$, $-h_\beta g < -g_\beta h$ as required.

Now, we turn to the effect of σ on e_2. By the ratio rule of calculus, $f_\sigma > 0$ if $h_\sigma g > g_\sigma h$. Moreover, it is easily checked from (A.21) that $\Delta = h_\sigma g - g_\sigma h$ is

$$\Delta = -\left(\frac{\pi\beta}{A} + \pi\beta\right)g + \left(\frac{\pi\beta}{A} + \pi\beta\phi\right)h$$

After some simplification, using (A.19), (A.20), we see that $\Delta > 0$ if $1 - \pi\beta > \frac{1}{2\gamma\Delta u}$. This holds for all β if $1 - \pi > \frac{1}{2\gamma\Delta u}$. $\square$

Online Appendix

Table N.1: **Resident population: place of birth and place of usual residence**

	Share of residents born residence province	Share of residents born different province of residence region	Share of residents born other regions		Share of residents born residence province	Share of residents born different province of residence region	Share of residents born other regions
Provinces							
Agrigento	0.854	0.118	0.028	Messina	0.899	0.052	0.049
Alessandria	0.643	0.053	0.304	Milano	0.596	0.114	0.289
Ancona	0.796	0.070	0.133	Modena	0.704	0.087	0.209
Arezzo	0.750	0.085	0.165	Monza e della Brianza	0.518	0.257	0.225
Ascoli Piceno	0.807	0.060	0.133	Napoli	0.923	0.051	0.026
Asti	0.570	0.224	0.206	Novara	0.565	0.080	0.355
Avellino	0.809	0.147	0.044	Nuoro	0.836	0.119	0.045
Bari	0.915	0.042	0.043	Ogliastra	0.828	0.118	0.055
Barletta-Andria-Trani	0.853	0.111	0.036	Olbia-Tempio	0.621	0.268	0.111
Belluno	0.817	0.068	0.114	Oristano	0.780	0.160	0.060
Benevento	0.827	0.127	0.046	Padova	0.784	0.129	0.087
Bergamo	0.813	0.096	0.091	Palermo	0.924	0.045	0.030
Biella	0.603	0.166	0.231	Parma	0.724	0.068	0.208
Bologna	0.671	0.105	0.224	Pavia	0.607	0.148	0.245
Bolzano	0.891	0.023	0.086	Perugia	0.832	0.014	0.154
Brescia	0.839	0.067	0.094	Pesaro e Urbino	0.764	0.048	0.188
Brindisi	0.867	0.094	0.039	Pescara	0.677	0.188	0.135
Cagliari	0.827	0.115	0.058	Piacenza	0.737	0.037	0.226
Caltanissetta	0.838	0.135	0.027	Pisa	0.663	0.146	0.191
Campobasso	0.822	0.022	0.156	Pistoia	0.609	0.203	0.188
Carbonia-Iglesias	0.831	0.113	0.056	Pordenone	0.699	0.060	0.240
Caserta	0.761	0.173	0.066	Potenza	0.863	0.025	0.112
Catania	0.896	0.073	0.031	Prato	0.524	0.247	0.229
Catanzaro	0.894	0.049	0.057	Ragusa	0.897	0.072	0.031
Chieti	0.803	0.071	0.126	Ravenna	0.677	0.162	0.161
Como	0.601	0.205	0.193	Reggio Calabria	0.919	0.024	0.057
Cosenza	0.906	0.026	0.069	Reggio Emilia	0.674	0.111	0.215
Cremona	0.696	0.188	0.115	Rieti	0.655	0.197	0.148
Crotone	0.808	0.135	0.057	Rimini	0.656	0.104	0.241
Cuneo	0.780	0.104	0.117	Roma	0.729	0.042	0.230
Enna	0.809	0.165	0.026	Rovigo	0.778	0.097	0.126
Fermo	0.696	0.212	0.092	Salerno	0.859	0.093	0.049
Ferrara	0.770	0.073	0.156	Sassari	0.867	0.078	0.055
Firenze	0.715	0.106	0.179	Savona	0.602	0.086	0.312
Foggia	0.920	0.020	0.060	Siena	0.714	0.086	0.201
Forlì-Cesena	0.765	0.086	0.149	Siracusa	0.803	0.154	0.043
Frosinone	0.839	0.080	0.081	Sondrio	0.862	0.078	0.059
Genova	0.735	0.023	0.243	Taranto	0.845	0.093	0.062
Gorizia	0.661	0.172	0.167	Teramo	0.788	0.050	0.162
Grosseto	0.690	0.105	0.205	Terni	0.754	0.072	0.173
Imperia	0.615	0.048	0.337	Torino	0.658	0.053	0.290
Isernia	0.770	0.035	0.195	Trapani	0.902	0.063	0.035
L'Aquila	0.814	0.042	0.144	Trento	0.833	0.024	0.143
La Spezia	0.671	0.044	0.285	Treviso	0.777	0.122	0.101
Latina	0.666	0.156	0.178	Trieste	0.793	0.052	0.155
Lecce	0.912	0.040	0.048	Udine	0.794	0.066	0.140
Lecco	0.631	0.243	0.126	Valle d'Aosta	0.683		0.317
Livorno	0.664	0.156	0.180	Varese	0.622	0.122	0.256
Lodi	0.586	0.246	0.167	Venezia	0.766	0.124	0.110
Lucca	0.776	0.102	0.122	Verbano-Cusio-Ossola	0.702	0.067	0.231
Macerata	0.783	0.116	0.101	Vercelli	0.571	0.189	0.240
Mantova	0.710	0.083	0.207	Verona	0.829	0.041	0.130
Massa-Carrara	0.717	0.091	0.192	Vibo Valentia	0.850	0.098	0.051
Matera	0.815	0.036	0.149	Vicenza	0.837	0.085	0.078
Medio Campidano	0.744	0.216	0.040	Viterbo	0.648	0.176	0.175
Municipalities (largest cities only							
Bari	0.897	0.050	0.053	Parma	0.707	0.064	0.229
Bologna	0.639	0.091	0.271	Perugia	0.813	0.014	0.174
Brescia	0.796	0.052	0.152	Prato	0.532	0.230	0.238
Catania	0.889	0.081	0.030	Ravenna	0.627	0.167	0.206
Firenze	0.695	0.098	0.207	Reggio Calabria	0.916	0.018	0.066
Genova	0.725	0.021	0.255	Reggio Emilia	0.705	0.059	0.236
Livorno	0.710	0.131	0.159	Roma	0.712	0.040	0.249
Messina	0.911	0.032	0.057	Taranto	0.864	0.058	0.078
Milano	0.587	0.092	0.321	Torino	0.596	0.063	0.341
Modena	0.702	0.069	0.228	Trieste	0.786	0.050	0.164
Napoli	0.940	0.029	0.031	Venezia	0.816	0.073	0.111
Padova	0.714	0.122	0.164	Verona	0.784	0.044	0.172
Palermo	0.915	0.054	0.031				

Table N.2: **Matrix of bilateral regional migration stocks**

Region of Residence:	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
Region of Birth:																				
Piemonte [1]	0.737	0.105	0.048	0.011	0.004	0.005	0.006	0.007	0.006	0.004	0.004	0.004	0.004	0.005	0.002	0.004	0.004	0.006	0.004	0.008
Valle d'Aosta [2]	0.001	0.683	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Liguria [3]	0.013	0.011	0.726	0.004	0.002	0.002	0.003	0.004	0.009	0.002	0.002	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.004
Lombardia [4]	0.031	0.027	0.031	0.797	0.018	0.017	0.014	0.028	0.012	0.008	0.012	0.008	0.008	0.006	0.004	0.006	0.005	0.008	0.006	0.009
Trentino Alto Adige [5]	0.001	0.002	0.002	0.002	0.885	0.006	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Veneto [6]	0.031	0.022	0.009	0.024	0.033	0.897	0.058	0.015	0.006	0.003	0.004	0.006	0.003	0.002	0.001	0.002	0.001	0.001	0.002	0.003
Friuli-Venezia Giulia [7]	0.003	0.003	0.003	0.003	0.003	0.013	0.829	0.002	0.002	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.001
Emilia-Romagna [8]	0.008	0.008	0.017	0.014	0.006	0.008	0.005	0.798	0.011	0.005	0.016	0.008	0.006	0.003	0.002	0.002	0.002	0.002	0.002	0.003
Toscana [9]	0.004	0.007	0.026	0.005	0.002	0.003	0.003	0.008	0.819	0.019	0.004	0.009	0.003	0.002	0.001	0.001	0.002	0.002	0.002	0.003
Umbria [10]	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.008	0.841	0.006	0.012	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.001
Marche [11]	0.002	0.002	0.003	0.003	0.001	0.001	0.002	0.010	0.004	0.012	0.865	0.012	0.021	0.002	0.000	0.001	0.001	0.000	0.000	0.001
Lazio [12]	0.005	0.007	0.007	0.006	0.005	0.005	0.009	0.007	0.014	0.042	0.014	0.795	0.027	0.020	0.008	0.003	0.005	0.005	0.003	0.008
Abruzzo [13]	0.003	0.004	0.005	0.003	0.001	0.002	0.002	0.005	0.004	0.005	0.011	0.018	0.860	0.032	0.001	0.002	0.001	0.001	0.000	0.001
Molise [14]	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.002	0.001	0.001	0.002	0.005	0.011	0.833	0.002	0.002	0.001	0.000	0.000	0.000
Campania [15]	0.027	0.013	0.022	0.026	0.010	0.011	0.022	0.038	0.039	0.025	0.020	0.048	0.018	0.053	0.961	0.009	0.034	0.011	0.004	0.006
Puglia [16]	0.035	0.010	0.014	0.030	0.008	0.010	0.015	0.025	0.013	0.009	0.020	0.018	0.019	0.031	0.004	0.952	0.052	0.005	0.003	0.003
Basilicata [17]	0.010	0.002	0.004	0.006	0.001	0.001	0.002	0.005	0.006	0.002	0.002	0.004	0.002	0.002	0.004	0.006	0.875	0.006	0.000	0.000
Calabria [18]	0.032	0.061	0.032	0.022	0.007	0.005	0.006	0.014	0.012	0.008	0.004	0.019	0.004	0.003	0.003	0.003	0.011	0.939	0.005	0.002
Sicilia [19]	0.042	0.017	0.033	0.032	0.009	0.011	0.017	0.022	0.025	0.009	0.008	0.018	0.006	0.004	0.003	0.004	0.003	0.011	0.966	0.006
Sardegna [20]	0.011	0.012	0.013	0.007	0.003	0.003	0.004	0.005	0.007	0.004	0.003	0.008	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.940

Table N.3: MUNICIPAL PERFORMANCE EQUATION: RESTRICTED SAMPLES

Dependent variable: Performance	(1)	(2)	(3)	(4)	(5)	(6)
SC x No Term Limit	0.4163***	0.6838***	0.6919***	0.4029***	0.6623***	0.6795***
	[0.036]	[0.029]	[0.029]	[0.036]	[0.031]	[0.031]
SC x Term Limit	0.3423***	0.5451***	0.5570***	0.3365***	0.5525***	0.5449***
	[0.045]	[0.037]	[0.037]	[0.047]	[0.045]	[0.040]
Term limit	-0.0655	-0.0812***	-0.0815***	-0.0749	-0.0943***	-0.0911***
	[0.051]	[0.030]	[0.030]	[0.053]	[0.034]	[0.034]
Income	-0.0695***	-0.0795***	-0.0791***	-0.0670***	-0.0780***	-0.0774***
	[0.010]	[0.005]	[0.005]	[0.010]	[0.006]	[0.006]
Grants	-0.0007***	-0.0008***	-0.0008***	-0.0008***	-0.0008***	-0.0008***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Majority Coalition Left	0.1316**	0.1123***	0.1130***	0.1495**	0.1332***	0.1350***
	[0.063]	[0.034]	[0.034]	[0.066]	[0.038]	[0.038]
Majority Coalition Right	0.0350	0.0297	0.0297	0.0505	0.0457	0.0466
	[0.052]	[0.029]	[0.029]	[0.055]	[0.032]	[0.032]
Small	-0.0456	0.0104	0.0092	-0.0410	0.0109	0.0080
	[0.046]	[0.024]	[0.024]	[0.046]	[0.026]	[0.026]
First past the post	-0.1243*	-0.0791**	-0.0803**	-0.0954	-0.0524	-0.0550
	[0.068]	[0.034]	[0.034]	[0.070]	[0.037]	[0.037]
Incumbent Female	0.1160**	0.1020***	0.1022***	0.1128**	0.0965***	0.0965***
	[0.048]	[0.025]	[0.025]	[0.048]	[0.027]	[0.027]
Incumbent Age	0.0154	0.0132*	0.0133*	0.0158	0.0140*	0.0141*
	[0.014]	[0.008]	[0.008]	[0.014]	[0.008]	[0.008]
Incumbent Degree	0.0431	0.0212	0.0217	0.0431	0.0227	0.0235
	[0.065]	[0.034]	[0.034]	[0.066]	[0.037]	[0.037]
Incumbent Skills & Experience	-0.0130	-0.0028	-0.0030	-0.0175	-0.0093	-0.0095
	[0.048]	[0.026]	[0.026]	[0.049]	[0.027]	[0.027]
Observations	37,924	37,324	37,324	32,760	32,241	32,241
Year Dummies	YES	YES	YES	YES	YES	YES
Region Dummies	YES	YES	YES	YES	YES	YES
Year Dummies × Region Dummies	YES	YES	YES	YES	YES	YES
Method	OLS	IV	IV	OLS	IV	IV
Instruments		Adj.	Pop. Adj.		Adj.	Pop. Adj.
First Stage F-statistics		1253.50	1131.21		985.11	1000.30
p-values		[0.00]	[0.00]		[0.00]	[0.00]
First Stage F-statistics		671.73	349.43		297.44	304.88
p-values		[0.00]	[0.00]		[0.00]	[0.00]
Durbin-Wu-Hausman test		117.16	109.60		112.922	105.364
p values		[0.00]	[0.00]		[0.00]	[0.00]
Observations	37,924	37,924	37,924	32,760	32,760	32,760
R-squared	0.241	0.225	0.225	0.232	0.215	0.216
Sample	Excl. MI, TO, RO	Excl. MI, TO, RO	Excl. MI, TO, RO	Post 2011	Post 2011	Post 2011

Notes: standard errors clustered at municipal level in brackets, * = $p < 0.1$, **= $p < 0.05$, *** = $p < 0.01$. Dependent variable is the Opencivitas Performance Indicators. Regional dummies, year dummies and municipal controls (Z) are included in all regressions. Z includes *per capita municipal* income, *per capita municipal* grants from upper levels of governments, population, share of population above 65 years old and below 15 years old. Social capital is the (standardized) standard social capital index, in columns (2)and (5) social capital is instrumented with the population adjusted SC index in columns (3)and (6) with the adjusted social capital index. X controls include: plurality rule elections for municipalities with less than 15,000 inhabitants, no term limit dummy for municipalities with less than 3,000 inhabitants, majority coalition Right (Left) coalition dummies, mayor's age and aged squared, gender, education (university or high school degree), occupation prior to mandate (high skill/low skill and experience relevant/non relevant to mandate).

Table N.4: MUNICIPAL OUTPUT EQUATION: RESTRICTED SAMPLES

Dependent Variable: Output	(1)	(2)	(3)	(4)	(5)	(6)
SC x No Term Limit	0.6882***	1.3477***	1.3146***	0.6886***	1.3470***	1.3254***
	[0.026]	[0.043]	[0.042]	[0.028]	[0.045]	[0.045]
SC x Term Limit	0.6069***	1.0613***	1.0353***	0.6226***	1.0580***	1.0071***
	[0.035]	[0.051]	[0.051]	[0.038]	[0.055]	[0.062]
Term limit	-0.0292	-0.0772*	-0.0762*	-0.0268	-0.0797	-0.0836*
	[0.045]	[0.045]	[0.045]	[0.050]	[0.050]	[0.051]
Income	0.0904***	0.0642***	0.0657***	0.0951***	0.0679***	0.0693***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Grants	0.0005***	0.0009***	0.0009***	0.0005***	0.0009***	0.0008***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Majority Coalition Left	0.4464***	0.3909***	0.3941***	0.4928***	0.4463***	0.4477***
	[0.050]	[0.050]	[0.050]	[0.054]	[0.055]	[0.055]
Majority Coalition Right	0.1840***	0.1692***	0.1698***	0.2026***	0.1884***	0.1878***
	[0.044]	[0.044]	[0.044]	[0.048]	[0.048]	[0.048]
Small	0.0323	0.1454***	0.1401***	0.0472	0.1607***	0.1576***
	[0.035]	[0.035]	[0.035]	[0.037]	[0.038]	[0.038]
First past the post	-0.2914***	-0.1947***	-0.1997***	-0.2819***	-0.1877***	-0.1908***
	[0.050]	[0.050]	[0.050]	[0.054]	[0.054]	[0.054]
Incumbent Female	0.1589***	0.1283***	0.1289***	0.1512***	0.1173***	0.1181***
	[0.038]	[0.038]	[0.038]	[0.041]	[0.041]	[0.041]
Incumbent Age	-0.0073	-0.0093	-0.0091	-0.0039	-0.0071	-0.0069
	[0.011]	[0.011]	[0.011]	[0.012]	[0.012]	[0.012]
Incumbent Degree	0.0793	0.0349	0.0369	0.0899*	0.0458	0.0473
	[0.051]	[0.052]	[0.051]	[0.054]	[0.055]	[0.055]
Incumbent Highly	-0.0178	0.0050	0.0043	-0.0192	0.0013	0.0007
Skilled & Experienced	[0.037]	[0.038]	[0.038]	[0.040]	[0.040]	[0.040]
Year Dummies	YES	YES	YES	YES	YES	
Region Dummies	YES	YES	YES	YES	YES	YES
Year Dummies × Region Dummies	YES	YES	YES	YES	YES	yes
Method	OLS	IV	IV	OLS	IV	IV
Instruments		Adj.	Pop. Adj.		Adj.	Pop. Adj.
First Stage F-statistics		1253.50	1131.21		985.11	1000.30
p-values		[0.00]	[0.00]		[0.00]	[0.00]
First Stage F-statistics		671.73	349.43		297.44	304.88
p-values		[0.00]	[0.00]		[0.00]	[0.00]
Durbin-Wu-Hausman test		117.16	109.60		112.922	105.364
p values		[0.00]	[0.00]		[0.00]	[0.00]
Observations	37,924	37,924	37,924	32,760	32,760	32,760
R-squared	0.222	0.209	0.211	0.217	0.205	0.206
Sample	Excl. MI, TO, RO	Excl. MI, TO, RO	Excl. MI, TO, RO	Post 2011	Post 2011	Post 2011

Notes: standard errors clustered at municipal level in brackets, * = $p < 0.1$, **= $p < 0.05$, *** = $p < 0.01$. Dependent variable is the Opencivitas Performance Indicators. Regional dummies, year dummies and municipal controls (Z) are included in all regressions. Z includes *per capita municipal* income, *per capita municipal* grants from upper levels of governments, population, share of population above 65 years old and below 15 years old. Social capital is the (standardized) standard social capital index, in columns (2)and (5) social capital is instrumented with the population adjusted SC index in columns (3)and (6) with the adjusted social capital index. X controls include: plurality rule elections for municipalities with less than 15,000 inhabitants, no term limit dummy for municipalities with less than 3,000 inhabitants, majority coalition Right (Left) coalition dummies, mayor's age and aged squared, gender, education (university or high school degree), occupation prior to mandate (high skill/low skill and experience relevant/non relevant to mandate).