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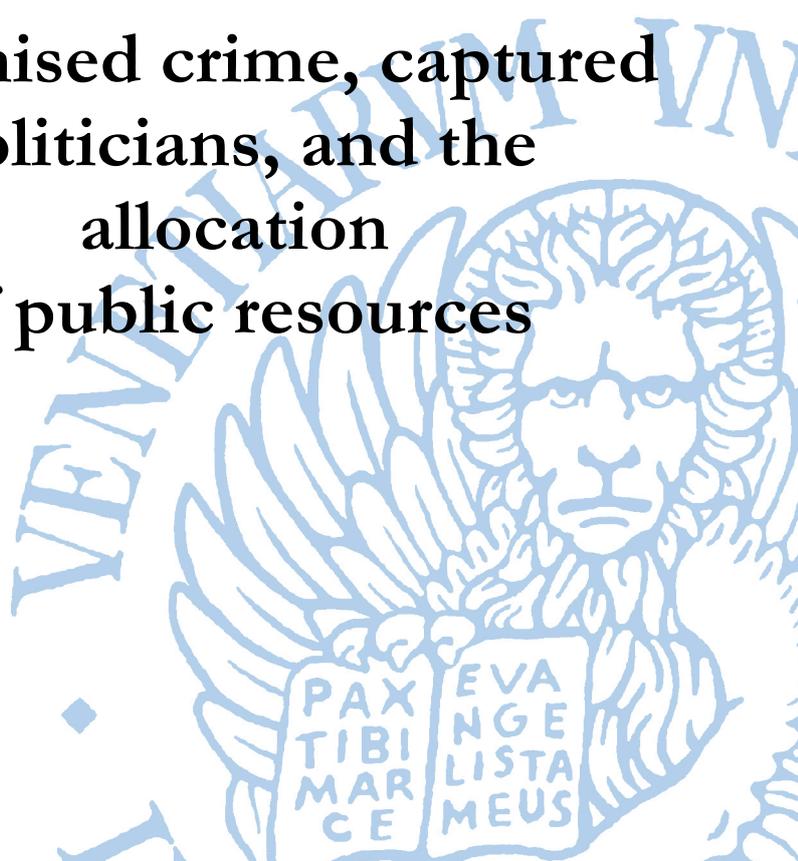
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politicians, and the
allocation
of public resources**

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What is the impact of collusion between members of criminal organisations and politicians on local public finances, in contexts in which organised crime is well-rooted? This paper addresses this question by focusing on local governments of Southern Italy, over the period 1998-2016. In order to capture the presence of organised crime, we exploit the enforcement of a national law allowing the dissolution of a municipal government upon evidence of collusion between elected officials and the mafia. We measure the consequences of this infiltration of mafia groups within local governments by using data on local public finances at the municipality level. Difference-in-differences estimates reveal that captured municipalities commit on average more resources for investments in construction and waste management and are less effective in collecting taxes for waste and garbage. This indicates that organised crime groups exploit the collusion with local politicians in order to distort the allocation of public resources towards key sectors of strategic interest for the criminal business.

Keywords

Organised crime, collusion, local public finance, municipalities, Italy

JEL Codes

K42, H72, D72

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Organised Crime, Captured Politicians, and the Allocation of Public Resources

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Abstract

What is the impact of collusion between members of criminal organisations and politicians on local public finances, in contexts in which organised crime is well-rooted? This paper addresses this question by focusing on local governments of Southern Italy, over the period 1998-2016. In order to capture the presence of organised crime, we exploit the enforcement of a national law allowing the dissolution of a municipal government upon evidence of collusion between elected officials and the mafia. We measure the consequences of this *infiltration* of mafia groups within local governments by using data on local public finances at the municipality level. Difference-in-differences estimates reveal that captured municipalities commit on average more resources for investments in construction and waste management and are less effective in collecting taxes for waste and garbage. This indicates that organised crime groups exploit the collusion with local politicians in order to distort the allocation of public resources towards key sectors of strategic interest for the criminal business. (JEL K42, H72, D72)

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1 Introduction

Organised crime is detrimental to the efficiency of any democratic or economic system (Gambetta and Reuter, 1995; Pinotti, 2015; Acemoglu, Robinson and Santos, 2013). Its presence reflects institutional failure and has the potential to influence key aspects of legal economic activity, ultimately undermining the long run development of any society (Shleifer and Vishny, 1993). Its strength, as well as its influence on the legal economy, relies on the diffused external complicity, i.e. an increasingly close relationship between organised crime groups and public officials such as national or local politicians and public administrators (Alesina, Piccolo and Pinotti, 2018). Thanks to the development of such networks, organised crime has become highly pervasive and fully integrated into the everyday socio-economic and political life of many countries in the world (Allum and Siebert, 2003; Le Moglie and Sorrenti, 2020).

Yet, understanding the extent to which these dynamics condition the choices and activities of policy-makers is far from easy. What impact does collusion between members of criminal organisations and politicians have on the allocation of public resources and on the collection of fiscal revenues, in contexts in which organised crime is well-rooted? In this paper, we tackle this question by investigating a particular aspect of organised crime activity: its *infiltration* within local governments. Such infiltration occurs when criminal groups manage to capture local politicians, who in turn may manipulate policy decisions in their favour. We study the case of Italy by using a yearly municipal-level dataset for the three Italian regions where organised crime is most widespread and rooted: Calabria, Campania and Sicily, over the period 1998-2016.¹

In order to measure the presence of organised crime, we exploit National Law 164/1991,

¹A focus on southern regions rather than on Italy as a whole has the advantage of restricting the sample to a relatively homogeneous area in terms of unobservable elements such as culture or social capital, traditionally considered as highly diversified across this country (Putnam, 1993). Moreover, as outlined in section 2, city council dismissals are rare in the north of the country.

which imposes the dissolution of a municipal government upon evidence of collusion between elected officials and criminal organisations. The enforcement of this policy is used to identify cases of plausible criminal infiltration. In particular, we classify as infiltrated (treated) the last municipal legislature before a city council is dissolved through the implementation of Law 164/1991, from the moment of its election until the moment of its dissolution. The control group is composed by local governments that have never experienced a dissolution and, for treated municipalities, only by the legislatures preceding the beginning of the infiltration. All post-dissolution years are excluded, in order to avoid any contamination in the control group (Fenizia and Saggio, 2020). We then estimate a difference-in-differences model comparing municipal governments with and without infiltration, before and during the infiltration. We provide evidence on the parallel trends assumption and on the validity of the treatment definition.

The analysis reveals that the capture of local governments by organised crime does not affect the total level of public spending, but does have consequences both for the allocation of public resources and for the collection of fiscal revenues. In particular, infiltrated local governments modify capital account expenditures in sectors that are strategic to the interests of organised crime. This effect is economically sizeable. According to our estimates, infiltration leads to around 14% increase in the share of total investment allocated for construction and waste management. Moreover, infiltrated municipalities appear to be less effective in collecting fiscal revenues from the waste and garbage tax. Specifically, they exhibit a reduction of approximately 20% in the outcome variable, which is defined as the amount of collected revenues divided by the forecasted revenues on a yearly basis.

We also find some, albeit weaker, evidence of the consequences of infiltration on other public finance items. Infiltrated municipalities exhibit a reduction in the amount of resources dedicated to capital expenditures for transport and lighting, possibly reflecting an attempt of local administrators to keep the budget in order during infiltrations after the

increase in investment for construction and waste management. In addition, other characteristics of infiltrated local governments include a lower capacity to collect fiscal revenues - a result likely driven by waste taxes - and a higher municipal debt toward third parties.

Since the presence of organised crime is clearly not random, our empirical analysis has to deal with the presence of potential confounders. We discuss them in detail in the paper and show that the results are robust to exogeneity checks, changes in specification, and placebo tests, thus minimising endogeneity concerns. Moreover, since our estimates could pick up some non-mafia related effects (e.g. low quality of politicians, unstable governments) or be determined by political characteristics of the municipal elections potentially correlated with infiltrations, we provide evidence to ensure that the results are driven by mafia collusion and not by any of these components.

All in all, our findings suggest that criminal organisations exploit the capturing of local administrators in order to distort the allocation of resources towards sectors of strategic interest for their business. The increase in resources dedicated to capital expenditures for construction and waste management appears to be associated with a higher amount of resources tendered out via public procurement contracts in this specific sector. In spite of the higher expenses for waste management, waste collection services provided by municipalities do not seem to improve during infiltrations, possibly contributing to make citizens less willing to pay taxes for the service. This evidence confirms the existence of rooted interests of criminal groups in the waste management and construction sector.

This paper contributes to different strands of the literature. First, a recent but growing literature has measured the presence and intensity of mafia activity by employing proxies such as the number of mafia-related crimes, murders, and violent attacks (Alesina, Piccolo and Pinotti, 2018; Daniele and Marani, 2011; Barone and Narciso, 2015), historical or geological indicators (Acemoglu, De Feo and De Luca, 2020; Bandiera, 2003; Dimico, Isopi and Olsson, 2017; De Feo and De Luca, 2017; Buonanno et al., 2015; Buonanno, Vanin

and Prarolo, 2016), or forced displacement policies (Scognamiglio, 2018). An important strand of these studies has focused on the impact of mafia-government linkages on political and electoral outcomes.² Most of these works measure the presence of criminal organisations with proxies of violence. While this is certainly a distinctive behaviour of criminal activities, it might represent the tip of the iceberg of the real strength of these organisations. The consequences of more subtle criminal actions that do not employ any use of violence are still underexplored in the literature. By using a measure of organised crime activity reflecting the collusion between organised crime and politicians, we contribute to shed light on this more silent but equally dangerous phenomenon and, in doing so, to assess its impact on the allocation of public resources.

Second, the study of local criminal capturing of politicians naturally relates to the vast literature studying the consequences of corrupted public officers and of anti-corruption policies on the allocation of public spending (Shleifer and Vishny, 1993; Bandiera, Pratt and Valletti, 2009), public procurement (Coviello and Mariniello, 2014; Decarolis et al., 2020; Tulli, 2019), economic and labour market outcomes (Colonelli and Mounu, 2021; Fenizia and Saggio, 2020), as well as to the set of works measuring the elite capture of public resources or public service delivery (Ferraz and Finan, 2008, 2011; Slutzky and Zeume, 2019). To this literature, we contribute by exploring the consequences a very peculiar typology of corruption – the criminal capturing of local politicians while in power. In addition, while many empirical works have analysed how powerful interest groups interfere with government choices through corruption (Tanzi and Davoodi, 1997; Mauro, 1998; Gupta, de Mello and Sharan, 2001; Rajkumar and Swaroop, 2008; Crescenzi, Di Cataldo

²For example, Alesina, Piccolo and Pinotti (2018) and Daniele and Dipoppa (2017) investigate how criminal organisations strategically use violence to influence elections and get captured politicians elected. Other studies have examined how criminal organisations choose their political counterparts (Dal Bó, Dal Bó and Di Tella, 2006; Buonanno et al., 2015), uncovering different strategies. De Feo and De Luca (2017) argue that the mafia sells votes to the party that has more core supporters and it is therefore expected to win. Buonanno, Vanin and Prarolo (2016) find a systematic correlation between the strength of *Cosa Nostra* and the proportion of votes for the main Italian conservative party.

and Rodríguez-Pose, 2016), much less evidence exists on the resource allocation induced by the rent-seeking behaviour of *organised crime*. A notable exception is the work of Barone and Narciso (2015), arguing that the presence of organised crime affects the distribution of national public funds to firms.

Finally, this paper also relates to a more recent empirical literature attempting to measure the economic effects of organised crime and the consequences of its infiltration within the legal economy (Pinotti, 2015; Tulli, 2019). Mirenda et al. (2019) claim that the infiltration of the Calabrian mafia within firms has negative long-run effects on local economic growth. Le Moglie and Sorrenti (2020) show that Italian territories where criminal organisations are more rooted suffer less during economic downturns. Our paper contributes to this effort of understanding the attempt by organised crime to take control of portions of the legal economy by exploring how criminal organisations exploit political capturing to bias the allocation of public resources towards sectors of strategic interest.

The Law 164/1991 examined here has been previously employed in the empirical literature (Acconcia, Corsetti and Simonelli, 2014; Daniele and Geys, 2015, 2016; Galletta, 2017; Fenizia and Saggio, 2020).³ Our contribution is the attempt to capture the impact of organised crime *during* its infiltration within local governments. More specifically, our focus is on the period *before* the enforcement of the law, i.e. *before* the dissolution of mafia-infiltrated municipalities took place.

The rest of the paper is organised as follows: section 2 focuses on the institutional setting and provides background on organised crime infiltrations and political capture; section

³Acconcia, Corsetti and Simonelli (2014) exploit temporary contraction in public investment occurring in post-dissolution periods to obtain estimates of the fiscal multiplier for Italian provinces. Daniele and Geys (2015, 2016) provide an assessment of the impact of Law 164/1991 on different post-dissolution outcomes, such as elected politicians' levels of education and turnout at local elections. Galletta (2017) investigates the presence of spillover effects resulting from the application of Law 164/1991 and shows a reduction of public investment in municipalities neighbouring dissolved ones. In a compelling paper, Fenizia and Saggio (2020), studies the post-dissolution period and shows that firms winning tenders before dissolutions are significantly less likely to do so afterwards.

3 discusses our identification strategy; section 4 illustrates the data and the estimating equation; section 5 presents the main results; sections 6 and section 7 present a set of exogeneity tests and robustness tests, respectively; section 8 concludes.

2 Institutional setting

*“Organised crime has globalised and turned into one of the world’s foremost economic and armed powers”.*⁴ Its illegal activities and illicit flows affect the entire world, and they generate revenues of around \$870 billion. In Italy, according to recent estimates, its total combined annual earnings generate a turnover of approximately 1.7% of the Italian GDP (Transcrime, 2013).⁵ The main sources of revenue are illegal activities such as drug trafficking, extortion and corruption. However, as Schelling (1971) would put it, *“burglars may operate in the underworld, but they seek to govern the real world”*. Organised crime has evolved significantly in recent decades. In many countries, mafia groups have become increasingly sophisticated and their business model has shifted from one based on extortion to one based on entrepreneurship (Le Moglie and Sorrenti, 2020). Criminal organisations have realised the importance of re-investing substantial portions of their profits within the legal economy. In light of this transformation, the nature of the relationship between the mafia and the State has also changed. Rather than representing an enemy to fight, the government has become an opportunity to exploit. Italy has experienced this change *prima facie*. Since the 1980s, the country has witnessed a rise in cases of collusion of the mafia with politics, particularly at the local level. This led the central government to introduce a tougher set of anti-mafia measures in the 1990s.

⁴Statement from Antonio Maria Costa, Executive Director of the United Nations Office on Drugs and Crime (UNODC): unodc.org/unodc/en/press/releases/2010/June/organized-crime-has-globalized-and-turned-into-a-security-threat.html

⁵<https://www.transcrime.it/wp-content/uploads/2014/02/Sintesi-Pon.pdf>

Law 164/1991. In an effort to tackle cases of collusion between local politicians and members of organised crime, a new law has been introduced in 1991, imposing the dissolution of a city council upon evidence of “mafia infiltration” within the local government. Law 164/1991 states that the national government can decree the dissolution of a municipal government “*when evidence emerges regarding direct or indirect links between members of the local government and criminal organisations [...] jeopardising the free will of the electoral body and the sound functioning of the municipal administration*”.⁶ The dissolution of a local government requires a number of precise and rigid steps. First, a case for dissolution must be put forth by the provincial prefect, who has been informed by either magistrates or the police of the risk of infiltration of a municipal government. The prefect then establishes a commission composed of the vice-prefect and officials from different law enforcement bodies (the *Polizia di Stato*, the military *Carabinieri* and the *Guardia di Finanza*). The commission investigates the local government’s activity over a maximum three months at the end of which the investigators draft a report. The provincial prefect has 45 days to send the report to the Ministry of Interior. Upon signature of the Minister of Interior, the dissolution’s proposal must be approved by the Cabinet (Council of Ministers - *Consiglio dei Ministri*) and the President of the Republic.⁷ Municipalities where the local government is dissolved are therefore those where the mafia infiltration has been attested by the Italian judicial system and confirmed by multiple political institutions. Once the investigation is concluded, the current municipal administration is removed and both the members of the criminal organisation and all the local politicians involved are arrested. Upon the removal of the infiltrated local administration, the central government appoints a team of non-elected, external commissioners, who govern the municipality for a period

⁶D.L. 31/05/1991n.164: gazzettaufficiale.biz/atti/2001/20010223/01A10530.htm

⁷Most of the investigations end up in the dissolution of the city council. Since 2009, when the Ministry of Interior decide to publish information on investigations initiated by the authorities: 70% of them resulted in a dissolution of the city council.

of 12 to 30 months. Since non-elected, the commissioners only take care of the ordinary management. They cannot approve a new budget, nor make any substantial investment (Acconcia, Corsetti and Simonelli, 2014; Galletta, 2017). At the end of the transition period, regular elections are held.

As shown in Figure 1, the large majority of the dissolutions occurred in the three regions which form the main focus of our study: Campania, Calabria, and Sicily. Figure 2 illustrates the number of dissolved municipal governments due to mafia infiltration from the introduction of the law up until 2020. In total, there have been 327 detected cases of mafia infiltration into local governments over this period and 293 of these took place in Calabria, Campania and Sicily.⁸ Figure 2 reports in dark the dissolutions over our period of analysis, 1998 to 2016.

Main reasons behind dissolutions. The capturing of local institutions can be perpetrated in different ways. For an investigation to be initiated, investigators need evidence of alleged connections between the criminal organisations and local governments. The reports of infiltration cases produced by police forces provide anecdotal evidence on this. We leverage on them to identify a set or recurring reasons behind a city council dismissal. As descriptively illustrated in Table B1, in about 27% of the cases elected officials turned out to be organised crime affiliates. For example, this was the case of the municipality of Nardodipace (Calabria), where the investigation revealed “*the presence in the municipal administration, as deputy mayor first and later as councillor, of the son of the local mafioso*”. We label these instances as *direct infiltrations*.

The dissolution reports reveal that, in the majority of cases, criminal organisations do not directly place one of their members within the local government, but they still manage

⁸In recent years few local governments have been dissolved in the North of the country. However, these instances are quite sporadic, particularly when compared to Southern regions. These took place in Piedmont (3), Lombardy (1), Liguria (1), Emilia Romagna (1), Valle d’Aosta (1). Number of dissolutions calculated in April 2021.

to exert a decisive influence on its composition and strategic decisions. These cases are labeled as *indirect infiltrations*. This form of capturing is heterogeneous and it can take a variety of forms. For example, a connection may develop between members of the city council and criminal groups, as in Cinisi (Sicily) where “*it was clear that a councillor was the link between [...] the mafia and the local administration*”⁹, or in Gricignano di Aversa (Campania) where “*the mayor has concluded a pre-election agreement in which he promised future financial benefits to the local camorra clan in exchange for electoral support*”.¹⁰ Another recurrent strategy is constituted by vote buying, as in the case of Seminara (Calabria) where “*the mafia clan’s commitment continued throughout the election through standard vote-buying behaviours*”.¹¹

Finally, while less common, the capturing of local institutions can take place through the use of threats and intimidations. To this regard, Africo (Calabria) was investigated because “*the policy decisions of the municipal council were not made freely and without bias because local politicians were repeatedly intimidated and threatened by criminal organisations*”.¹²

These examples are crucial to exemplify how the infiltration works. It is not simply the physical presence of criminal members within the local government, but also any direct or indirect link between criminal organisations and politicians. Importantly for our study, dissolution reports suggest that the investigations are very rarely triggered by poor municipal performance or anomalies in balance sheets. Appendix B reports additional evidence on Law 164/1991.

⁹Full report available at: gazzettaufficiale.it/eli/id/2001/09/25/01A10531/sg.

¹⁰Full report available at: gazzettaufficiale.it/eli/id/2010/08/21/10A10389/sg

¹¹Full report available at: gazzettaufficiale.it/eli/id/2008/01/31/08A00616/sg

¹²Full report available at: gazzettaufficiale.biz/atti/2014/20140194/14A06583.htm

3 Research design

Identification strategy and estimating sample. Our main sample is composed by the 1350 municipalities of Calabria, Campania and Sicily over the period 1998-2016. The empirical strategy is based on a staggered difference-in-differences (DiD) design that exploits the time and geographical variation of dissolutions over time. Our aim is to identify the period of time during which organised crime was plausibly colluded with the local government. For that, we rely on Law 164/1991, which allows to classify cases of local governments that have been infiltrated by the mafia. That is, we use the dissolution of a municipal government to identify and construct our treatment. A timeline helps to clarify our approach. Figure 3 shows the case of the municipality of Casoria, in the province of Naples (Campania), which has held local elections in 2002. The elected government was later dissolved at the end of 2005. After that, commissioners sent from Rome took over until the following elections, at the beginning of 2008. In the case of Casoria, the treatment period ranges from the election in 2002 to the dissolution in 2005.¹³

The definition of the control group is crucial in this type of designs (Borusyak and Jaravel, 2021). Our control group is composed by never-dissolved local governments and by municipalities having experienced a dissolution, before the infiltration started (i.e. with reference to Figure 3, the period before 2002). For treated municipalities, we exclude from sample all post-dissolution years (in Figure 3, all years after 2005). The reasons is twofold. First, the commissioning years (2005 to 2008 in Figure 3) must be excluded because during this period no investment can be made, since non-elected commissioners can only handle the ordinary management until new elections are held (Acconcia, Corsetti and Simonelli,

¹³While our sample period is 1998-2016, to construct our treatment we collect and use information on the dissolution of local municipalities up to 2020. This is to account for the fact that some of municipalities have been dissolved after 2016 but the treatment years are within our sample period. For example, the municipality of Cropani has been dissolved on the 31st July 2017. However, since the latest election before the dissolution dated 25th May 2014, the years 2015 and 2016 are coded as treated for the municipality of Cropani.

2014). Second, the years after the commissioning period need to be excluded too because such period might be inherently different from the pre-treatment years, precisely as a result of the enforcement of the dissolution policy (Daniele and Geys, 2015; Fenizia and Saggio, 2020).

Our sample period goes from 1998 to 2016. As depicted in Figure 2, there have been many dissolutions before 1998 in Calabria, Campania and Sicily, 94 of which took place before 1998. To avoid any contamination in the control group, in line with the explanation above, the municipalities in which these dissolutions occurred are dropped from the sample. Moreover, some municipalities have been dissolved twice, once pre-1998 and once after 1998. To avoid any post-treatment bias in our control group, these municipalities are dropped too. If municipalities are dissolved twice during our sample period 1998-2016, we keep the infiltration years but use as control only the years before the first infiltration. This means that all the period after the first dissolution is dropped, except the years of the second infiltration.¹⁴ The resulting estimating sample includes 124 treated municipalities.

Matched sample. Despite Calabria, Campania and Sicily are similar regions along many different dimensions, treated and non-treated municipalities might still be different. To take this into account, as an alternative way to construct the control group we follow a matching strategy. We employ a nearest neighbour propensity score matching (Greenaway and Kneller, 2009; Rosenbaum and Rubin, 1983) and pair treated municipalities with the most similar control municipalities across a set of pre-specified characteristics. We match with common support and without replacement, identifying a unique control municipality for each treated one. In performing the matching analysis, all municipalities dissolved before 1998 and municipalities which are coded as treated (i.e. infiltrated) in 1998 are excluded.¹⁵ Table A1 reports the variables used to perform the matching algorithm, em-

¹⁴There have been instances of city council dismissals which have subsequently been revoked. These case are not coded as treated, they are part of our control group.

¹⁵When a municipality is infiltrated only in the year 1998 and then again later in the sample period, we

ploying a set of covariates related to: socio-demographic characteristics, local public expenditure, and geographical features. These are taken at baseline (i.e. 1998), to avoid any post treatment bias. Table A1, reporting the post-matching balancing test between treated and matched control units, demonstrates that for all covariates no significant difference is observed between treated and control municipalities. The matched sample is made of 232 municipalities, half of which experienced infiltrations and dissolutions.

Threats to identification. Our identification strategy needs to account for a number of potential endogeneity issues, determined by the fact that organised crime infiltration within local governments is not random. First, the application of Law 164/1991 may be imperfect. Some municipalities may have been infiltrated but not dissolved because judicial authorities did not detect the collusion. Similarly, some dissolutions may have been done erroneously if there was no real infiltration. As observed by Daniele and Geys (2015, 2016) and Galletta (2017), this should not represent a concern for our estimation strategy as infiltrated municipal governments that are not dissolved would belong to the control group, determining attenuation bias in the empirical results. However, this suggests a word of caution in the interpretation of our results. The likelihood of having some infiltrated municipalities that have not been caught might suggest that we may be measuring the effect of the ‘low-skilled’ mafia organisations, i.e. those that have been detected. We cannot discard this interpretation, which is indeed a limitation of our measure.

Another empirical challenge arises from the possibility that our measure of infiltration correlates with local public finances, our outcome. This may occur through at least two channels. First, if criminal groups decide to infiltrate municipalities exhibiting a particular spending pattern, this would generate a problem of simultaneous causality. To tackle this concern, section 6 shows that infiltrated and non-infiltrated government were on parallel trends with respect to the outcome variables of interest, prior to the election of the infiltrator.

drop the first infiltration (1998) and keep only the second event.

trated government. Second, judicial authorities might start their investigations over risks of infiltration precisely in those municipalities displaying anomalies in their balance sheets. In this case, selection into treatment (i.e. being infiltrated and later dissolved by the national government) would be correlated with the outcome. We minimize this issue in section 6 by showing that our results do not change when we exclude from the sample those municipalities for which the main motive driving the investigation and dissolution was explicitly related to either public spending or revenues collection.

Another potential issue with our empirical setting is that it assumes infiltrations as binary objects, that switch on during the election and off when the government is dissolved. While our hypothesis may be true for many infiltrated municipalities where electoral manipulation brought to power local governments subject to the conditioning of the mafia from the very moment they took office, it may not hold for all of them. Criminal infiltrations can be continuous in time and, as a consequence, be already present in some form before the elections. Statistically, this should generate a contamination in the control group. We empirically test for this by investigating whether any effects of infiltrations are visible in the years preceding the election of dissolved governments.¹⁶ We deal with this issue by estimating event studies and by running a set of placebo tests in section 6.

A final potential concern could arise if the dissolution of municipal governments has been manipulated politically. While we cannot rule this out, we have implemented a set of steps to discard this as a possible bias to our estimates. First, we have tested our results to the exclusion of the year 2012, when Italy was ruled by a technocratic government and an abnormal number of dissolutions have been carried out (Figure 2). Second, a version of the model controls for the political colour of the regional government and that of the provin-

¹⁶It is equally important to check whether the infiltration started *after* the elections. This is something we cannot rule out. Our dynamic panel model provides an overview of the unfolding of the effect across time. Anecdotally, in the majority of the cases, the official documents motivating dissolutions (published by the Ministry of Interior) often indicate the election of the dissolved governments as the key moment when the infiltrations take place.

cial government. This allows to control for any layer of government above municipalities potentially more (or less) likely to be correlated with dissolutions and infiltrations. This is particularly important given that dissolutions are proposed at the provincial level. Another way to control for this is to include in the model province-year fixed effects, accounting for a higher or lower propensity of provinces to be linked with cases of infiltration and dissolution.

4 Data and estimating equation

Data

The paper combines multiple data sources.

Municipal public finance Our primary data source is the Italian Ministry of Interior's Financial Statement Certificates (*Certificati Consuntivi*) database, which contains yearly statistics on a) public spending, b) revenues collection, and c) accounting indicators. This data was collected for all the municipalities of Calabria, Campania, Sicily, Basilicata and Apulia from 1998 to 2016.¹⁷

Public expenditures. We gathered information on total aggregate expenditures, capital expenditures, and current expenditures. Capital and current expenditures are further disaggregated into six specific spending categories, reflecting the services and functions to which the resources have been allocated and spent. They include: general administrative functions, social sectors, construction and waste management, transportation, public education and municipal police. Appendix C reports additional information on each expenditure item.

The *Certificati Consuntivi* report expenditures' decisions made by municipalities during a

¹⁷Data for the year 1998 to 2013 have been received directly from the Ministry of Interior. We have then complemented the dataset for the years 2014,2015 and 2016 with information collected directly from the website of the Ministry of Interior, finanzalocale.interno.gov.it/apps/floc.php/in/cod/4. See Appendix C for more information.

year and it is sub-divided into three categories of spending: spending decisions (*impegni*), year-over-year spending (*conto competenza*) and residuals (*residui*). Spending decisions correspond to the amount of financial resources a municipality approves to spend for the current year. Year-over-year spending is the amount of money the municipal government has actually spent, calculated at the end of the year. Residuals consist of the resources that have been allocated in previous years but not yet spent. Throughout our analysis, we adopt spending decisions as our main measure because our goal is to capture solely the conditioning role of criminal infiltration on the allocation of resources across different expenditures. Moreover, data on residuals and year-over year spending is more fragmented and less reliable.¹⁸

Revenues collection. As explained in Appendix C, Italian municipalities have independence in the collection of two types of taxes: housing property tax and waste tax. Taken together, these taxes cover the majority of total tax revenues. Respectively, they represent 35% and 22% of the total revenues budget. We collect information on housing property tax, waste tax, total taxes and total revenues. For each of these taxes, we then construct measures of efficacy in revenues collection of municipal governments calculated as the ratio between collected revenues and the amount of forecasted revenues the municipality expects to collect within the budget year (Drago, Galbiati and Sobbrino, 2014).¹⁹

Debt and deficit. While data on total municipal debt are not publicly available, we have adopted the total amount of municipal debt towards third parties as a proxy for it.

¹⁸Spending decisions are the finalised official amount of resources allocated for a given expenditure item. This is binding by law (art.183, *Testo Unico Enti Locali*). Year-over-year spending captures the municipal efficiency in actual disbursement of the financial resources allocated. While interesting, this diverge from our main focus and it is not the object of our study.

¹⁹In the Financial Certificates this is the ratio between '*riscossioni conto competenza*' and '*accertamenti*'. Particularly for waste taxes, it is not uncommon that the actual collected revenues, '*riscossioni conto competenza*', is listed as zero directly in the Financial Certificates. We rely on the official data of the Ministry of Interior and, in these cases, the amount of yearly municipal collected revenues reported to the Ministry is zero and our dependent variable reflects that.

Although imperfect and not ideal, this indicator generally correlates with total debt.²⁰ We measure deficit with an indicator equal to 1 if the difference between total revenues and total expenditure is negative.²¹

Local government dissolutions due to mafia infiltration. Information on the dates of local government dissolutions is obtained from the decrees of application of Law 164/1991 from the Presidency of the Republic.²² To construct our treatment over the sample of analysis, 1998-2016, we exploit information on local government dissolutions from 1998 to 2020 (see footnote 13). As described in Section 3, we code as treated the years from the last election before the dismissal of the city council and the date of the dissolution.²³

Local government dissolutions due to other (non-mafia related) reasons. We identify all local governments that have been dissolved for non-mafia related reasons using the Census of Local Italian Administrators, which is a rich dataset including characteristics of local administrations and administrators.²⁴

Control variables. A number of municipal level time-varying characteristics were obtained from the ISTAT Censuses including unemployment rate, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school and high school/tertiary degree holders. The data are drawn from the ISTAT Censuses and interpolated and extrapolated over time. Data on yearly municipal population comes from the *Certificati Consuntivi*. Our control variables are reported (at baseline) in Table A2.

Criminal violence. Data on attacks to local Italian politicians has been extracted from

²⁰We collect information on *residui passivi*, which are defined as the total municipal debt towards third parties. Here a report (in italian) published by the Ministry of Interior: dait.interno.gov.it/documenti/2017_analisi_residui_passivi_2011_2015.pdf

²¹More precisely, deficit is equal to 1 if the difference between revenues and expenditure plus the differences between credits and debt of the municipality (toward third parties) is negative (openbdap.mef.gov.it/Home/AvanziSpendibiliEntiTerritoriali)

²²We use the date of the the decrees of application of Law 164/1991 from the Presidency of the Republic.

²³We use election dates from the website dait.interno.gov.it/elezioni/anagrafe-amministratori.

²⁴Source listed in footnote 23

the Italian NGO *Avviso Pubblico*. On a daily basis, volunteers from *AvvisoPubblico* consult and register news of attacks on Italian politicians and public officers at all levels of government. The information they collect comes either from national/local newspapers or from first-hand sources. Our dataset covers Calabria, Campania and Sicily for the years 2010 to 2017.

Electoral results. We have collected data on municipal election results from 1998 to 2015. The data source for all regions but Sicily is the *Archivio Storico delle Elezioni* of the Ministry of Interior, reporting candidates, parties, and outcomes of local elections of Italy. For Sicily, not included in the dataset, we have used information on local elections reported in the official website of the region. We then used the website on Italian administrators to validate and complement our data.²⁵ Whenever possible, ‘civic lists’ have been manually coded into either centre-left, centre, or centre-right.

Infiltrated firms. The Organised Crime Investigation Group of the Italian Financial Police (*Guardia di Finanza*) collects data on firms which are either under investigation or seized because colluded with organised crime groups. This data is confidential and we have been granted access to the list of municipalities where a firm with proven connections with criminal groups was operating, and which business sector it belongs to. Our dataset has cross-sectional municipal variation and we have constructed an indicator equal to 1 if in a given municipality there has been a firm seized because of criminal infiltration. We do not have firm-level data.

Waste services and public procurement. We have collected data on the number of households served by waste collection and the amount of total waste collected and processed by each municipality in each year from the Financial Statement Certificates, for the period 1998-2015. We also have partial access to public procurement data for a subset of information and only for the period 2000-2012. The main data source is Telemat S.p.a,

²⁵Source listed in footnote 23

a leading information provider in the Italian market for reselling information on public contracts. With that, we have constructed a municipal-level yearly dataset on whether tenders have been auctions and the overall amount of resources auctioned, disaggregated by business sector. These are proprietary data.

Estimating equation

The identification strategy is based on a staggered difference-in-differences design. We study whether criminal infiltrations have an impact on municipal public finances by comparing municipal governments with and without infiltration, before and after such infiltration begins, by estimating various versions of the following baseline model:

$$Y_{m,t} = \alpha + \beta Infiltration_{m,t} + \delta X_{m,1998} * \tau_t + \varphi_m + \tau_t + \varepsilon_{m,t} \quad (1)$$

Where $Y_{m,t}$ refers to public finance outcomes in municipality m in year t . More precisely, $Y_{m,t}$ can be total aggregate spending, capital or current expenditures (disaggregated by components), revenues collection, and debt or deficit.

The key variable in the model is $Infiltration_{m,t}$, a dummy taking value one if the local government is infiltrated by the criminal organisation and zero otherwise.²⁶ The coefficient of interest is β , capturing the impact of the infiltration in year t in municipality m on the local public finances of municipality m at time t .

Vector $X_{m,t}$ denotes a set of control variables. To avoid any post-treatment bias we take controls at baseline (1998) and interact them with year dummies. Controls include: log population, unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders.

²⁶As explained in section 3, this indicator takes value one from the last municipal election to the dissolution of the local government.

The model is completed by municipality dummy variables (ϕ_m), controlling for time-invariant unobservables correlated with the timing of the infiltration, and time fixed effects (τ_t), controlling for year-specific shocks. Finally, $\varepsilon_{m,t}$ is an idiosyncratic error term. Throughout the empirical analysis we cluster standard errors at the municipal level.

The main sample is composed of 1350 municipalities of Calabria, Campania and Sicily over the period 1998 to 2016. Among the robustness analyses, we adopt a restricted (matched) sample composed by 232 municipalities, or an extended sample including municipalities of two additional regions, Apulia and Basilicata (1738 municipalities in total).

5 Estimation results

In this section we present the estimation results. All tables are reported using the same format. Columns (1) present our baseline specification, conditional on municipalities dummies, year dummies and controls at baseline interacted with year fixed effects. In columns (2) we replicate the analysis adopting a matched sample of 232 municipalities, obtained with the methodology described in section 3. In columns (3) we exclude the year 2012, characterised by an abnormally high number of municipal dissolutions.²⁷ To account for heterogeneous trends within provinces, in columns (4) we include province-year fixed effects. Finally, in columns (5) we expand our dataset by including municipalities from two more regions, Apulia and Basilicata.

Total municipal expenditures. We begin by presenting the estimates of the effect of mafia infiltration on *total* municipal expenditure. More precisely, the outcome variables, expressed in logarithm, are respectively total expenditures, capital expenditures and current expenditures per inhabitant ($\log \frac{S_{m,t}}{pop_{m,t}}$, where $S_{m,t}$ is the total/capital/current expenditures

²⁷This allows us to control for any specific characteristics of the year 2012, when a technocratic government was in power in Italy. Moreover in Appendix B, Table B3 excludes all the treated municipalities whose dismissal has been implemented in 2012 and replicate the analysis for our main results.

of municipality m at time t , and $pop_{m,t}$ is population). We compare municipal governments with and without infiltration, before and after such infiltration begins. As explained above, the control group is composed by municipalities that have never been dissolved and by dissolved municipalities before the infiltration begins. The years after the dissolution are excluded.

The results are presented in Table 1, with each outcome in a dedicated panel: total expenditure per capita in panel A, total capital expenditure per capita in panel B, and total current expenditure per capita in panel C. Throughout all the different specifications, the coefficients of the infiltration dummy are quite small in magnitude and not statistically significant. Hence, captured local governments do not seem to exhibit higher total expenditures, neither for public investments (capital expenditures) nor for services and maintenance spending (current expenditures). This result is interesting per se and it might suggest that, unlike generic rent-seeking pressure groups (Tanzi and Davoodi, 1997), when organised crime groups manage to interfere with local government choices they are not interested in affecting the overall level of total spending.²⁸ Rather, they may be interested in affecting the allocation of resources - the *composition* of municipal spending - towards sectors of strategic interest for them. Taking advantage of the disaggregation of the data on public expenditures, this is what we investigate next.

Capital and current expenditures. Table 2 reports estimates for capital expenditures components, while Table 3 focuses on current expenditures. Each table has 6 panels representing the main budget items of Italian municipalities. In Table 2 each spending item is measured as a share of total annual capital expenditures, while in Table 3 each component is normalised by total annual current expenditures.

²⁸Our findings differ from those of Olivieri and Sberna (2014), reporting a positive relationship between pre-electoral mafia violence and total public investment in local municipalities in Southern Italy. The difference may be due to the fact that we do not focus on violent attacks on the part of organised crime, but on criminal infiltration within politics.

We begin by focusing on capital expenditures as outcome variables in Table 2. A key result emerging from this analysis concerns municipal expenditure allocated for ‘construction and waste management’ during infiltration periods. Panel C, Table 2 shows that infiltrated local governments significantly increase spending in this sector. With an estimated coefficient of 0.0489 (column 1, panel C) the effect is economically significant, as this implies that infiltrated administrations increase the resourced dedicated for construction and waste management by 14%. The result remains stable when exploiting our matched sample, when dropping the year 2012, with the inclusion of province-year fixed effects, and when expanding the dataset to Apulia and Basilicata. We discuss the magnitude and the interpretation of this finding in the next subsection.

When looking at the results for the other sectors, we also observe a reduction in the amount of resources dedicated to ‘transports and public lighting’ (panel D). The coefficient is always negative, but insignificant in the baseline model and when excluding 2012. No other significant variation of capital expenditures is observed in other sectors: administration, social sector, education, and police.

When we turn our attention to current expenditures (Table 3), most of the spending items display insignificant coefficients with the exception of spending in administration (Panel A). In that case, we observe a negative coefficient across specifications, albeit small in magnitude. These results are not extremely robust, as the coefficient loses significance when we expand the dataset to Apulia and Basilicata.²⁹

Taken together, the results emerging from the estimates illustrated in Tables 1, 2, and 3 seem to indicate that organised crime groups capture local governments to bias the al-

²⁹Given that we are performing multiple hypothesis tests for several outcomes, one may worry that the obtained results are ‘false-positive’. In table A3, we decrease the number of tests by aggregating together capital and current expenditures for each spending component and expressing them as share of total spending. Across all specifications, the results for construction and waste management and public transport and lighting are confirmed. This is not the case for expenditures in administration, which is not surprising given the size of its coefficients in Table 3.

location of public resources towards sectors which are of strategic interest for them. We provide a more comprehensive interpretation of these results in the next sub-section.

Local revenues collection. We now turn to whether the capturing of local government has an impact on the ability of the local governments to collect *revenues*. Given the high degree of devolution of powers to sub-national authorities of the Italian State, municipalities are expected to maintain a certain level of independence and autonomy in collecting their own financial resources. As discussed in Appendix C, local taxes represent an important source of income for municipalities (IFEL, 2014).

Our dependent variables are measures of efficacy in revenues collection calculated as the ratio between actually collected revenues and forecasted revenues a municipality expects to collect. We focus on the two main local taxes, property tax and waste tax, and on total taxes and total collected revenues. Property tax and waste tax represent the main source of income in the municipal budget. Total taxes represents the total fiscal inflows of a municipality. Total revenues represents the overall amount of revenues a municipality receives, including all transfers from a multiplicity of sources such as the region, the National Government, or the European Union.

We present our findings for each dependent variable in a dedicated panel of Table 4. To begin with, it can be noted that the coefficient of infiltration on property tax is always insignificant, while on waste tax it is negative and statistically significant across specifications. The estimated effect is economically sizeable. In the baseline model, infiltrated municipalities exhibit a reduction of approximately 20% in our outcome variable, which is defined as the amount of collected revenues divided by the forecasted revenues on a yearly basis. The coefficient remains negative but loses significance in column 4 when we include province-year fixed effects. When we turn our attention to total taxes (panel C), we observe a negative coefficients across specifications, which is significant in our matched sample and when including province-year fixed effects, but only barely when excluding 2012. When

looking at the combination of results for property tax (panel A), waste tax (panel B) and total taxes (panel C), it appears that municipalities infiltrated by criminal organisations are characterised by a lower efficacy in collecting fiscal revenues, a result which seems to be driven by a reduction in the ability in collecting waste taxes.

The same evidence is not present in panel D, when we look at total revenues. This may be due to the fact that part of the total annual revenues of Italian municipalities is composed by regional and national transfers, which would partially offset the loss induced by the decrease in fiscal revenues if, as claimed by Barone and Narciso (2015), municipalities with a strong presence of criminal organisations manage to attract more funds from the central government.

Municipal debt and deficit. To conclude, we turn our attention to municipal debt and deficit. As data on total municipal public debt at the yearly level are not available, to proxy for it we adopt debt towards third parties, one of the most important components of total municipal debt reflecting all the outstanding money municipalities have to disburse to their creditors. Debt is measured in two ways. First, by using the total level of yearly debt towards third parties listed in the municipal budget ('total debt'). Second, following Coviello et al. (2021), as share of the total revenues of a municipality ('total debt/total revenues'). To measure municipal deficit, we create an indicator equal to 1 if the difference between total revenues and total expenses is negative.

Table 5 reports the results, described in dedicated panels for each of the three dependent variables. An interesting finding emerging from this analysis is that infiltrated local governments exhibit a higher value of total debt towards third parties, as compared to non-infiltrated local governments. The coefficient of total debt is relatively stable across specifications (panel A), though it loses significance when using our matched sample. However, when we express this as share of total revenues (panel B), the coefficient is not significant. Finally, the analysis in panel C reveals that infiltrated administrations are not more likely

than control municipalities to run yearly budget deficits. This may represent a deliberate strategy to avoid attracting external attention.

Interpretation of the results

The evidence reported in the previous section suggests that captured local governments do not increase aggregate public spending, but rather they affect the composition of the spending budget by redirecting resources towards sectors of strategic interest for them. In particular, two main findings emerge as strong and robust across all our specifications. First, captured local governments allocate more resources on construction and waste management and, second, they exhibit a reduction in how effective they are in collecting waste tax. We provide a more extensive interpretation of these two results below.

Construction and waste management. According to the estimates in Table 2, infiltrated governments increase capital expenditure on construction and waste management. An estimated coefficient of 0.0489 (Column 1, Panel C) implies that infiltrated local governments increase the allocation of resources dedicated to construction and waste management by approximately 14%, compared to the average spending for the same item in non-treated municipalities (equal to 0.34). This is a relatively large figure if we consider that functions related to construction and waste management already account for the largest part of the capital account budget (Table A2).

This particular spending item (called "Territorio e Ambiente" in the "Certificati Con-suntivi") includes all expenses allocated to waste collection and the construction of buildings, urban planning as well as the management and the maintenance of the local territory. Investing in this sector represents a strategic decision for criminal organisations for many reasons. First, criminal groups need to find an outlet for profits obtained from illegal activities and the construction sector represents an easy and highly profitable option for money

laundering. This is not just because of the financial returns that this sector might generate, but also because technological and financial barriers to entry are relatively low, making this an ideal area for long-term investment (Dipoppa, 2021).

Second, the area of construction and waste management is associated with a set of activities that are deeply embedded within the local territory (De Feo and De Luca, 2017). Seizing control of these activities is crucial for the mafia, so as to establish and expand a wide network of relationships, allowing the latter not only to survive, but to prosper. The construction of new buildings and the collection of waste involve many agents: political leaders in charge of awarding public work tenders, contractor enterprises responsible for delivering the project, and a labour pool to carry out the work. Members of organised crime groups may be involved at all levels of this chain, and very similarly to the most traditional interest groups, they exploit the political connections they have in order to rig public work bids to the advantage of the enterprises they control, or intend to favour.

Mafias invest in local firms and, in order to generate profits, they need investment opportunities and public funding. To provide empirical evidence of this we have gained partial access to proprietary public procurement data at the municipal level from 2000 to 2012. More precisely, we know the total amount of money tendered out in a municipality in a given year, and its disaggregation by sector.³⁰ We have focused on the following sectors: roads, building, waste, services, arts and culture and a residual sector which include a set of minor procurement contracts. Procurement on construction and waste management have been grouped together, as the sum of the starting values of the tenders for buildings and waste management. Then, a set of outcome variables have been created representing the money tendered out via public procurement by different business sectors as share of the total. We then investigate whether, conditional on having a public tender, infiltrated local

³⁰Unfortunately, only have a very partial access to TELEMAT dataset. We do not have information such as the typology of the selection procedure, the winning rebate, and the number of the bidding firms.

governments exhibit a different pattern than non-infiltrated local government, before and after the infiltration begins. The analysis exploits all municipalities with at least an auction of Calabria, Campania and Sicily from 2000 to 2012 and it is presented in Table A4. The estimates reveal that, conditional on having a tender, infiltrated local governments allocate more resources to tenders in the sector of construction and waste management.

This may be an indication of a precise *modus operandi* adopted by criminal organisations and colluded local administrators. The capturing of local governments facilitates the re-allocation of resources towards sectors of strategic interest for criminal groups, such as construction and waste management, and the implementation of public procurement tenders making these resources available to private enterprises. This in turn might enable criminal organisations to provide business opportunities to their controlled firms as well as re-invest the liquidity generated from illicit activities and, more broadly, strengthen their control over the local territory by offering employment opportunities to citizens. Unfortunately, we do not have access to a panel data on infiltrated firms to empirically test for this. However, to provide an initial descriptive evidence of such mechanism by exploiting cross-sectional information on cities with registered mafia-controlled firms that have been seized by the Italian Financial Guards. Table A5 shows a positive correlation between local governments that have been dissolved because of criminal infiltration and the presence of seized firms in the same municipalities. A report by Transcrime on organised crime's investment in the legal economy shows that approximately 29% of the firms seized because of connections with criminal organisations were operating in the construction sector (Transcrime, 2017).

Waste tax. Table 4 (panel B) shows a statistically significant reduction in the efficacy of waste tax collection of infiltrated municipalities. This result, alongside that of a significant increase in spending for waste management discussed above, seems to confirm the well-

documented presence of criminal organisations in the waste collection sector.³¹

The observed link between waste tax collection and mafia infiltrations can have at least two (non-mutually exclusive) explanations. On the one hand, it may point to a lower administrative and revenue-collection capacity of local governments during infiltration periods. On the other hand, this evidence may indicate a lower willingness to pay waste taxes by citizens, when infiltrations are in place.³²

The former interpretation would essentially relate the observed dynamic to generalised inefficiencies of the local public administration during corruption or collusion periods, in line with what suggested by Daniele and Dipoppa (2017). While this is indeed a possibility, such interpretation is at odds with the fact that we do not observe a significant reduction in the collection's ability of property taxes by infiltrated municipalities. We do find some evidence of a general decrease in fiscal revenues during infiltrations, but these seem to be mostly driven by waste taxes. Furthermore, the result of the placebo test reported in section 7 shows that municipalities characterised by non-mafia related administrative inefficiencies (such as failure to approve the budget, political instability, absenteeism) do not display any significant link with waste tax collection capacity. In light of this, it seems more likely that the lower efficacy in waste tax collection is specific to infiltrated local governments, and directly related to the dynamics induced by the capturing of politicians from criminal organisations.

³¹The connection between the waste hauling industry and organised crime dates back decades. In the U.S., *Cosa Nostra* has been part of New York's commercial sanitation system since at least the 1950s (personal trash is hauled by the city Department of Sanitation). "Carters", or trash haulers, have always been able to carve out and sell routes to one another, making the system vulnerable to strong-arm tactics. The *camorra* is said to have controlled garbage in the city of Naples since the early 1980s. The poorly run system attracted worldwide attention when, back in 2008, uncollected garbage piled up on the city's streets for more than two weeks because the Mafia had closed the dumps.

³²While more convoluted, a third explanation looks at the increase in resources allocated to construction and waste management and a decrease in the efficacy in collecting waste taxes as a criminal strategy. When taxes are lower the costs of producing waste are lower. This might lead to an increase of the production of waste which might be in line with the incentives of criminal organisations, since it would require more investments in waste collection and processing.

This links with the latter interpretation, pointing to the fact that citizens may be less willing to pay waste taxes if waste is managed by local administrations directly connected with criminal groups. As suggested by the evidence on public procurement discussed above, infiltrations may increase the probability that waste management is contracted to mafia-controlled companies, exploiting the infiltration precisely to make profit out of it. However, the increase in spending for waste management by these local governments may not necessarily translate into a higher quality of the waste collection service, quite the opposite. Mafia-contracted waste management firms may entail a higher number of environmental crimes, which are indeed a common problem of Campania, Calabria, and Sicily.³³ Therefore, citizens may feel entitled to avoid paying it if waste collection is managed by organised crime and the quality of the waste processing service is low.³⁴

In order to provide some initial descriptive evidence on this, we have collected data from the Financial Certificates on the number of households served by municipal waste collection and the yearly amount (tons) of waste collected and processed by the municipal governments Daniele and Giommoni (2020). The data, available from 1998 to 2015, was extracted for municipalities of Campania, Calabria, and Sicily. We have normalised these indicators by the number of inhabitants and used them as dependent variables (expressed in logarithm) in our model, testing for a link with infiltration. While these variables have a large number of non-recorded observations which we coded as missing, they can be used to provide some preliminary and very descriptive evidence on the characteristics of waste collection services during infiltrations.

³³A recent report published by *Legambiente* and the Italian anti-mafia directorate show that our 3 regions of interest, Campania, Sicily and Calabria, are respectively ranked 1st, 2nd and 3th in terms of environmental crimes in Italy, with 44.4% of the total crimes detected. The Italian anti-mafia unit has measured the criminal business gravitating around waste management at 19.9 billions only in 2019. The report can be found at legambiente.it/comunicati-stampa/i-dati-del-rapporto-ecomafia-2020-nel-2019-in-aumento-i-reati-contro-lambiente/

³⁴This is particularly likely in these 3 regions where tax evasion of the waste tax is more of a problem than in the rest of Italy.

Table A6 shows the results of this exercise. It is interesting to note that in spite of the fact that infiltrated local governments are characterised by higher spending for waste management, they do not seem to exhibit better waste collection capacity than control municipalities. The coefficients are negative, potentially in line with the idea of a worse services during infiltration. The coefficients are however not statistically significant and therefore this analyses is suggestive in its nature and should be therefore taken with a grain of salt. Additional evidence on the waste collection capacity of mafia-rigged municipalities is provided by D'Amato, Mazzanti and Nicolli (2015), estimating that Italian provinces characterised by the presence of infiltrated municipalities display lower waste collection capacity, and concluding that organised crime within local municipalities represents a strong obstacle to achieving better waste management performance.

The dataset on local waste services also provides descriptive information on the waste collection provider (consortium, private firm, municipality-controlled firm, public entities, PPP, unknown) used by a given municipality in given years. Exploiting this descriptive information it is possible to see that, in infiltrated local governments, in 24% of the cases the providers are listed as unknown, a statistically higher number than in non-infiltrated local governments. In such a context, both a lack of institutional trust and low quality of the service might reduce the incentives to pay the municipal waste tax.

Other results. When looking at the effect of criminal capturing on capital expenditure in Table 2, we also find some evidence of a decrease in the amount of investments allocated for transport and public lighting. Investments in this chapter of the balance sheet includes expenditures for local public transportation (e.g. school buses), public lighting, as well as any improvements in the management of road traffic. Reducing the amount of resourced devoted to this expenditure may be instrumental to increase resources towards sectors of more strategic importance, such as construction and waste management, without causing an increase in the overall amount of public expenditure. Investments in transports and public

lighting have little (if any) connections with the main activities of criminal organisations. Moreover, a reduction in capital investment in public transport and lighting may not be perceived by the municipal residents in the short term. Hence, this might avoid the risk of electoral backlashes.

Table 3 reveals that captured municipalities are associated with a lower amount of current expenditures for the administration budget item. Under this heading, Italian municipalities record all current expenditures for municipal personnel and for the *ufficio tecnico*, i.e. the office responsible for overseeing all municipal expenditures and public procurement. This result should be taken with caution, as the coefficient is only weakly significant and quite small in magnitude across specifications. Moreover, the negative effect seems to be mostly driven by the presence of an upper trend in the legislature before the infiltration (Figure A1, panel (d)). Finally, the coefficients in panel A of Table 5 seem to suggest that infiltrated municipalities exhibit a higher level of total debt. This finding should also be taken with a grain of salt, given that debt is imperfectly measured. Furthermore, while we see a statistically significant increase in the total level of debt in panel A, the result loses significance when we normalise debt by total revenues in panel B.

6 Exogeneity checks

In this section, we present a set of tests of the robustness of our design and our estimates. We mainly focus on our two main results, i.e. an increase of capital expenditure allocated for construction and waste management and a decrease in the efficacy of waste tax collection during infiltration periods. However, all the exogeneity and robustness checks are also performed for all other outcomes for which we have found some statistically significant evidence in any of our specifications (Table A15).

Infiltration period starts with the elections. As discussed in section 3, the starting

assumption of our identification strategy is that the period of infiltration begins at the moment of the election of later-dissolved governments and ends with the dissolution. We test the validity of this assumption in Table 6, where we perform a number of placebo experiments exploiting data on the length and characteristics of municipal legislatures. In columns (1) and (4) we report the baseline estimates for our two main dependent variables, capital spending for construction and waste management and waste tax, as also expressed in Tables 2 and 4. We then perform two placebo exercises.

In the first one we identify all municipalities whose treatment period coincides with the second consecutive term of the mayor. In other words, the same mayor administering the infiltrated (and dissolved) government was in charge during the previous term. One concern could be that the infiltration, and the distortion of public finances, started before the beginning of the legislature, during the first mayoral term. To check if this is the case, when the infiltration period coincides with the second term of the mayor, we drop from the sample the years corresponding to the first mayoral term. We report the estimates of this exercise in columns (2) and (5) of Table 6. The results are reassuring in that both the estimate for construction and waste management and waste tax remain stable and unaffected by the exclusion of all the years of the first mayoral term.

If significant variations in local public finances were taking place in the period preceding infiltrations, the decision to infiltrate a government might be taken as a result of these variations. This would occur if the criminal organisations were selecting municipalities where to extract rents on the basis of pre-determined variations in public expenditures or local taxes, made by governments with no links with organised crime. If this was the case, public finance decisions would be the cause, not the consequence, of infiltrations. To take this into account, our second placebo verifies the local finances of the governments immediately preceding those dissolved for mafia infiltration. In columns (3) and (6) of Table 6, we drop the *infiltration* dummy and introduce a variable capturing to the municipal

legislature immediately preceding the infiltration period. ‘Prior legislature’ is a dummy variable equal to 1 for each year of the the legislature before the infiltration.³⁵ We then run our analysis with this as main explanatory variable and, in order to avoid contamination in the control group, dropping from the sample the treatment years. We expect to find no significant correlation between pre-infiltration governments and any form of public spending or revenue collection distortion. Reassuringly, for both our outcomes, the coefficients of ‘prior legislature’ do not exhibit any statistical significance.

Although we cannot reject with full certainty the possibility that infiltrations begin before elections, the results of our placebo test seem to follow the theoretical framework of Dal Bó, Dal Bó and Di Tella (2006), according to which elections constitute a “recruitment process” whereby a new bargaining table between crime and politics is established. This might particularly be true in Southern Italy where the political turnover is very high: 71% of local administrators leave local politics within 5 years and 93% within 10 years (Daniele and Geys, 2015). In this context, elections are crucial because they can constitute a turning point whereby the “criminal interest groups” select the political counter-parties that best suit their interests (Wolton, 2016). Hence, the difference in all the coefficients from columns (1) and (4) to columns (3) and (6) in Table 6 might be explained as a newly renovated agreement between mafia members and politicians which in turn leads to a distortion in the allocation of public resources and revenue collection.

Parallel trend - full dynamic specification. Our staggered difference-in-differences lends itself to a test of causality in the spirit of Granger (Angrist and Pischke, 2008), which allows to verify the parallel trend assumption and to analyse the year-by-year evolution of our main results. We perform event studies to check whether there is any statistically

³⁵The number of years observed in the data for the previous legislature depends on the year in which the previous legislation begins. If, for instance, the election of the infiltrated government was in 2000, we will forcibly have information on the previous legislature for two years only (1998-1999), due to the start of our dataset in 1998. This is however relatively uncommon as the average length of observed prior legislatures is 4.3 years.

significant difference between infiltrated and non-infiltrated municipalities before the infiltration takes place. In order to do this, a set of dummy variables is created for each and every year of the treatment period, i.e. the period from the governments' election to their dissolution. Similar dummy variables are also constructed for pre-treatment years.

Formally, we estimate the following equation:

$$Y_{m,t} = \alpha_m + \theta_{p,t} + \sum_{\lambda=1}^p \beta_{-\lambda} Infiltration_{m,t-\lambda} + \sum_{\lambda=0}^q \beta_{+\lambda} Infiltration_{m,t+\lambda} + \varepsilon_{m,t} \quad (2)$$

Where $Infiltration_m$ is an indicator equal to one if municipality m is infiltrated, q represents the post-infiltration effect and p represents the anticipatory effect. We estimate this dynamic model including this set of leads and lags and controlling for municipal fixed effect, year fixed effects and province-year fixed effects $\theta_{p,t}$. The omitted category is the year before the election of a later-dissolved government (*ly prior*). We perform this test on both our main sample of municipality of Campania, Calabria, and Sicily and on a larger sample including municipalities of Apulia and Basilicata. As in our main model, post-dissolution years (including the commissioning period) are excluded and all municipalities dissolved before 1998 are dropped from the sample. In addition, we also exclude local governments infiltrated in 1998, for which we would not have any pre-treatment period, and municipalities having experienced two or more dissolutions during our sample period.³⁶

Figure 4 displays the result of the analysis for our two main outcomes, capital spending for construction and waste management, and waste tax. We assess the evolution of municipal spending up to 5 years *before* the election of an infiltrated government and 2 years *after* the election. Each point in the figure refers to the estimated coefficient for a given year. We

³⁶We drop municipalities with two or more occurrences of infiltration because in these instances the pre-trends for the second dissolution would suffer from post (first) treatment bias, making the event study less rigorous and reliable

limited the post period at 2 years after the elections because the average infiltration period is 2.7 years and we want to keep a balanced window.

Importantly, both for expenditures in construction and waste management and for waste tax, the estimates reveal no statistical difference between control and treatment group in the pre-infiltration period. The 5 pre-treatment years show that, before the infiltrated governments, there is limited and not significant variation for both outcomes, relative to control municipalities. The same pattern is detectable when looking at the expanded sample, including Apulia and Basilicata. This is providing reassuring evidence on the parallel trend assumption.³⁷

Panels (a) and (c) of Figure 4 show an increase in resources for construction and waste management in the first and second year after municipal elections (i.e. second and third year of legislature). Panels (b) and (d), focusing on waste taxes as dependent variable, also display a variation in infiltrated vis-à-vis non-infiltrated municipalities in the first and second year after the election of the infiltrated government.

In Figure A1, we replicate the analysis for all other outcome variables displaying statistically significant links with infiltration in any of the specifications in Tables 2-5: current spending for administration, capital spending for transport and lighting, total revenues, municipal debt. Current expenditure for administration is the only expenditure item that seems to reveal some statistical difference between treatment and control group before the beginning of the infiltration. This might suggest that the coefficients in Table 3 are driven by an upper trend in the pre-period rather than being a consequence of the criminal infiltration and, for this reason, we do not consider it as a robust result.

For all other results, Figure A1 does not seem to reveal any statistically significant difference between control and treatment group. However, the size of the coefficients of

³⁷The magnitude of the coefficients in the post treatment period is different than those of the DiD main estimates because, as described above, we are exploiting a different sample, i.e. municipalities dissolved only once.

the 5 pre periods are more volatile and unstable. This makes these results less strong than those presented in Figure 4 and for this reason we are more cautious in interpreting them. Figure A1 also reports event studies for all the other expenditure items of the municipal budget, even if for them no significant link with infiltration was found. We do not observe any presence of statistical difference between treatment and control municipalities before the beginning of the infiltration.³⁸

Bacon decomposition. When there is variation in the timing of the treatment, and the effects are dynamic, the estimated coefficient represents a weighted average of these dynamic effects and some of the weights can be negative (Goodman-Bacon, 2021; Chaisemartin and D’Haultfoeuille, 2020). This is because the “control group” in some of the two-by-two comparisons may be treated in both period. To explore whether this issue is at play, we compute the number of negative weights in our setting and the type of comparisons they refer to. More precisely, as a diagnostic test, we implement a Bacon decomposition Goodman-Bacon (2021) for each of our main results. In Figure A2, we report the results and show that the negative weights problem should be limited in our empirical setting since the comparison receiving the highest weight is between treated units versus never treated units.³⁹

Test for selection into treatment correlated with outcome variable. Our results indicate that infiltrated local governments spend on average more on construction and waste management and are less effective in collecting waste taxes. One concern, however, is that judicial investigators might choose to investigate precisely those municipalities that present anomalies in their balance sheets. If this is the case, the selection into treatment would be

³⁸The unique exception is a marginally significant coefficient for total expenditure in social services (panel i), but only in period t-1.

³⁹We also computed the diagnostic of (Chaisemartin and D’Haultfoeuille, 2020), *twowayfeweights*. Under the common trend assumption, the beta estimates for construction and waste management is a weighted sum of 345ATTs, with 335ATTs receiving a positive weight and 10 a negative weight. For waste tax, out of a weighted sum of 292ATTs, 281 receive positive weights and 10 negative weight.

correlated with the dependent variable, inducing bias in our estimates.

In order to tackle this issue, we reproduced our analysis excluding from the sample all those municipalities for which the main reason for dissolution was explicitly reported to be associated with anomalies in the balance sheets.⁴⁰ Table A7 reports the results, shown for all our key outcomes.

Columns 1-3 focus on capital expenditures in construction and waste management, columns 3-6 provide points estimate for waste tax and total taxes, respectively. Even when dropping from sample municipalities characterised by this type of mafia dissolutions, the coefficients of the treatment dummy are very similar in magnitude with respect to our main analysis reported in section 5. While we cannot rule out the possibility that some investigations started because of anomalies in the balance sheets, this exercise is reassuring, in that it suggests that excluding those municipalities whose dissolution was explicitly motivated by oddities in the expenditure levels does not affect our results in any significant way. In Table A15, we perform the same exercise for our additional results.

7 Robustness checks

In the previous section we provided some fundamental tests for our identification strategy. In this section, we perform a number of additional robustness tests might affect the empirical results. In doing so, we focus and comment mostly on our two main results, increase in capital expenditure allocation for construction and waste management and a reduction

⁴⁰To perform this test, we exploit official statements on the dissolutions. These documents contain descriptions not only of the final reason for the dissolution, but also some information on why the investigation started in the very first place. We exclude from our sample all the municipalities for which a) the investigation started and/or b) the reason for the dissolution was explicitly reported to be associated with spending related distortions. To the extent that the reasons behind the beginning of an investigation are not always evident and clearly distinguishable, the analysis is subject to measurement error.

in the ability to collect waste taxes.⁴¹

Placebo test: mafia-unrelated dissolutions. A concern related to the changes in the public finances of infiltrated governments is that, rather than being caused by the mafia, they are driven by some inherent characteristics of local governments such as inefficiencies of the public administration, mismanagement, or low quality of the local administrators. In order to test for this, we exploit the fact that in Italy local legislatures can be interrupted for reasons entirely unrelated to mafia infiltrations, including: failure to approve the financial budget, resignation of the mayor, resignation of more than 50% of the council members, vote of no confidence. This type of events are indubitably a bad outcome for a newly-elected local government, because if a government is dissolved the elected politicians cannot run again in the following election. Thus, politicians have every incentive to avoid this scenario. Yet, these dissolutions are relatively common in our sample and time-span - in the period from 1998 to 2016 there were 439 cases of non-mafia related early terminations of municipal legislatures within the three regions of analysis. We use these instances as proxies for unstable governments and for low quality of elected politicians. As a robustness, we then test whether our main results were driven by these characteristics of inefficient local governments, rather than by criminal infiltrations. We replicate the estimates of model (1) using ‘Mafia-unrelated dissolution’ as the main explanatory variable, a dummy taking value 1 for all the years from the election of the local government to its early termination for non mafia related reasons.

The results of this placebo test for our main outcome variables are presented in Table A8. We compare local governments dismissals for non-mafia related reasons with non-dissolved governments, before and after the dismissal takes place, using the sample of municipalities of Calabria, Campania and Sicily and excluding from sample all local

⁴¹Table A15 replicates these tests for all other public finance items related with infiltration: current spending for administration, capital spending for transport and lighting, total revenues, municipal debt.

governments dissolved for criminal infiltration. Columns 1 and 3 replicate our baseline specification. In columns 2 and 4 we include province-year fixed effects. There are no statistically significant coefficients, suggesting that our main results do not seem to be driven by other non-mafia related factors such as inefficiencies in the public administration. Table A9 reports the results of this exercise for all other outcomes.

Political business cycle. A legitimate concern is that our findings might be confounded by political business cycles. We tackle this issue non-parametrically by creating an election-year variable which represents the count for each year of each legislature. We then replicate our main analysis including a set of dummy variables that take value 1 for each election-year. Table A10 report estimates of our baseline model including election year dummies (columns 1 and 4), we then drop from sample the year 2012 (columns 2 and 5) and add province-year fixed effects (columns 3 and 6). Our main findings remain stable across specifications with the only exception of waste, when including province-year FEs.

Test for spillover effects. Previous research has demonstrated that municipalities neighbouring those dissolved for mafia infiltration tend to respond to their neighbours' dissolution by reducing the overall level of public investment (Galletta, 2017; Tulli, 2019). If some municipalities artificially lower their spending as a response of the dissolution of a neighbouring municipality, our control group may be biased and so would be our results. In order to discard the possibility that the findings are driven by such spillover mechanism, we replicate our estimates by excluding from sample all municipalities located in the vicinity of those dissolved for mafia infiltration at any moment during the 1998-2016 period. Geographical proximity is defined in three different ways. The first definition considers as neighbours of dissolved municipalities all those municipalities sharing a border with them during the sample period. In such a way, 244 municipalities of Campania, Calabria, and Sicily are dropped. The two other definitions of proximity are based on distance. Neighbouring municipalities are considered as those within 1km or 5km from dissolved ones.

This entails dropping 266 municipalities from our sample of three regions in the former case, and 413 in the latter case.

The results are displayed in Table A11. The coefficient of total capital expenditures is slightly larger than that of Table 1. This might suggest that, on average, municipalities which are neighbours of dissolved local governments tend to exhibit a decrease in public spending. Yet, as in Table 1, the coefficient of the treatment dummy is not statistically different from zero, indicating that total capital expenditures during infiltrations is not significantly different from non-infiltrated periods. Our key results remain unaffected by the exclusion of neighbouring municipalities.

Attacks to politicians. Next, we test for the relationship between mafia violence and criminal infiltration. To do so, we adopt municipal level data on violent attacks against local politicians and administrators perpetrated by organised crime groups.⁴² We merge this information with our data and obtain a sample composed by the municipalities of Calabria, Campania and Sicily over the period 2010-2016. We then create a dummy variable, ‘Attacks to politicians’ which takes value 1 if there has been violence against local administrators in a given municipality.⁴³

We then regress this measure on our standard infiltration variable. The results, reported in Table A12, indicate that there is no statistical correlation between the capturing of local politicians and mafias’ attacks against them. In column 2, we also test whether there is any violence against politicians in the year before the infiltration to the municipal council, finding no evidence of it. While one may expect that criminal infiltrations give rise to an increase in violent activities - as criminal groups may impose their will to administrators

⁴²The dataset is constructed using information collected by Avviso Pubblico, an Italian NGO that systematically record news of attacks to local Italian politicians. The data covers the years 2010-2017. As studied by Daniele and Dipoppa (2017) the violence targeted at politicians is not sporadic. From 2010 to 2017 there were, on average, 301 attacks against Italian politicians.

⁴³We are not exploiting the intensity of the attacks in this analysis. In some municipalities attacks are more than in others and they are different in typology (from threatening letters to murders).

through violent means - engaging in violent behaviour when infiltrated may be counter-productive for mafia organisations, because it may undermine their potential to bias the allocation of public resources. In Table A13, we run our main specification (equation 1), but measuring organised crime presence using incidents of attacks to politicians and excluding municipalities dissolved for criminal infiltration. Results show that these episodes of violence against local administrators seem to be uncorrelated with the spending components that, on the opposite, are affected by the criminal infiltration in local councils.

Organised crime and politics. A legitimate question is whether our results are truly driven by criminal infiltration or, simply by some unobserved political characteristics. To address this issue, we augment our dataset with information on local election results and local political characteristics of all municipalities of Calabria, Campania and Sicily from 1998 to 2016.⁴⁴ Our primary data sources for political variables are the Historical Archive of Local Elections of the Italian Ministry of Interior and the database on local administrators, also available from the Ministry of Interior.

To test for the possibility that our main results are bias by some omitted political variables correlated both with infiltrations and with local public finances, we replicate our main model controlling for key political elements potentially linked with infiltrations, by estimating:

$$Y_{m,t} = \alpha + \beta Infiltration_{m,t} + \gamma P_{m,t} + \xi G_{r,t} + \psi G_{p,t} + \vartheta X_{m,1998} * \tau_t + \phi_m + \tau_t + \varepsilon_{m,t} \quad (3)$$

$P_{m,t}$ is sub-divided into a set of variables referring to key political features of the local government. First, we focus on (lack of) electoral competition (Schleiter and Voznaya, 2014), and in particular on the cases where there is only one candidate potentially eligible

⁴⁴It is relatively common that local municipal elections in Italy are won by civic lists. In order to not lose these instances, we have manually coded them into the three party categories - centre right, centre left, centre party - by exploiting information on the political party affiliation of the civic list mayoral candidates.

for mayor because no other electoral lists were presented (variable ‘single candidate’).⁴⁵ Second, to minimise the risk that our results are driven by binding term limits affecting the behaviour of politicians (Besley and Case, 2003; List and Sturm, 2006; Alt, Bueno de Mesquita and Rose, 2011; Ferraz and Finan, 2011) we exploit the fact that up until 2014 all mayors had a term limit of two mandates, and control for the variable ‘last mandate’.⁴⁶ Third, infiltrations may be systematically correlated with the political colour of the local, provincial, or regional government.⁴⁷ We include in the model dummy variables referring to whether the municipal government is ruled by centre-left or centre-right parties. Finally, $G_{r,t}$ and $G_{p,t}$ are dummy variables taking value one if the regional or provincial governments, respectively, are ruled by left-wing parties. These two controls can be included only if the model is estimated without province-year fixed effects.

The results, displayed in Table A14, show that the coefficients for our two main results remain remarkably similar and significant even when controlling for key political factors. This analysis provides reassuring evidence that the documented variations in capital expenditures for construction and waste management and waste tax in captured local governments were not confounded by omitted political characteristics potentially correlated with the infiltration.

8 Conclusion

Collusion and corruption distort the correct functioning of democratic systems. Illegal and secretive agreements between elected officials and colluding parties may alter the legisla-

⁴⁵In such cases, the only condition necessary to valid the election is a voter turnout above 50%.

⁴⁶While mayors can run for a third term after a term break, third-term candidacies are rare. We drop these instances from the sample.

⁴⁷Recent evidence has shown that the mafia sells votes to the party that has more core supporters and it is therefore expected to win (De Feo and De Luca, 2017). In Sicily, the strongest political relationships developed by the mafia have been with the Christian Democrats (*Democrazia Cristiana*, DC) and then after the DC’s demise in 1994, with the party Forza Italia (Buonanno, Vanin and Prarolo, 2016).

tive process, compromising the definition of policies aimed at the welfare of citizens. In this paper, we have focused on the cases of collusion between organised crime and local politicians in Southern Italy, analysing the way in which these may distort local government decisions on matters of public finance.

The findings indicate that collusions between organised crime and politicians affects the allocation of public resources and the ability of local governments to collect fiscal revenues. Our analysis suggests that while the overall allocation of financial resources of local governments remains unaltered, the resources dedicated for specific components of public finance vary significantly as a result of infiltrations. In particular, difference-in-differences estimates reveal that infiltrated municipalities commit to invest higher shares of resources in construction and waste management, and are less effective in collecting waste taxes. These results are robust to changes in specifications and to a series of robustness checks.

These findings shed some light on the strategy of organised crime when it endeavours to take control of local politics and consequences for local state capacity. Interestingly, influences on political choices perpetrated by organised crime seem to impact on public finances in a different way as compared to generic forms of political interference as identified in the literature. While previous empirical studies on the capturing of political decision-making have found that the undue influence of powerful interest groups on politics (e.g. through corruption) determines a general inflation of public capital expenditures (Tanzi and Davoodi, 1997), our analysis reveals that mafia infiltrations do not necessarily entail higher public spending overall, which may increase the probability of mafia's political trustees to be noticed and possibly removed from power for financial instability reasons. Rather, local finances are modified only in the key sectors where the mafia has interests to protect. In particular, the largest influence on the municipal financial budget seems to involve a substantial diversion of investment funds towards the construction and waste management

sector, which is considered crucial for mafia groups in order to reinforce their presence locally, protect their traffics, and further increase business profits (Gambetta, 1993). Despite more and better evidence is needed, this seems to occur through disproportionate amounts of money tendered out in this sector during infiltrations, which do not translate into better public services for citizens.

The fact that infiltrated governments do not appear to be more likely to incur in financial mismanagement issues makes it more complicated to detect and remove them. As a consequence, in local territories where the presence of the mafia is more pervasive, efforts to ‘clean up’ legal institutions from politicians linked to criminal organisations must be considerable. The 164/1991 law has allowed to discover and put an end to hundreds of collusion cases, but the relative frequency of repeated dissolutions in the same municipality (sometimes after just a few years) demonstrates that more powerful legislative tools are needed to completely eradicate the phenomenon of political infiltrations. A strengthening of the law allowing mafia-related government dissolutions, under discussion in these years (Cantone and Di Feo, 2014), may prove helpful. However, this reform could be insufficient if not coupled with measures preventing any potential distortions to democratic competition at local elections. Equally important to limit the local power of mafia clans would be to guarantee public services and employment opportunities in the small towns and urban neighbourhoods where organised crime currently has the upper hand.

How harmful is a protracted mafia-capturing of political systems for the socio-economic development of local communities? This will depend on how detrimental for the economy are the distortions in public finances and political competition identified by our study. While we have briefly discussed the negative implications of such interference, our estimates do not calculate their precise welfare impact. We leave the task of quantifying the socio-economic effects of infiltrations to future research.

To conclude, our analysis has unveiled the impact mafia infiltrations may have on pol-

icy choices. Our study contributes to a deeper understanding of such phenomenon and, possibly, aid in its prevention.

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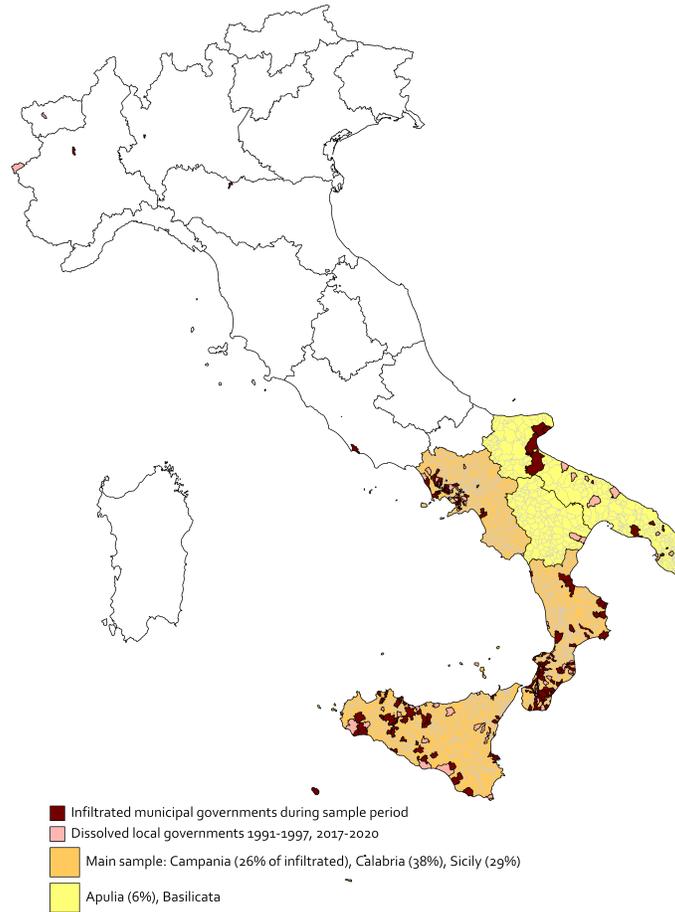
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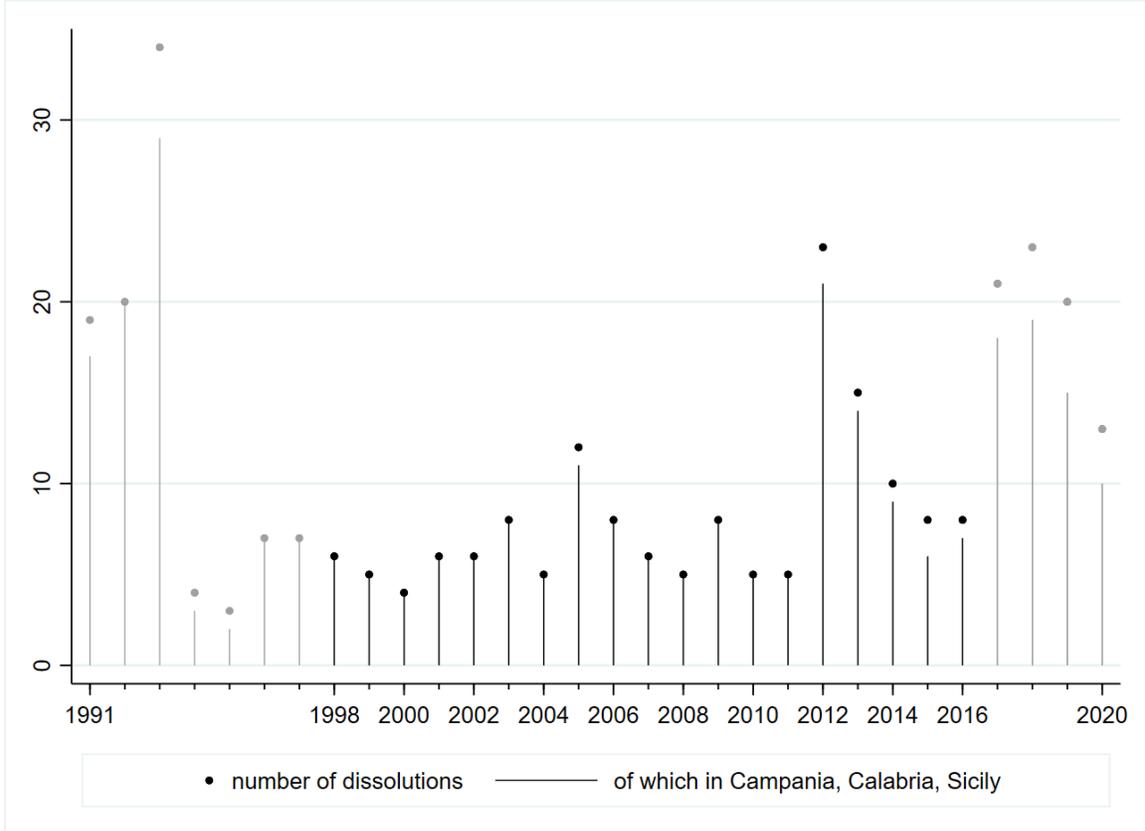
Figures in the Main Text

Figure 1: Map of infiltrated local governments



Note: Source: Italian Ministry of Interior, authors' own elaboration. Number and location of the city council dismissals calculated in April 2021.

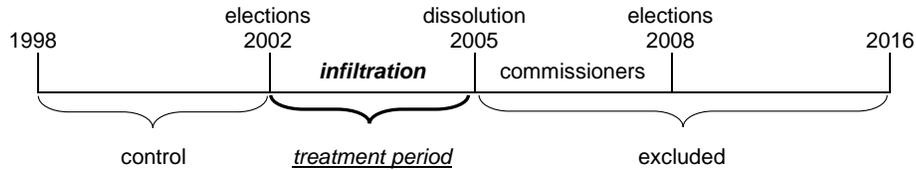
Figure 2: Number of dissolved municipal governments for mafia infiltration, 1991-2020



Note: Source: Italian Ministry of Interior. The figure shows the yearly number of municipal dissolutions. Calabria, Campania and Sicily (the main sample of our study) have experienced the highest number of dissolutions. Black: sample period 1998-2016; light grey: years not in sample. Number of dissolutions calculated in April 2021.

Figure 3: Identification of the treatment period

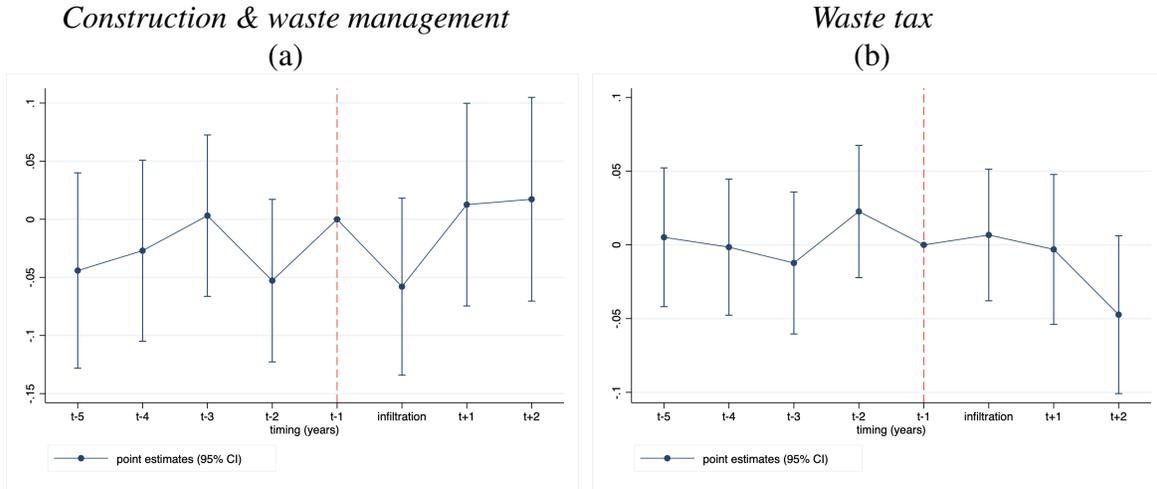
Electoral history of the municipality of Casoria (Campania)



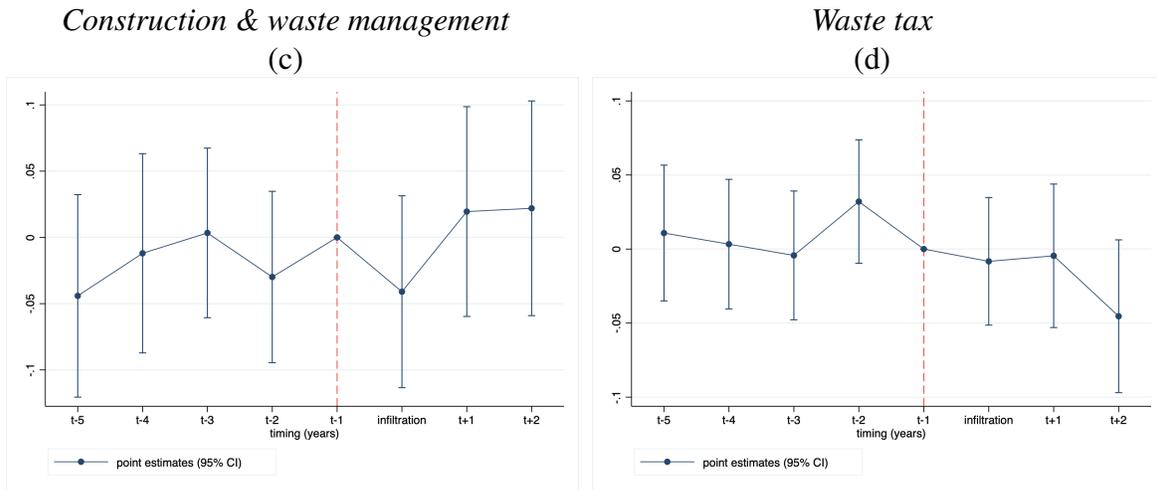
Note: In this example (Casoria), the treatment period begins with the election of Casoria's local government in 2002 to its dissolution in 2005. During this period, organised crime was colluding with members of the local government. Importantly, the commissioning period (during which the municipalities is under the administrators sent from Rome), and the years afterwards are excluded in the analysis. As explained in Section 3, this is to avoid and post treatment bias that might contaminate the control group.

Figure 4: Dynamic panel estimation (Event study)

Campania, Calabria, Sicily



Campania, Calabria, Sicily, Apulia, Basilicata



Note: Dots refer to point estimates, spikes to 95% confidence intervals. We include dummy variables relative to 5 years prior to and 2 years after the election of the infiltrated government. The omitted category is the first year before the elections of the infiltrated government. We keep a balanced window across periods. The outcome variables are capital spending for construction & waste management (panels (a), (c)) and waste tax collection efficacy (panels (b), (d)). Sample: municipalities of Calabria, Campania and Sicily (panels (a), (b)), municipalities of Calabria, Campania, Sicily, Apulia, and Basilicata (panels (c), (d)). Years *after* the dissolution of the infiltrated governments are excluded. Moreover, municipalities with two or more dissolutions are excluded, i.e. the sample is composed by municipalities dissolved only once. Estimates are conditional on municipality fixed effects, year fixed effects and province*year fixed effects. Standard errors clustered at the municipal level.

Tables in the Main Text

Table 1: Infiltration and total per capita spending

	(1)	(2)	(3)	(4)	(5)
<i>Panel A - Dep var: total spending pc</i>					
Infiltration	0.00241 (0.0222)	0.00175 (0.0229)	-0.00775 (0.0223)	-0.00451 (0.0223)	-0.00246 (0.0202)
Observations	22,822	3,685	21,648	21,648	29,972
R-squared	0.527	0.554	0.531	0.562	0.571
Mean Y	7.006	6.85	7.006	7.006	6.97
<i>Panel B - Dep var: total capital expenditures pc</i>					
Infiltration	0.0255 (0.0745)	-0.0131 (0.0798)	-0.00281 (0.0730)	-0.0247 (0.0743)	-0.0270 (0.0683)
Observations	22,763	3,681	21,593	21,593	29,933
R-squared	0.354	0.330	0.363	0.406	0.366
Mean Y	5.48	5.12	5.48	5.48	5.5
<i>Panel C - Dep var: total current expenditures pc</i>					
Infiltration	-0.00505 (0.0147)	0.00392 (0.0153)	-0.00797 (0.0149)	-0.00919 (0.0141)	-0.00177 (0.0136)
Observations	22,819	3,682	21,645	21,645	29,966
R-squared	0.813	0.712	0.808	0.817	0.833
Mean Y	6.55	6.53	6.55	6.55	6.52
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes
Matched sample		Yes			
Exclusion Y2012			Yes	Yes	
Province*year FEs				Yes	
Apulia and Basilicata					Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The analysis compares the total spending of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Outcome variables: Log total per capita spending (Panel A); log total per capita capital expenditures (Panel B); log total per capita current expenditures (Panel C). Controls at baseline (1998) and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Main sample: 1350 municipalities of Campania, Calabria and Sicily. Column (1) is our baseline specification. Column (2) performs the analysis on a matched sample of 232 municipalities. Column (3) drops the year 2012. Column (4) includes province*year FEs. Column (5) expands the data to Apulia and Basilicata.

Table 2: Infiltration and capital spending categories

	(1)	(2)	(3)	(4)	(5)
<i>Panel A - Dep. var.: Administration</i>					
Infiltration	-0.00863 (0.0160)	0.000464 (0.0175)	-0.00528 (0.0166)	0.00310 (0.0164)	-0.00280 (0.0150)
Observations	22,595	3,651	21,425	21,425	29,442
R-squared	0.248	0.250	0.252	0.271	0.251
Mean Y	0.15	0.15	0.15	0.15	0.15
<i>Panel B - Dep. var.: Social sector</i>					
Infiltration	-0.00274 (0.00872)	-0.00217 (0.00994)	-0.00391 (0.00833)	-0.00197 (0.00874)	-0.00534 (0.0081)
Observations	22,473	3,624	21,303	21,303	29,290
R-squared	0.134	0.155	0.136	0.152	0.132
Mean Y	0.062	0.061	0.062	0.062	0.06
<i>Panel C - Dep. var.: Construction & waste management</i>					
Infiltration	0.0489** (0.0225)	0.0438* (0.0231)	0.0572** (0.0229)	0.0517** (0.0220)	0.0429** (0.0208)
Observations	22,704	3,669	21,534	21,534	29,561
R-squared	0.196	0.246	0.201	0.225	0.201
Mean Y	0.34	0.34	0.34	0.34	0.34
<i>Panel D - Dep. var.: Public transport & lighting</i>					
Infiltration	-0.0224 (0.0153)	-0.0345** (0.0160)	-0.0255 (0.0155)	-0.0311** (0.0152)	-0.0281* (0.0144)
Observations	22,649	3,657	21,479	21,479	29,492
R-squared	0.177	0.224	0.180	0.201	0.174
Mean Y	0.22	0.21	0.22	0.22	0.21
<i>Panel E - Dep. var.: Education</i>					
Infiltration	0.00394 (0.0130)	0.0104 (0.0136)	0.000358 (0.0130)	7.41e-06 (0.0124)	0.00414 (0.0124)
Observations	22,408	3,624	21,238	21,238	29,190
R-squared	0.122	0.153	0.125	0.154	0.123
Mean Y	0.09	0.09	0.09	0.09	0.09
<i>Panel F - Dep. var.: Police</i>					
Infiltration	-0.000802 (0.00114)	-0.00099 (0.00139)	-0.000866 (0.00123)	-0.00089 (0.00128)	0.00265 (0.00266)
Observations	22,063	3,561	20,893	20,893	28,775
R-squared	0.130	0.218	0.129	0.149	0.130
Mean Y	0.003	0.0056	0.003	0.003	0.003
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes
Matched Sample		Yes			
Exclusion Y2012			Yes	Yes	
Province*Year FEs				Yes	
Apulia and Basilicata					Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. The analysis compares the capital spending components of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Outcomes: yearly capital expenditure spending for Administration (Panel A); social sector (Panel B); construction and waste management (Panel C); public transport and lighting (Panel D); education (Panel E) and police (Panel F). Controls at baseline (1998) and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Main sample: 1350 municipalities of Campania, Calabria and Sicily. Column (1) is our baseline specification. Column (2) performs the analysis on a matched sample of 232 municipalities. Column (3) drops the year 2012. Column (4) includes province*year FEs. Column (5) expands the data to Apulia and Basilicata.

Table 3: Infiltration and current spending categories

	(1)	(2)	(3)	(4)	(5)
<i>Panel A - Dep. var.: Administration</i>					
Infiltration	-0.0106* (0.00547)	-0.0130** (0.00611)	-0.0116** (0.00565)	-0.0134** (0.00579)	-0.00888* (0.00504)
Observations	22,812	3,681	21,638	21,638	29,958
R-squared	0.709	0.685	0.705	0.730	0.714
Mean Y	0.42	0.39	0.42	0.42	0.41
<i>Panel B - Dep. var.: Social sector</i>					
Infiltration	0.000967 (0.00558)	0.00347 (0.00555)	0.00161 (0.00589)	-0.000691 (0.00573)	-0.000203 (0.00510)
Observations	22,811	3,681	21,637	21,637	29,958
R-squared	0.606	0.599	0.600	0.616	0.603
Mean Y	0.07	0.085	0.07	0.07	0.07
<i>Panel C - Dep. var.: Construction & waste management</i>					
Infiltration	0.00764 (0.00520)	0.00738 (0.00583)	0.00756 (0.00530)	0.00546 (0.00502)	0.00696 -0.00478
Observations	22,810	3,681	21,636	21,636	29,956
R-squared	0.724	0.706	0.722	0.760	0.718
Mean Y	0.23	0.26	0.23	0.23	0.23
<i>Panel D - Dep. var.: Public transport & lighting</i>					
Infiltration	-0.00324 (0.00247)	-0.0042* (0.00242)	-0.0036 (0.00253)	-0.000728 (0.00249)	-0.00306 (0.00230)
Observations	22,809	3,681	21,635	21,635	29,956
R-squared	0.692	0.714	0.689	0.705	0.677
Mean Y	0.08	0.073	0.08	0.08	0.08
<i>Panel E - Dep. var.: Education</i>					
Infiltration	0.000635 (0.00196)	0.00149 (0.00203)	0.000478 (0.00206)	0.00205 (0.00202)	0.000272 (0.00181)
Observations	22,810	3,681	21,636	21,636	29,956
R-squared	0.807	0.820	0.807	0.817	0.803
Mean Y	0.078	0.074	0.078	0.078	0.080
<i>Panel F - Dep. var.: Police</i>					
Infiltration	0.000573 (0.00163)	0.00181 (0.00176)	0.000801 (0.00167)	0.0011 (0.00172)	0.000691 (0.00151)
Observations	22,807	3,681	21,633	21,633	29,952
R-squared	0.630	0.688	0.627	0.637	0.629
Mean Y	0.056	0.056	0.056	0.056	0.058
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes
Matched Sample		Yes			
Exclusion Y2012			Yes	Yes	
Province*Year FEs				Yes	
Apulia and Basilicata					Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. The analysis compares the current spending components of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. The dependent variables are yearly current expenditure spending for Administration (Panel A); social sector (Panel B); construction and waste management (Panel C); public transport and lighting (Panel D); education (Panel E) and police (Panel F). Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Main sample: 1350 municipalities of Campania, Calabria and Sicily. Column (1) is our baseline specification. Column (2) performs the analysis on a matched sample of 232 municipalities. Column (3) drops year 2012. Column (4) includes province*year FEs. Column (5) expands the data to Apulia and Basilicata.

Table 4: Infiltration and local revenues collection

	(1)	(2)	(3)	(4)	(5)
<i>Panel A - Dep. var.: Property tax</i>					
Infiltration	-0.0141 (0.0172)	-0.0192 (0.0181)	-0.0140 (0.0177)	-0.00473 (0.0179)	-0.0133 (0.0162)
Observations	22,082	3,583	21,002	21,002	29,075
R-squared	0.343	0.405	0.323	0.349	0.359
Mean Y	0.66	0.64	0.66	0.66	0.67
<i>Panel B - Dep. var.: Waste tax</i>					
Infiltration	-0.0357** (0.0143)	-0.0363** (0.0161)	-0.0405*** (0.0148)	-0.0199 (0.0144)	-0.0342** (0.0140)
Observations	20,203	3,254	19,094	19,094	26,964
R-squared	0.540	0.546	0.545	0.571	0.578
Mean Y	0.18	0.136	0.18	0.18	0.22
<i>Panel C - Dep. var.: Total taxes</i>					
Infiltration	-0.0183 (0.0124)	-0.0269** (0.0129)	-0.0206* (0.0123)	-0.0308*** (0.0114)	-0.0173 (0.0113)
Observations	23,010	3,712	21,816	21,816	30,184
R-squared	0.581	0.551	0.576	0.624	0.603
Mean Y	0.53	0.50	0.53	0.53	0.58
<i>Panel D - Dep. var.: Total revenues</i>					
Infiltration	0.00244 (0.00928)	0.00497 (0.0102)	0.00309 (0.00967)	3.12e-05 (0.00941)	0.0020 (0.00856)
Observations	23,003	3,709	21,809	21,809	30,177
R-squared	0.403	0.472	0.411	0.455	0.402
Mean Y	0.58	0.59	0.58	0.58	0.58
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes
Matched Sample		Yes			
Exclusion Y2012			Yes	Yes	
Province*Year FEs				Yes	
Apulia and Basilicata					Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. The analysis compares the revenue collection of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Outcomes: "Property tax" (Panel A), "Waste tax" (Panel B), "Total taxes" (Panel C), "Total revenues" (Panel D). Outcomes are calculated as the ratio between the actual collected amount of resources (*riscossioni*) and the forecasted amount (*accertamenti*). Controls at baseline (1998) and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Main sample: 1350 municipalities of Campania, Calabria and Sicily. Column (1) is our baseline specification. Column (2) performs the analysis on a matched sample of 232 municipalities. Column (3) drops year 2012. Column (4) includes province*year FEs. Column (5) expands the data to Apulia and Basilicata.

Table 5: Infiltration and municipal debt

	(1)	(2)	(3)	(4)	(5)
<i>Panel A - Dep. var.: Total debt (log)</i>					
Infiltration	0.105** (0.0426)	0.0729 (0.0450)	0.0924** (0.0437)	0.0966** (0.0447)	0.0982** (0.0401)
Observations	23,028	3,715	21,834	21,834	30,196
R-squared	0.706	0.864	0.704	0.721	0.708
Mean Y	14.43	14.9	14.43	14.43	14.4
<i>Panel B - Dep. var.: Total debt/total revenues</i>					
Infiltration	-0.00651 (0.0396)	-0.0111 (0.0411)	-0.00675 (0.0411)	0.0179 (0.0416)	-0.0107 (0.517)
Observations	22,957	3,714	21,765	21,765	30,120
R-squared	0.282	0.331	0.288	0.323	0.279
Mean Y	0.89	0.75	0.89	0.89	0.87
<i>Panel C - Dep. var.: Deficit</i>					
Infiltration	0.0311 (0.0313)	0.0481 (0.0340)	0.0342 (0.0327)	0.0343 (0.0321)	0.0136 (0.0295)
Observations	23,254	3,770	22,057	22,057	30,488
R-squared	0.223	0.286	0.221	0.238	0.213
Mean Y	0.41	0.38	0.41	0.41	0.42
Municipality dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes
Matched Sample		Yes			
Exclusion Y2012			Yes	Yes	
Province*Year FEs				Yes	
Apulia and Basilicata					Yes

Note: Clustered standard errors at municipality level in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The analysis compares the municipal debt towards third parties and the municipal deficit of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. We measure debt with the total municipal debt toward third parties. Outcomes: "Total revenues/total debt" (Panel A), "Total debt (log)" (Panel B), "Deficit" (Panel C). We exclude from the analysis instances with abnormal values of "Total revenues/total debt" (> 10). Controls at baseline (1998) and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Main sample: 1350 municipalities of Campania, Calabria and Sicily. Column (1) is our baseline specification. Column (2) performs the analysis on a matched sample of 232 municipalities. Column (3) drops year 2012. Column (4) includes province*year FEs. Column (5) expands the data to Apulia and Basilicata.

Table 6: Timing of the infiltration

	<i>Construction & waste management</i>			<i>Waste tax</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Infiltration	0.049** (0.022)	0.049** (0.024)		-0.036** (0.014)	-0.044*** (0.016)	
Prior legislature			0.036 (0.024)			-0.023 (0.021)
Observations	22,704	22,561	22,110	20,203	20,081	19,694
R-squared	0.196	0.197	0.199	0.540	0.539	0.539
Mean Y	0.34	0.34	0.34	0.18	0.18	0.18
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Excl. same mayor		Yes	Yes		Yes	Yes

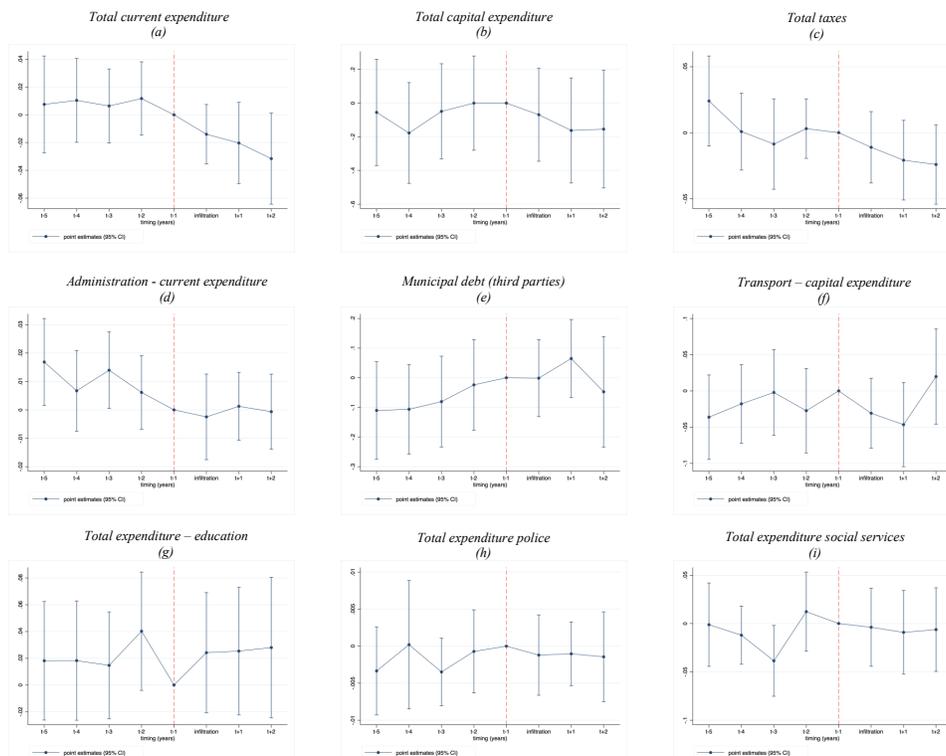
Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Dependent variables are capital expenditure for construction and waste management (columns 1 to 3) and waste tax (columns 3 to 6). We estimate the analysis on our main sample of all municipalities of Calabria, Campania and Sicily. All estimations are conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. In Columns (2), (3), (5) and (6) we exclude from the sample all municipality-years in which municipalities are ruled by the same mayors in their first term that will be infiltrated and dissolved during their second term. In Columns (3) and (6) we regress *Prior legislature*, a dummy variable taking value of 1 for the entire legislature before the election of a later-dissolved government, on our main outcomes. When doing this, we exclude from the sample infiltrated years. In all estimations commissioning period and post-commissioning years are excluded.

Appendix

Appendix A

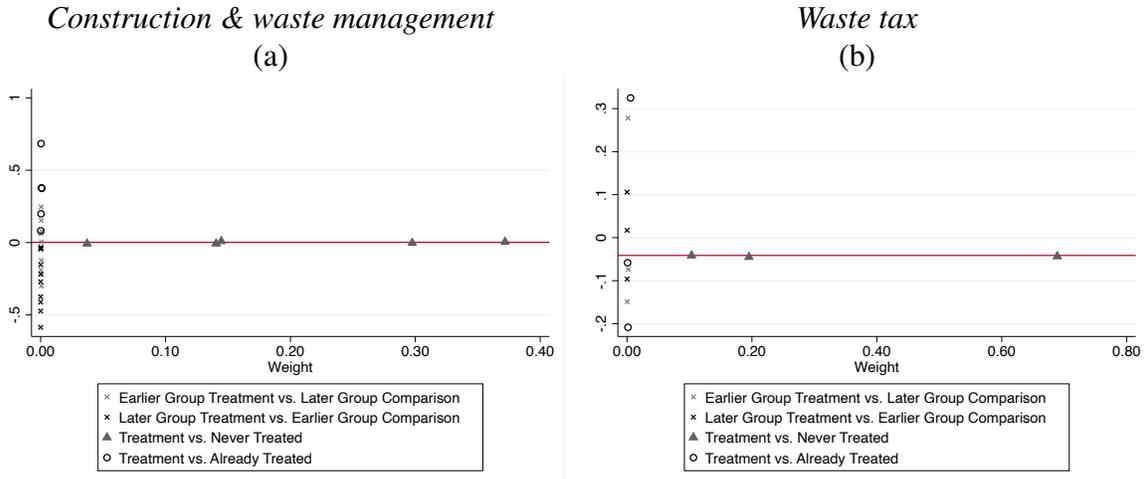
Figures and Tables

Figure A1: Event study - all outcomes



Note: Event study. Dots refer to point estimates, spikes to 95% confidence intervals. We include dummy variables relative to 5 years prior to and 2 years after the election of the infiltrated government. The omitted category is the first year before the infiltration. The outcome variables are: total current expenditure (a), total capital expenditure (b), total taxes (c), current expenditure for administration (d), municipal debt (e), capital spending for transport (f), total expenditure for education (g), total expenditure for municipal police (h) and total expenditure for social services (i). Sample of municipalities of Campania, Calabria, Sicily. All years *after* the dissolution of the infiltrated governments are excluded. Municipalities with two or more dissolutions are excluded. Estimates are conditional on municipality fixed effects, year fixed effects and province*year fixed effects. Standard errors clustered at the municipal level.

Figure A2: Bacon Decomposition



Note: Note.Bacon decomposition for our main results: *construction and waste management* and *waste tax*. The two panels report visually the distribution of the weight in the 2x2 difference in differences with staggered timing. The weights are reported in the table.

Bacon decomposition

	<i>Construction waste management - weight</i> (1)	<i>Waste tax - weight</i> (2)
Earlier T vs. Later C	0.006	0.004
Later T vs. Earlier C	0.001	0.000
T vs. Never treated	0.991	0.987
T vs. Already treated	0.002	0.008

Note: The table shows the relative weights of the 2X2 difference in differences regressions. Goodman-Bacon break downs the average DD estimates in four comparisons. Treated units versus never treated unit exhibit the highest weight for both outcome variables.

Table A1: Matching - balancing test

Municipal characteristics	Mean treated	Mean control	t-test	P-value
Population (log)	8.87	8.93	-0.36	0.719
Employment share	0.226	0.232	-1.22	0.223
Unemployment share	0.1	0.099	0.53	0.597
Share employment industry	0.181	0.18	-0.02	0.986
Share employment in services	0.53	0.528	0.09	0.932
Share employment in agriculture	0.141	0.146	-0.37	0.713
Share with high school degree	0.203	0.204	-0.12	0.901
Share of illiterates	0.0443	0.044	-0.09	0.93
Total municipal spending per capita (log)	6.64	6.67	-0.6	0.547
Total municipal area (km ²)	47.088	58.69	-1.46	0.146
Municipal altitude (log)	4.86	4.82	0.18	0.854
Total number of houses (log)	8.23	8.32	0.57	0.568
Distance from the coast	10078	8980.4	1.04	0.297
Landlocked municipality	0.603	0.54	0.93	0.355
Distance from the region capital	22.742	23.057	-0.18	0.86

Note: The table performs a nearest neighbour propensity score matching and pairs treated municipalities with the most similar control municipalities across a set of pre-specified characteristics. We match with common support and without replacement. The table reports the variables used to perform our matching algorithm. The table reports a set of covariates related to: socio-demographic characteristics, local public expenditure, and geographical features. These are taken at baseline (i.e. 1998). The matched sample is made of 232 municipalities, half of which experienced infiltrations and dissolutions.

Table A2: Descriptive statistics

	Campania, Calabria, Sicily			Campania, Calabria, Sicily, Apulia, Basilicata		
	Obs	Mean	Std dev	Obs	Mean	Std dev
<i>Total expenditures per capita</i>						
Total	25,189	1320.1	1169.8	32,478	1299.1	1208.6
Capital expenditures	25,192	566.36	1067.73	32,507	567.71	1087.33
Current expenditures	25,191	753.66	338.18	32,480	731.32	335.66
<i>Capital expenditure (share of total)</i>						
Administration	24,923	0.151	0.218	31,898	0.15	0.21
Social sector	24,787	0.062	0.135	31,732	0.062	0.133
Construction and waste management	25,032	0.345	0.295	32,017	0.334	0.298
Public transport and lighting	24,976	0.222	0.242	31,947	0.215	0.237
Education	24,730	0.091	0.163	31,639	0.090	0.161
Municipal police	24,362	0.003	0.02	31,201	0.0036	0.020
<i>Current expenditure (share of total)</i>						
Administration	25,153	0.425	0.097	32,436	0.41	0.0957
Social sector	25,152	0.073	0.061	32,436	0.078	0.061
Construction and waste management	25,151	0.237	0.089	32,434	0.233	0.086
Public transport and lighting	25,149	0.082	0.042	32,433	0.083	0.041
Education	25,151	0.078	0.039	32,434	0.0801	0.039
Municipal police	25,148	0.057	0.027	32,430	0.058	0.026
<i>Municipal revenues (efficacy measure)</i>						
Property tax	24,316	0.665	0.22	31,444	0.67	0.22
Waste tax	22,264	0.179	0.296	29,147	0.223	0.314
Total taxes	25,388	0.53	0.18	32,699	0.55	0.18
Total revenues	25,381	0.583	0.176	32,692	0.588	0.17
<i>Debt and deficit</i>						
Debt as share of revenues	25,334	0.896	0.96	32,634	0.868	0.93
Total debt (log)	25,407	14.44	1.22	32,712	14.48	1.212
Deficit	25,650	0.417	0.493	33,022	0.426	0.495
<i>Municipal characteristics (at baseline 1998)</i>						
Population (log)	25,650	8.253	1.137	33,022	8.338	1.155
Share employed	25,650	0.254	0.044	33,003	0.259	0.043
Share unemployed	25,631	0.083	0.035	32,984	0.081	0.033
Share employed in industry	25,631	0.206	0.068	33,003	0.217	0.071
Share employed in services	25,574	0.547	0.137	32,946	0.542	0.129
Share highly educated	25,650	0.215	0.058	33,003	0.214	0.056
Share illiterate	25,631	0.046	0.027	32,984	0.045	0.026
Share employed in agriculture	25,650	0.14	0.101	33,003	0.153	0.099
<i>Political variables</i>						
Prior legislature	25,650	0.017	0.130	33,022	0.013	0.114
Last mandate	25,521	0.317	0.465	25,521	0.317	0.465
Right party	25,611	0.207	0.405	25,646	0.207	0.405
Left party	25,611	0.359	0.480	25,646	0.359	0.479
Centre party	25,611	0.425	0.494	25,646	0.424	0.494
Civic list	25,611	0.045	0.207	25,646	0.046	0.210
Single candidate	25,650	0.008	0.090	33,022	0.007	0.084
<i>Treatment variable and placebo treatment</i>						
Nr of infiltrated municipalities (1998-2016)			157			168
Infiltrated 1998-2016, excluding municipalities dissolved before 1998			124			135
Nr of mafia-unrelated dissolutions (1998-2016)			439			595

Note: The sum of the means of all capital account or current account spending components does not sum up to 1 due to the fact that there are some other minor spending items (Appendix C). The number of infiltrated municipalities in Calabria, Campania and Sicily is 157. This includes some municipalities which have already been dissolved before 1998 (this include also municipalities dissolved before 1998 and (also) after, that is, during our sample period). As explained in section 3, we drop these from the sample to avoid contamination in the control group. The final sample is composed by 124 treated municipalities in Calabria, Campania and Sicily.

Table A3: Infiltration and aggregate (capital and current) spending components

	<i>Administration</i>		<i>Social sector</i>		<i>Construction & waste management</i>		<i>Public transport & lighting</i>		<i>Education</i>		<i>Police</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Infiltration	-0.019 (0.017)	-0.010 (0.017)	-0.003 (0.011)	-0.003 (0.010)	0.056** (0.024)	0.056** (0.023)	-0.025 (0.016)	-0.031** (0.016)	0.005 (0.013)	0.002 (0.013)	-0.000 (0.002)	0.000 (0.002)
Observations	22,586	21,416	22,463	21,293	22,690	21,520	22,638	21,468	22,399	21,229	22,057	20,887
R-squared	0.327	0.353	0.221	0.241	0.252	0.284	0.211	0.233	0.166	0.195	0.490	0.504
Mean Y	0.57	0.57	0.135	0.135	0.580	0.580	0.305	0.305	0.168	0.168	0.606	0.606
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exclusion Y2012		Yes		Yes		Yes		Yes		Yes		Yes
Province*year dummies		Yes		Yes		Yes		Yes		Yes		Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. The analysis compares aggregate spending categories (sum of current and capital expenditures) of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. The dependent variables are calculated as the sum of the yearly capital expenditure (as share of the total) and yearly current expenditure (as share of the total) for each spending item. Administration (columns (1)-(2)); social sector (columns (3)-(4)); construction and waste management (columns (5)-(6)); public transport and lighting (columns (7)-(8)); education (columns (9)-(10)) and police (columns (11)-(12)). Controls at baseline (1998) and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. Main sample: municipalities of Campania, Calabria and Sicily.

Table A4: Municipal procurement

	<i>Share construction & waste</i>		<i>Share roads & transport</i>		<i>Share services</i>		<i>Share art & culture</i>		<i>Share other</i>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Infiltration	0.0589*	0.0622**	-0.0243	-0.0100	-0.0190	-0.0199	-0.0124*	-0.00723	-0.0136	-0.0211
	(0.0311)	(0.0313)	(0.0365)	(0.0359)	(0.0148)	(0.0151)	(0.00750)	(0.00743)	(0.0315)	(0.0314)
Observations	12,374	12,374	12,374	12,374	12,374	12,374	12,374	12,374	12,374	12,374
R-squared	0.203	0.226	0.187	0.224	0.132	0.153	0.168	0.198	0.176	0.209
Mean Y	0.21	0.21	0.195	0.195	0.024	0.024	0.027	0.027	0.23	0.23
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province*Year FEs		Yes		Yes		Yes		Yes		Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. The commissioning period and the years after that are always excluded. The outcome variables represent the starting value for different municipal tenders. Precisely, in columns (1) and (2) construction and waste (sum of tenders for buildings and waste), in columns (3) and (4) roads and transport, in columns (5) and (6) services, in columns (7) and (8) art and culture and in columns (9) and in column (10) all other residual categories. Outcomes are expressed as share of the total amount of money tendered out by the municipality, conditional on the municipality having had an auction. The sample is all municipalities with at least an auction of Campania, Calabria and Sicily from 2000 to 2012. Controls at baseline and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Column (1) is our baseline specification conditional on municipalities fixed effects, year fixed effects and controls at baseline interacted with time dummies. Column (2) introduces province*year fixed effects.

Table A5: Mafia-infiltrated firms and dissolved municipalities

	<i>Mafia firms</i>	
	(1)	(2)
Municipal dissolution	0.400*** (0.0300)	0.196*** (0.0324)
Controls	No	Yes
Observations	1,350	1,346
R-squared	0.081	0.304

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The table shows simple correlation between municipalities with cases of firm(s) either seized or under investigation for mafia infiltration and the dissolved municipalities. It employs a cross sectional dataset where mafia firm is a dummy variable equal to 1 if in a given municipality there is a firm linked to criminal organisations according to the Italian Financial Guards. Dissolution is a dummy variable taking value 1 if the municipality has been dissolved. In column 2 we include socio-demographic controls at municipal level. The cross sectional dataset on municipalities where infiltrated firms are located has been obtained from the Italian Financial Guards.

Table A6: Waste collection services

	<i>Number of households served per capita (log)</i>			<i>Tons of processed waste per capita (log)</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Infiltration	-0.0228 (0.0899)	-0.0379 (0.0923)	-0.00516 (0.0944)	-0.00413 (0.227)	-0.0743 (0.219)	-0.141 (0.223)
Observations	15,898	14,679	14,677	14,870	13,788	13,774
R-squared	0.316	0.316	0.356	0.302	0.332	0.334
Municipal dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Management type dummy		Yes	Yes		Yes	Yes
Exclusion 2012			Yes			Yes
Province*year FEs			Yes			Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. The commissioning period and the years after that are always excluded. The outcome variables are a) the number of households normalised by population and b) the log of tons of processed waste per inhabitant. Management type dummy: set of dummies for waste management type (e.g. consortium, private firm, municipality-controlled firm, public entities, PPP). The sample is composed by municipalities in Calabria, Campania and Sicily from 1998 to 2015. Controls at baseline (1998) and interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holder. These correlations are conditional on municipalities fixed effects, year fixed effects, and controls at baseline interacted with time dummies. Columns 2 and 5 include a dummy for the management type. Columns 3 and 6 exclude year 2012 and control for province*years fixed effects.

Table A7: Selection into treatment

	<i>Construction & waste management</i>			<i>Waste tax</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Infiltration	0.055** (0.024)	0.063*** (0.024)	0.057** (0.023)	-0.040*** (0.015)	-0.046*** (0.015)	-0.025* (0.015)
Observations	22,680	21,511	21,511	20,179	19,071	19,071
R-squared	0.196	0.201	0.225	0.540	0.546	0.571
Mean Y	0.34	0.34	0.34	0.18	0.18	0.18
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Exclusion Y2012		Yes	Yes		Yes	Yes
Province*Year FEs			Yes			Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The analysis compares capital expenditures in construction and waste management and waste tax of non-infiltrated government with infiltrated governments, before and during the infiltration. For treated municipalities, the commissioning period and all years after that are excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Municipalities for which the the main reason for a) dissolution or b) the police investigation in the first place was explicitly reported to be related to distortions in the balance sheets (anomalies in spending patterns) are excluded from sample. These municipalities are San Gennaro Vesuviano, Guardavalle, Terme Vigliatore, Plati', San Gregorio d'Ippona, Montelepre, Casoria, Corigliano Calabro and Badolato. Hence, the analysis is based on all municipalities for which the investigation for dissolution started for reasons unrelated to public spending. Dependent variables are capital expenditure for construction and waste management (columns 1 to 3) and waste tax (columns 3 to 6). We estimate the analysis on our main sample of all municipalities of Calabria, Campania and Sicily. All estimations are conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. In columns 2 and 5 we exclude 2012 from the sample. In columns 3 and 6 we include province-year fixed effects.

Table A8: Mafia-unrelated dissolutions - main results

	<i>Construction and waste management</i>		<i>Waste tax</i>	
	(1)	(2)	(3)	(4)
Mafia-unrelated dissolution	-0.017 (0.010)	-0.014 (0.011)	-0.007 (0.009)	-0.010 (0.009)
Observations	22,062	22,062	19,618	19,618
R-squared	0.199	0.222	0.535	0.560
Mean Y	0.34	0.34	0.18	0.18
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes
Province*Year FEs		Yes		Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Mafia-unrelated dissolution is an indicator equal to 1 and it refers to local government whose regular legislature has been interrupted for non mafia related reasons. Dependent variables are construction and waste management (columns 1 to 2) and waste tax (columns 3 to 4). We estimate the analysis on our main sample of all municipalities of Calabria, Campania and Sicily. Municipalities dissolved for mafia infiltration are dropped from the sample. All estimations are conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. In columns 2 and 4 we include province-year fixed effects.

Table A9: Mafia-unrelated dissolutions - other outcome variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	<i>Total capital exp.</i>	<i>Total current exp.</i>	<i>Total expenditures</i>	<i>Administration capital exp.</i>	<i>Social capital exp.</i>	<i>Transport capital exp.</i>	<i>Education capital exp.</i>	<i>Police capital exp.</i>	<i>Administraton current exp.</i>	<i>Social current exp.</i>
Mafia-unrelated dissolution	-0.104*** (0.039)	0.001 (0.005)	-0.019 (0.013)	0.013 (0.008)	0.002 (0.005)	0.003 (0.008)	0.001 (0.007)	-0.000 (0.001)	0.001 (0.002)	-0.004** (0.002)
Observations	22,119	22,175	22,176	21,966	21,846	22,013	21,792	21,466	22,168	22,167
R-squared	0.358	0.837	0.532	0.247	0.133	0.175	0.123	0.139	0.711	0.608
	<i>Construction current exp.</i>	<i>Transport current exp.</i>	<i>Education capital exp.</i>	<i>Police capital exp.</i>	<i>Property tax</i>	<i>Total taxes</i>	<i>Total revenues</i>	<i>Total debt / tot. revenues</i>	<i>Total debt</i>	<i>Deficit</i>
Mafia-unrelated dissolution	0.003 (0.002)	-0.001 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.004 (0.007)	-0.006 (0.005)	0.006 (0.006)	-0.022 (0.028)	-0.021 (0.022)	-0.006 (0.017)
Observations	22,166	22,165	22,166	22,163	21,430	22,360	22,353	22,309	22,379	22,591
R-squared	0.721	0.691	0.806	0.623	0.342	0.580	0.399	0.280	0.707	0.223
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. NMD is an indicator equal to one and it refers to local government whose regular legislature has been interrupted for non mafia related reasons. The table is divided in two panels and it reports all municipal spending items, revenues and public finance indicators which are NOT included in table A8. We estimate the analysis on our main sample of all municipalities of Calabria, Campania and Sicily. Municipalities dissolved for mafia infiltration are dropped from the sample. The estimation is conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders.

Table A10: Political business cycle

	<i>Construction & waste management</i>			<i>Waste tax</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Infiltration	0.047** (0.023)	0.055** (0.023)	0.048** (0.022)	-0.034** (0.014)	-0.039*** (0.015)	-0.018 (0.014)
Observations	22,704	21,534	21,534	20,203	19,094	19,094
R-squared	0.197	0.201	0.225	0.540	0.546	0.571
Mean Y	0.34	0.34	0.34	0.18	0.18	0.18
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Election Years	Yes	Yes	Yes	Yes	Yes	Yes
Exclusion Y2012		Yes	Yes		Yes	Yes
Province*Year FEs			Yes			Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The analysis replicates our main results controlling non parametrically for election-year fixed effects. For treatment municipalities, commissioning period and years the commissioning period are always excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Dependent variables are construction and waste management (columns 1 to 3) and waste tax (columns 3 to 6). Sample of municipalities of Calabria, Campania and Sicily. All estimations are conditional on municipal fixed effects, year fixed effects, election years fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. In columns 2 and 5 we exclude 2012 from the sample. In columns 3 and 6 we include province-year fixed effects.

Table A11: Test for spillover effect

	Total spending (1)	Capital spending (2)	Construction & waste management (3)	Waste tax (4)
<i>Panel A: neighbours sharing border</i>				
Infiltration	0.000 (0.023)	0.030 (0.078)	0.069*** (0.023)	-0.037** (0.016)
Observations	17,404	17,363	17,315	15,283
R-squared	0.527	0.372	0.197	0.552
<i>Panel B: neighbours within 1km</i>				
Infiltration	-0.002 (0.023)	0.022 (0.078)	0.070*** (0.023)	-0.038** (0.016)
Observations	17,016	16,975	16,927	14,930
R-squared	0.522	0.371	0.197	0.551
<i>Panel C: neighbours within 5km</i>				
Infiltration	-0.003 (0.024)	0.017 (0.080)	0.071*** (0.024)	-0.039** (0.017)
Observations	14,457	14,420	14,379	12,624
R-squared	0.515	0.372	0.198	0.546
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes
Exclusion Y2012	Yes	Yes	Yes	Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Dependent variables are construction and waste management (columns 1 to 3), waste tax (columns 3 to 6) and total spending per capita (columns 6 to 9). Panel A: all municipalities sharing a border with those dissolved between 1998 and 2016 are excluded from the sample; Panel B: all municipalities within 1km from dissolved ones are excluded from the sample; Panel C: all municipalities within 5km from dissolved ones are excluded from the sample. Sample of municipalities of Calabria, Campania and Sicily. All estimations are conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. In all estimations we exclude 2012 from the sample.

Table A12: Violent attacks to politicians and infiltration

	<i>Infiltration</i> (1)	<i>One year before infiltration</i> (2)
Attacks to politicians	0.00931 (0.0126)	-0.00769 (0.00977)
Observations	9,232	7,901
R-squared	0.612	0.194
Municipality dummies	Yes	Yes
Year dummies	Yes	Yes
Controls at baseline	Yes	Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Test for correlation between violent attacks towards politicians and infiltrations. 'Attacks to politicians' is equal to 1 if there has been violence against local administrators in a given municipality. 'Infiltration' is the infiltration dummy. Estimation conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Period: 2010 to 2016.

Table A13: Violent attacks to politicians and public finances

	<i>Construction & waste management</i>		<i>Waste tax</i>	
	(1)	(2)	(3)	(4)
Attacks to politicians	0.015 (0.022)	0.008 (0.023)	-0.017 (0.018)	-0.016 (0.018)
Observations	7,680	7,680	6,204	6,204
R-squared	0.326	0.344	0.616	0.635
Municipality dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes
Province*Year FEs		Yes		Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. 'Attacks to politicians' is an indicator equal to 1 if there has been violence and/or intimidations against local administrators in a given municipality. Dependent variables are construction and waste management (columns 1 to 3) and waste tax (columns 3 to 6). Period: 2010 to 2016. Sample is composed by municipalities of Calabria, Campania and Sicily. We exclude dissolved municipalities. Estimations are conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. Columns 2 and 4 include province-year fixed effects.

Table A14: Infiltration and public finances, controlling for political factors

	<i>Construction & waste management</i>			<i>Waste tax</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Infiltration	0.048** (0.023)	0.048** (0.022)	0.056** (0.023)	-0.035** (0.014)	-0.034** (0.014)	-0.040*** (0.015)
Single candidate	-0.006 (0.018)	-0.004 (0.018)	-0.007 (0.018)	0.005 (0.018)	0.008 (0.019)	0.002 (0.019)
Last mandate	0.001 (0.005)	0.001 (0.005)	0.001 (0.005)	0.004 (0.004)	0.004 (0.004)	0.004 (0.004)
Centre right	-0.010 (0.009)	-0.010 (0.009)	-0.007 (0.009)	0.018** (0.009)	0.018** (0.009)	0.019** (0.009)
Centre left	-0.007 (0.009)	-0.007 (0.009)	-0.007 (0.009)	0.023** (0.0093)	0.023** (0.0093)	0.023** (0.0094)
Observations	22,636	22,520	21,468	20,139	20,023	19,032
R-squared	0.197	0.199	0.201	0.541	0.540	0.546
Mean Y	0.34	0.34	0.34	0.18	0.18	0.18
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Controls for regional/provincial govt		Yes	Yes		Yes	Yes
Exclusion Y2012			Yes			Yes

Note: Clustered standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Infiltration is an indicator equal to 1 capturing the period of criminal infiltration within the local governments. Dependent variables: capital spending for construction and waste management (columns 1 to 3), waste tax (columns 3 to 6). Single candidate takes value 1 if only one candidate is running for elections; Last mandate takes value 1 if the incumbent is running for the second and last mayoral mandate; Centre right/ centre left/centre party take value 1 for the political colour of the winning party. When controls for regional/provincial govt are included, the estimates also include dummy variables taking value 1 if the regional or provincial government is ruled by a left-wing party. Sample: municipalities of Calabria, Campania and Sicily, over the period 1998-2015. All estimates are conditional on municipal fixed effects, year fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies: population (log), unemployment share, employment share in manufacturing, employment share in services, employment share in agriculture, share of high school degree holders. In columns 2 and 4 we control for the colour of the provincial and regional government. In columns 3 and 6 year 2012 is excluded.

Table A15: Robustness checks - secondary results

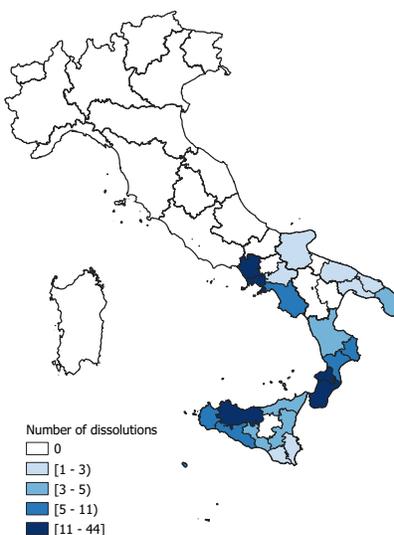
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A - Dep. var.: Public transport & lighting</i>						
Infiltration	-0.034** (0.016)	-0.026 (0.017)	-0.035** (0.016)	-0.029* (0.015)	-0.042*** (0.016)	-0.024 (0.015)
Observations	3,657	21,344	21,455	21,479	17,279	22,582
R-squared	0.224	0.201	0.201	0.201	0.204	0.178
<i>Panel B - Dep. var.: Administration</i>						
Infiltration	-0.013** (0.006)	-0.013** (0.006)	-0.012* (0.006)	-0.013** (0.006)	-0.014** (0.006)	-0.011* (0.005)
Observations	3,681	21,502	21,614	21,638	17,397	22,744
R-squared	0.685	0.730	0.730	0.730	0.726	0.709
<i>Panel C - Dep. var.: Total taxes</i>						
Infiltration	-0.027** (0.013)	-0.035*** (0.013)	-0.033*** (0.012)	-0.030*** (0.011)	-0.028** (0.012)	-0.018 (0.012)
Observations	3,712	21,680	21,792	21,816	17,546	22,941
R-squared	0.551	0.623	0.624	0.624	0.629	0.581
<i>Panel D - Dep. var.: Debt</i>						
Infiltration	0.073 (0.045)	0.131** (0.051)	0.088* (0.046)	0.124*** (0.045)	0.106** (0.045)	0.109** (0.042)
Observations	3,715	21,698	21,810	21,834	17,555	22,960
R-squared	0.864	0.721	0.721	0.722	0.683	0.706
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Exclusion Y2012		Yes	Yes	Yes	Yes	Yes
Province*Year FEs		Yes	Yes	Yes	Yes	Yes
Matching	Yes					
Excl.same mayor pre-diss		Yes				
Selection correction			Yes			
PBS				Yes		
Spillover					Yes	
Local politics						Yes

Note: Clustered standard errors at municipality level in parenthesis; *** p<0.01, ** p<0.05, * p<0.1. The analysis compares the current spending components of non-infiltrated government with infiltrated governments, before and during the infiltration. Commissioning period and post-commissioning years excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. The dependent variables are yearly capital expenditure spending for Transport and public lighting (Panel A); current expenditure for administration (Panel B); total taxes (Panel C); debt (toward third parties (Panel D)). All estimations are conditional on municipal fixed effects, years fixed effects and controls at baseline interacted with time dummies. Controls: population (log), unemployment share, employment share in manufacturing, employment share in agriculture, employment share in services, share of high school/tertiary degree holders. Column (1) performs the analysis on the matched sample of 232 municipalities. From column (2) onwards we exclude year 2012 and we include province*year fixed effects. When the infiltration period coincides with the second term of the mayor, we drop from the sample years which correspond to the first mayoral term, Column (2). Column (3) drops municipalities whose dissolution was explicitly related to anomalies in the balance sheets. Column (4) controls for election year fixed effects. Column (5) control for spillovers. Column (6) include local electoral characteristics as control. Expect column (1), matched sample, all other analysis exploit our main sample of 1350 municipalities of Campania, Calabria and Sicily.

Appendix B

Law 164/1991 - additional evidence

Figure B1: Number of dissolutions by province



Note: Source: Italian Ministry of Interior, authors' own elaboration. The figure reports the number of dissolutions over the period 1998 to 2018. Sicily: Agrigento (8), Caltanissetta (3), Catania (4), Messina (3), Palermo (21), Ragusa (2), Siracusa (1), Trapani (5). Campania: Avellino (2), Caserta (16), Napoli (29), Salerno (5). Calabria: Catanzaro (9), Crotona (7), Cosenza (3), Reggio Calabria (44), Vibo Valentia (20). Apulia: Bari (1), Brindisi (1), Foggia (4), Lecce (3), Taranto (1)

Table B1: Typologies of infiltration - dissolution reports

	Mean	Std dev
Direct infiltration	0.27	0.49
Indirect infiltration	0.73	0.49
Direct infiltration with detected intimidation	0.06	0.24
Indirect infiltration with detected intimidation	0.14	0.35

Note: The table classifies the most common typologies of infiltrations. Information comes from gazzettaufficiale.it

Table B2: Characteristics of colluded mayors

	Mean	SD	p10	p50	p90
<i>Age, gender and place of birth</i>					
Age	50.36	9.76	38.00	50.00	64.00
Female	0.03	0.17	0.00	0.00	0.00
Born in city	0.66	0.47	0.00	1.00	1.00
Born in province	0.79	0.40	0.00	1.00	1.00
Born in region	0.95	0.21	1.00	1.00	1.00
Born abroad	0.02	0.15	0.00	0.00	0.00
<i>Education</i>					
Primary	0.00	0.07	0.00	0.00	0.00
Lower Secondary	0.02	0.14	0.00	0.00	0.00
Upper Secondary	0.34	0.47	0.00	0.00	1.00
University	0.60	0.49	0.00	1.00	1.00
Years of Education	15.50	3.84	13.00	18.00	18.00
<i>Previous occupation</i>					
Managerial	0.11	0.31	0.00	0.00	1.00
Highly-Specialised	0.29	0.46	0.00	0.00	1.00
Technical	0.18	0.39	0.00	0.00	1.00
Tertiary	0.23	0.42	0.00	0.00	1.00
Commerce and Services	0.02	0.15	0.00	0.00	0.00
Craftsmanship	0.01	0.10	0.00	0.00	0.00
Conductors	0.01	0.11	0.00	0.00	0.00
Other	0.08	0.26	0.00	0.00	0.00
<i>Tenure</i>					
Number of terms	1.43	0.61	1.00	1.00	2.00
Term limit	0.34	0.48	0.00	0.00	1.00

Note: The table provides descriptive statistics of the mayors of dissolved municipalities. Source: Census of Local Administrators amministratori.interno.gov.it/amministratori/index.html

Main reasons behind dissolutions. In Table B1 we classify the most common reasons behind the dissolutions of local governments because of criminal capturing. We do this on the basis of the dissolution reports publicly available from the *Gazzetta Ufficiale dello Stato*. The exercise is suggestive in its nature as it is subject to measurement error. It is not straightforward to identify one main typology of infiltration as, in many cases, they are not mutually exclusive.

Direct infiltrations denote instances of mafia affiliates being personally part of a local government. *Indirect infiltrations* are cases where the criminal organisations do not directly place one of their members within the local government, but they manage to exert a significant influence on its composition and policy decisions. This form of capturing is very heterogeneous and it can take a variety of forms. Here we provide a non-exhaustive list of

some of the most common typologies.

- *Unexpected public appearances.* These include all instances where there have been unexpected public appearances of criminal mobsters with local administrators (mayor participating to the wedding of a local *mafioso*, dinner between administrators and local mobsters, public parties with the presence of criminal affiliates, etc.). One example is the city of Crispano (Campania), where “*a symptomatic event [of the infiltration] was the delivery [during] the celebrations [...] in the presence of the mayor, of a letter with which a well-known exponent of a prominent organised crime group, through the public expression of good wishes for the event, reiterated his hegemonic role*”.⁴⁸
- *Mayor-mafia direct involvement.* The mayor can be directly involved in the cases of collusion. In Gricignano di Aversa (Campania), “*the mayor has concluded a pre-election agreement in which he promised future financial benefits to the local camorra clan in exchange for electoral support*”.⁴⁹
- *Vote-buying events.* Infiltrations can occur through bribes in exchange for electoral favours. This is the case of Seminara (Calabria), where “*the mafia clan’s commitment continued throughout the election campaign through a vote-buying action capable of influencing and controlling the will of the voters.*”

Less common (or more likely simply less reported) are all the instances of threats towards the mayor and or the local administrators. These intimidations are more rarely associated with direct infiltration and more commonly correlated with more indirect form of capturing such as in the case of the city of Niscemi, within the province of Caltanissetta, where the report states that “*the municipality was affected by further criminal episodes,*

⁴⁸gazzettaufficiale.it/eli/id/2005/11/11/05A10535/sg

⁴⁹Full report available at: gazzettaufficiale.it/eli/id/2010/08/21/10A10389/sg

such as damage to the service car of the mayor and the burning of the private car of one of the councillors, as well as acts of intimidation against a municipal employee".⁵⁰

Mayors' characteristics. In Table B2 we descriptively explore the characteristics of the mayors of dissolved local governments. It is interesting to see that the overwhelming of them are men and they are *local*, in that they are either born in the same city or in the same province/region. The average age is 50 years old and the most common professional background is highly specialised (mostly doctors or notary) or coming from the tertiary sector and mostly services.

Technocratic national government. As shown in Figure 2, during the technocratic national government in 2012, a significant number of municipalities have been dissolved. In addition of excluding the year 2012 in all our tables, we report here an additional test where we exclude from the sample all those treated municipalities whose dismissal has been implemented during the technocratic government which ended with the general elections in February 2013. We focus on our two main results and, in Table B3, we show that the estimates are robust to the exclusion of these municipalities in our baseline model, when exploiting the matched sample and when expanding the dataset to Apulia and Basilicata.

⁵⁰gazzettaufficiale.it/eli/id/2004/05/17/04A05056/sg

Table B3: Excluding treated municipalities dissolved in 2012

	<i>Construction & waste management</i>			<i>Waste tax</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
Infiltration	0.0580** (0.0229)	0.0543** (0.0233)	0.0504** (0.0210)	-0.0302* (0.0156)	-0.0288* (0.0173)	-0.0282* (0.0151)
Observations	22,653	3,618	29,510	20,163	3,214	26,924
R-squared	0.197	0.251	0.201	0.539	0.546	0.578
Mean Y	0.34	0.34	0.34	0.18	0.18	0.18
Municipality dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Controls at baseline	Yes	Yes	Yes	Yes	Yes	Yes
Matched Sample		Yes			Yes	
Apulia and Basilicata			Yes			Yes

Note: Clustered standard errors at municipality level in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The analysis replicates our main results excluding all treated municipalities whose dissolution has been implemented in 2012. For treatment municipalities, commissioning period and years the commissioning period are always excluded. Infiltration is a dummy equal to 1 if the government is infiltrated by organised crime. Dependent variables are construction and waste management (columns 1 to 3) and waste tax (columns 3 to 6). Sample of municipalities of Calabria, Campania and Sicily. All estimations are conditional on municipal fixed effects, year fixed effects, election years fixed effects and controls at baseline interacted with year dummies. Controls at baseline (1998) interacted with year dummies.

Appendix C

Italian municipalities: institutional details and public finances

- *Italian municipalities.* As of 2016, the year when our time span ends, there were 8,010 municipalities in Italy, 1,350 of which are found in the three regions of Campania, Calabria, and Sicily, while 388 are in Apulia and Basilicata. The institutional setting of the municipalities is centred on the figure of the mayor, who heads the local government and leads along with the legislative body, the local council, and the executive body, the local *giunta*. The mayor and members of the council are elected together by resident citizens. The *giunta* is chaired by the mayor, who appoints its members. Elections of local councils are staggered over time and not held at the same time for all municipalities.
- *Public spending components.* In the Financial Statements of the Italian Ministry of Interior, municipal expenditures (current and capital) are sub-divided into several different chapters of spending. The main ones are: (1) general functions of administration, including all expenses related to the management of offices coordinating the internal activities of the municipality; (2) social sectors, including all expenses for the provision of social services and the creation of infrastructure to that aim (kindergartens, retirement homes, rehab centres); (3) construction and waste management (called "Territorio e ambiente" in the Certificati Consuntivi), referring to all expenses for urban planning - adoption of construction plans and building regulations, maintenance and construction of all new buildings (all part of capital account spending), construction of housing, maintenance and management of the local territory, waste collection and disposal; (4) public transport and lighting, including expenses

to guarantee local public transportation, public lighting, management of road traffic; (5) public education, including all expenses for all education infrastructure, school maintenance and school transportation; (6) functions of local police, including the acquisition and maintenance of goods and equipment, cars and office structures.⁵¹

The average per capita spending in the municipalities of Calabria, Campania, Sicily over the 1998-2016 period corresponds to 566 euros per inhabitant for the capital account and 753 euros for the current account. Summing up these two figures we obtain the average total spending per municipality, 1,320 euros per inhabitant. As shown in table A2, the spending function to which the most annual resources are allocated is construction and waste management, which makes up 34% of the annual capital expenditure budget. As for the current account, spending is highest for administration, followed by construction and waste management. The municipalities are also responsible for tendering and awarding public procurement contracts to the contractor company in charge of carrying out the work.

Data collection. The data collection has been completed in two phases. First, for the municipalities of Calabria, Campania and Sicily for years 1998 to 2013, we have received data directly from the Ministry of Interior (division of Local Finance) in late 2015. Two spending items, current expenditure in education and public transport, did not have data fully reported for respectively years 2002/2010 and year 2012. We have collected this information directly from the website of the Ministry of Interior.

Second, we have complemented this dataset with information a) for the municipalities of Calabria, Campania and Sicily for the years 2014, 2015 and 2016 and b) for the municipalities of Apulia and Basilicata for the years 1998 to 2016. We have collected this data directly from the website of the Ministry of the Interior with an

⁵¹The additional chapters of spending are (1) culture, (2) justice, (3) services and (4) sport.

extraction dated December 2020.⁵²

- *Municipal revenues.* Revenues of municipalities are composed of two broad categories: (1) fiscal revenues from taxes (*entrate tributarie*) and (2) transfers + non-fiscal revenues. The former category is subdivided into several different sub-categories, of which by far the most important are: the property tax (formerly called ICI, now IMU), i.e. a tax paid by any household for real estate ownership, and the waste tax (*tassa per lo smaltimento dei rifiuti solidi urbani*), a tax paid by citizens for the service of waste collection provided by the municipality. Property taxes are collected in the following way. From 1998 to 2007 we collect the variable *ICI*. From 2008 to 2011, the accounting of the Italian municipalities changes, and reports reports "*ICI abitazione principale*" and "*ICI su fattispece diversa abitazione principale*". For these years we use the sum of these two items. In 2012 the balance sheet reports "*IMU abitazione principale*" and "*IMU su fattispece diversa abitazione principale*". For this year, we take the sum of these two items. From 2013 to 2016 we take the total, "*Imu - imposta municipale propria*".

As far as the waste tax is concerned, from 1993 until 2012 it was called TARSU, then TARES, now from 2014 TARI. Its rate depends exclusively on the size of a house and the number of components of each household, not on the amount of waste produced. In this sense, its amount does not depend on the quality of service provided (but the citizens' willingness to pay it might). The amount of money a municipality collects from the waste tax cannot be higher than what it spends on waste management services. Municipalities have some room for modifying the tax. The base waste tax rate is one per thousand, and from 2014 its maximum has been set to three per thousand. Other minor taxes municipalities can independently collect are taxes on advertise-

⁵²finanzalocale.interno.gov.it/apps/floc.php/in/cod/4.

ment on public soil, and taxes on temporary usage of public spaces.

It is not uncommon that the actual collected revenues, "riscossioni conto competenza," is listed as zero directly in the Financial Certificates. In these cases, the amount of municipal collected revenues reported by the Ministry of Interior is zero and our dependent variable, which is the ratio between collected revenues and the total amount of forecasted revenues the municipality expects to collect within the budget year, is equal to zero.

The category of transfers + non-fiscal revenues includes, among others, any transfer from provinces, regions, the national government, or any other public institutions for the services provided by municipalities (law enforcement, schooling, sport and touristic events, elections, etc.).

Data collection. The data collection has been completed in two phases. First, for the municipalities of Calabria, Campania and Sicily for years 1998 to 2013, we have received data directly from the Ministry of Interior (division of Local Finance) in late 2015.

Second, we have complemented this dataset with information a) for the municipalities of Calabria, Campania and Sicily for the years 2014, 2015 and 2016 and b) for the municipalities of Apulia and Basilicata for the years 1998 to 2016. We have collected data directly from the website of the Ministry of the Interior with an extraction dated December 2020.⁵³ Data on debt toward other parties and deficit have been collected for all our regions and all years directly from the website of the Ministry of Interior in January 2021.

⁵³finanzalocale.interno.gov.it/apps/floc.php/in/cod/4.