

RESEARCH ARTICLE

Mafia doesn't live here anymore: Antimafia policies and housing prices

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Abstract

It is well known that the value of a house depends both on the physical characteristics and on some features of the neighborhood in which it is located. If so, organized-crime activities can significantly affect urban real estate values. Antimafia policies, in turn, can be intended as a tool to influence those external features. This paper compares the effects on real estate values of the two main antimafia policies implemented in Italy since the 1990s at the municipal level. While we do not find any significant effect of dismissal policies on house prices, we find a statistically significant effect of reassignment policies depending on the specific destination of confiscated property.

KEYWORDS

antimafia policies, Italy, organized crime, real estate

1 | INTRODUCTION

According to a large body of literature, heterogeneous goods like residential properties have intrinsic (i.e., structural characteristics of a building) and external attributes (i.e., environmental and public amenities) that contribute to determine their final price (Rosen, 1974). Housing values, for instance, reflect the value buyers attach to both the property in itself and the surrounding area. Hedonic pricing models are commonly used in empirical studies to estimate the implicit contribution of each attribute, whose changes are a possible channel of fluctuations in real estate prices.

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In this perspective, a robust and long-standing literature has shown that high crime levels tend to depreciate residential property values,¹ yet the impact of organized crime on housing prices has notably been neglected. However, it is reasonable to assume that even organized crime and local governments' efforts to eradicate it could affect the housing market value. Bradbury (2022) argues that subsidization policies concerning properties (like, stadiums and sport venues) end up affecting that area's real estate values, through the channel of variation in amenity stock. The endemic presence of criminal organizations has been proven to create severe economic distortions in many instances. Apart from curbing the growth path of the regions where they operate (Pinotti, 2015), criminal organizations successfully manage to infiltrate society thereby undermining competitive markets (Calamunci & Drago, 2020; Ferrante, Fontana, et al., 2021a) as well as politics (Daniele & Geys, 2015; De Feo & De Luca, 2017). But improvements in law enforcement and public efficiency may curb the deleterious influence of organized crime on society (Berrittella, 2018).

In accordance with this approach, in this article, we investigate the effects on real estate values of two key antimafia policies implemented in Italy during the 1990s: the dismissal of city councils for mafia infiltration—henceforth, DC policy—and the reassignment of confiscated assets formerly owned by mafia members—SR policy. The DC policy and the SR policy starkly differ in their content: the former has political implications insofar as the dissolution of the municipality imposes new elections, whereas the latter has an economic dimension, in that it reduces mafia wealth and implies a new life for reallocated properties. In this instance, the enactment of SR policies may somehow translate into an urban regeneration measure, and as such have more direct repercussions on the public amenity stock of the urban area depending on the reallocation purpose. Despite measuring a latent phenomenon as organized crime presence poses both technical and conceptual challenges (Costa, 2010), the enforcement of legislative measures intended to fight mafia groups may provide a unique opportunity to isolate their influence on property values.

While the aforementioned technical and conceptual challenges are acknowledged, our empirical analysis does achieve robust findings. More precisely, the main results are as follows. (1) DC policies do not appear to have any significant impact on house prices. (2) The impact of SR policies depends on the specific destination of confiscated property. Among the different types of reassignment policies, those to (2a) public institutions show a negative effect in more mafia-ridden areas, whereas those to (2b) social institutions always display a positive impact. Hence, in accordance with our theoretical underpinnings, we interpret our empirical evidence as a preliminary confirmation that it is the social reuse of formerly mafia-owned properties that drives residential prices up insofar as it implies an increase in public amenities.

We argue that the dichotomous result on SR reassignments stems from the peculiar and pervasive nature of mafia-type organizations in Italy. As cogently explained by Judge Giovanni Falcone: “The mafia, system of power, articulation of power, metaphor for power, pathology of power. The mafia that becomes a state where the state is tragically absent” (Falcone, 1991—our translation from Italian). His view was that the mafia not only affects economic and political institutions, but also social capital, moral values, and the sense of trust of entire communities. This is one of the reasons for the strong penetration of mafia organizations into the economic, political, and cultural fabric in Italy.² The mafia exploits the weaknesses of the state and, in turn, the state loses its legitimacy and authority over the population.

¹For instance, Lynch and Rasmussen (2001) report a significant reduction in the average housing prices in areas characterized by high crime rates. Pope and Pope (2012) estimate a substantial increase in house prices during the American crime drop of the 1990s. More in detail, the type of criminal offense seems to matter. Crimes that convey the feeling of neighborhood deterioration, such as vandalism and graffiti, have a more robust impact on domestic property values than burglary or theft (Gibbons, 2004). And, as observed by Ihlanfeldt and Mayock (2010), only the most violent offenses, such as robbery and aggravated assault crimes, can influence real estate prices. Besides, violent crimes appear to hit low-income neighborhoods more severely, as shown by Tita et al. (2006).

²For instance, one of the most negative economic consequences of the presence of mafia-type organizations is a socioinstitutional context unfavorable to foreign direct investments (Daniele & Marani, 2011).

We deem our empirical results to be closely in line with this reasoning. As for the specific mechanism underlying our empirical evidence, however, we acknowledge that clear-cut evidence is far from being achieved in the current analysis. Having said that, it is worth noticing that the statistical significance of the SR policy versus that of the DC policy signals a higher efficiency of policies with apparent economic content. We conjecture some potential mechanisms are compatible with the observed empirical results, based on the reduction of the mafia power in general, as well as on the increase in local investments and urban regeneration process, mainly due to the more efficient (re)use of seized mafia assets.

We further conjecture that antimafia policies alone may not be enough. And, as far as house prices are concerned, SR policies may even be detrimental when something beyond the effort of the state and the judicial system is not done. The reason might be twofold. First, in a territory plagued by criminal activity and degradation, where the high levels of public corruption hinder the quality of public services and social capital (Corrado & Rossetti, 2018), local governments tend to have no political credibility, thus the reallocation of resources to public institutions may be viewed by citizens as a simple change of ownership between criminal and corrupt actors. As stressed by Van Dijk (2007), the mafia has the pernicious ability to erode the integrity and conduct of local public servants. This may explain why the reassignment to public institutions can be perceived not only as an inconclusive arrangement but also as a potential driver of urban degeneration.

The second reason is that the reallocation of confiscated assets may only appear on paper and not be actually implemented, at least not for many years or adequately, because of red tape or other forms of bureaucratic inefficiencies. And this seems to be particularly true whenever properties are reassigned to public purposes. In a survey carried out in Sicily by two local volunteer organizations, *Arci Sicilia* and *Siciliani Giovani*, it is reported that most of the assets confiscated and reassigned (on paper) to public institutions are either abandoned or poorly managed.³ The presence of underutilized or vacant properties may contribute to create an image of urban decay, causing a reduction in the demand from homebuyers.

In contrast, the reassignment of confiscated assets to social institutions, which is directed towards organizations that are already established and active in a territory, makes it more likely for the reassigned resources to be put to their intended use and contribute to urban regeneration and community revitalization, usually followed by an increase in house prices. The main beneficiaries of reallocated assets are nonprofit organizations and, in particular, social cooperatives (Law 109/1996).

These nonprofit associations, through volunteer work, provide a wide array of services and welfare support to citizens, create job opportunities, and promote entrepreneurship. Social cooperatives tend to operate on a local level, but they often engage in trust networks with other nonprofit actors in the same geographical area (Thomas, 2004). The emergence of these bottom-up, self-organized social enterprises has proved to be crucial to the success of public policies concerned with the regeneration of real estates (Mangialardo & Micelli, 2016). On a wider scale, despite this extremely difficult context, in recent years, single activists and small civic associations have played a fundamental role in the reaction against the mafia in Italy. The primary objective of such initiatives is to promote the sense of civic consciousness, justice, and rejection of criminal culture, through participatory projects and grassroots movements. In many cases, these antimafia initiatives and associations have achieved considerable success.⁴

Our paper adds to the existing literature in several crucial areas. First, we contribute to the rising stream of literature concerned with the assessment of the measures undertaken to fight organized crime in Italy by providing a comparison of the effectiveness of antimafia policies with different contents. Other works investigate the effects

³<http://www.linformazione.eu/2020/09/sicilia-beni-confiscati-alla-mafia-rischio-flop/>

⁴One example of successful civic resistance to *cosa nostra* in Sicily is represented by *Addiopizzo*, an antimafia organization that offers direct and indirect (political) support to those entrepreneurs who decide not to pay protection money or other forms of extortion. The term *Addiopizzo* can be translated as Goodbye pizzo, that is, a term originating from the Sicilian dialect and referring to the protection money that mafia extorts from local businesses. See Elsenbroich (2017) and Vaccaro and Palazzo (2015).

of antimafia interventions on several markets or contexts. For example, Acconcia et al. (2014) exploit the DC policy to show its enactment affects curbs public spending at the provincial level. Daniele and Geys (2015) find that the implementation of DC policies increases the average education level of local politicians, but they do not consider the possible indirect effect of SR policies. Galletta (2017) shows that in municipalities nearby those subjected to DC policies, there is a lower incidence of crimes involving the mismanagement of public resources. Operti (2018) reports an increase in the number of market entrants after the confiscation orders of economic assets. Di Cataldo and Mastroiocco (2022) provide evidence of a distortion in the allocation of public funds to the advantage of mafia's entrepreneurial interest in municipalities where DC policies are later enacted. Calamunci et al. (2022) find that in mafia-infested municipalities, SR policies targeting firms have a positive spillover effect on the commercial property market. Fenizia and Saggio (2022) analyze the long-term impact of the DC policy, and show that municipalities whose city council has been dissolved for mafia infiltration experience a decrease in unemployment, as well as an improvement in the management of public funds and tax compliance.

Our paper is also close to Esposito and Ricci (2015), who focus on the social reuse of confiscated assets, and show that it can be a powerful tool for turning public disvalue into public value. The authors however do not consider the different types of reassignment uses, and the potential influence of DC policies. The two papers Ferrante, Fontana et al. (2021a) and Ferrante, Reito, et al. (2021b), on the other hand, consider both DC and SR policies and argue that only the latter has a positive impact on the degree of competition, respectively, in the construction industry and in electoral outcomes. Other types of antimafia measures have been introduced in Italy over the years. Some have proven to be rather ineffective or even harmful. For instance, Scognamiglio (2018) studies the effects of Law 1423/1956 that, between 1956 and 1988, forced *mafiosi* to relocate to other cities in Italy, and reports a positive correlation with the employment in the construction industry in the regions of destination, suggesting the creation of new illegal market opportunities.

Second, we contribute to the urban literature by linking house prices with a new context, such as organized crime and assets reallocation. With the exception of the abovementioned contribution of Calamunci et al. (2022), as well as that of Battisti et al. (2022), who investigate the impact of mafia-type organized crime on residential property values in the city of Naples and find that Camorra murders involving innocent people drive housing prices down by 2.5%–3.8%, the existing empirical literature has overlooked the nexus between organized crime and property prices in Italy. In this perspective, we focus on the effects of the SR and DC policies on the economic sphere and at a local level and expand the scope of our analysis to the entire Italian territory. In particular, we analyze the impact of antimafia policies on urban property values using a very large data set of over 26,000 observations, from 2002 to 2019, and related to all Italian municipalities affected by at least one antimafia intervention. The peculiarity of our contribution consists in showing how only antimafia policies targeting the economic power of organized crime positively affect residential prices. And what is pivotal in determining this final effect is the reuse step of the SR policy, and more specifically, the type of reassignment. Our results indeed suggest that when the confiscated assets are returned to the local community for social purposes, then a process of urban regeneration takes place, restoring the amenity stock and ultimately driving residential prices upwards. On the contrary, in contexts tainted by the mafia, reassignments to public institutions turn out to be unsuccessful, as they lead to a decrease in house prices.

Lastly, another novelty of our paper comes from the use of the latest methodologies based on difference-in-differences (DiD) (de Chaisemartin & d'Haultfoeuille, 2022a; Goodman-Bacon, 2021), also shifting the analysis from the binary to the continuous context (de Chaisemartin & D'Haultfoeuille, 2022a, 2022b).

The rest of the paper is as follows. Section 2 outlines the institutional background. Section 3 describes data and Section 4 presents the estimation strategy. Section 5 discusses the results. Section 6 focuses on the potential underlying mechanisms driving our results. Section 7 provides a series of robustness checks in the form of both diagnostic tests and alternative estimators. Section 8 concludes.

2 | INSTITUTIONAL BACKGROUND

2.1 | Antimafia policies: DC and SR

The rise of mafia-type criminal organization in Italy traces back to the years following the Italian Unification (1861)⁵ and was originally tied to the provision of protection services for agricultural lands in the southern regions (Skaperdas, 2001). Organized crime groups have evolved over the years, becoming a pervasive entity to the social, economic, and political fabric using violence and extortion, particularly in the prosperous years after the Second World War (Lupo, 2009). As the economic boom opened many revenue opportunities to exploit whom organized crime groups started infiltrating the legitimate economy and political sphere, the power of criminal organization became a concern to the Italian State—despite its attempt to curb the spread of mafia infiltration may have not always have appeared consistent (Arlacchi, 1983; Paoli, 2003; Shelley, 1994). The crime of mafia-type association, however, will be introduced in the Italian Penal Code only in 1982, with the Rognoni-La Torre act (Law 646/1982), which also disposes of the confiscation of illicit assets owned by mafia members. The 1990s saw a massive enforcement of this piece of legislation, in conjunction with Law 221/1991, providing for the dissolution of city councils for mafia infiltration. The implementation of these two antimafia policies represented a turning point in the fight against organized crime aiming at undermining both its political influence and its economic power.

The SR policy is regulated by Law 646/1982 and Decree 159/2011 (*Codice antimafia*). Both pieces of legislation provide that the judicial authority can order the seizure and reassignment of property owned by members of criminal organizations when there is evidence that they are the result of illegal activities. The policy is implemented by court, on the recommendation of the Public Prosecutor's Office or the Police Authority, which, in Italy, are independent of the political government. The seized assets are entrusted—from seizure to first-degree confiscation (phase 1)—to the judicial administrator, appointed by the court at the same time as the seizure order, and—from first-degree confiscation to destination (phase 2)—to the National Agency of Confiscated Assets (*Agenzia Nazionale per l'amministrazione e la destinazione dei Beni Sequestrati e Confiscati alla criminalità organizzata*—ANBSC). The agency, through its Board of Directors, must determine new destinations for the assets, and several new uses or purposes are possible according to Law 109/1996. For what concerns this paper, the relevant four broad categories are:

- Public institutional purposes, which mainly refer to the reassignment to local bodies of public administration, such as civic offices, municipal museums, and other public spaces.
- Social institutions, such as nonprofit charitable organizations, day-care centers, cultural centers, and social cooperatives.
- Governmental uses, which are essentially related to justice, law enforcement, and public order, such as police stations, military bases, and fire stations.
- Asset selling or firm foreclosure. The sale of confiscated assets or companies is regulated by Decree-Law no. 230/1989 (and then Law 282/1989). Almost all confiscated companies are foreclosed (889 out of 959 in our sample).⁶

The DC policy was introduced by Decree-Law 164/1991 (then Law 221/1991) and is currently regulated by Article 143 of the Consolidated Law of Local Authorities (*Testo Unico degli Enti Locali*). Increasing evidence of mafia infiltration in local politics prompted the issue of a legislative measure disposing of the dismissal of municipal councils when there is concrete, unambiguous, and relevant evidence that local bureaucrats are affiliated to or influenced by criminal organizations. The application of DC policies consists of the following steps. The provincial

⁵On the historical origins of the mafia in Italy, see Gambetta (1993), Bandiera (2003), and Buonanno et al. (2015).

⁶See also Calamunci (2022) on the deterioration in the probability of survival of mafia firms under judicial administration.

prefect orders an investigation and appoints an external, nonelected commission which draws up a report that is submitted to the prefect and then to the Minister of Interior. The Minister proposes the dissolution to the Council of Ministers and the President of the Republic. The proposal must specify the measures necessary to restore public interest. The members of the municipal council who are held responsible are removed from office. The ordinary management of the municipality is transferred to an external commission until new elections are held. Differently from the SR policy, it is interesting to note that the DC policy is implemented by bodies accountable to the Italian government (the executive power).

2.2 | Real estate market in Italy

Residential property represents the main source of wealth for households in Italy.⁷ And investment in real estate is also an activity traditionally pursued by Italian criminal organizations (Transcrime, 2013a).

Time fluctuations in housing prices may reflect many socioeconomic phenomena. This is why the indices of residential property prices are important indicators of macroeconomic growth, financial stability, and business decisions.⁸ Average residential prices more than doubled between 1950 and 2012 (Cannari et al., 2016), and the evolution of prices followed an overall increasing pattern between the 1960s and the 2010s, despite some brief trend inversions. In 2019, the revenue of the Italian residential market reached around 97.5 billion euros, with a 3.5% increase over the last year—which is mainly due to the increase in the volume of transactions (Agenzia delle Entrate, 2020).

Given the high segmentation of the real estate sector, disaggregated data on property prices may be more insightful than national average trends. The geographical areas with a traditionally prominent presence of criminal organizations, such as Calabria and Sicily, are notably those with the lowest property prices (see Figure 1). This is consistent with the literature on crime and real estate values.

Real estate is also one of the main sectors where organized crime groups invest their illicit profits thereby infiltrating the legitimate economy (Transcrime, 2013a). Investing in property is indeed a safe channel to place in legal markets the proceeds of money-laundering activities. And this appears to be a frequent practice for criminal organizations all over the world (Naheem, 2017; Nelen, 2008; Schneider, 2004) and more specifically in Italy (Dugato et al., 2015; Transcrime, 2013a). In this perspective, it is not unlikely for the pervasive presence of organized crime groups to affect real estate values. Following the reasoning of Calamunci et al. (2022), we hypothesize that the infiltration of the mafia in the real estate sector acts as a latent disamenity which curbs property prices. Thus, provided they turn out to be effective, public policies aimed at hitting organized crime and at weakening their influence and power over the local economy and politics may be expected to increase residential property values.

3 | DATA

The empirical study is conducted using two main sources and is based on a panel data set running from the second semester of 2002 to the first semester of 2019. First, we use data on property values from the Italian Estimate and Observatory on the Real Estate (*Osservatorio del Mercato Immobiliare—OMI*), published by the Italian Revenue Agency (*Agenzia delle Entrate*). This agency delivers half-yearly reports on the average maximum and minimum house sale and rent prices for inframunicipal geographical areas, that is, the so-called OMI zones, that are

⁷According to the reports of Banca d'Italia (2019), the relative share of real estate investments on total household assets is around 50%. Italians are traditionally owner-occupiers: in 2012, 80% live in a house they own (Cannari et al., 2016).

⁸For a comprehensive overview, see Cannari et al. (2016).

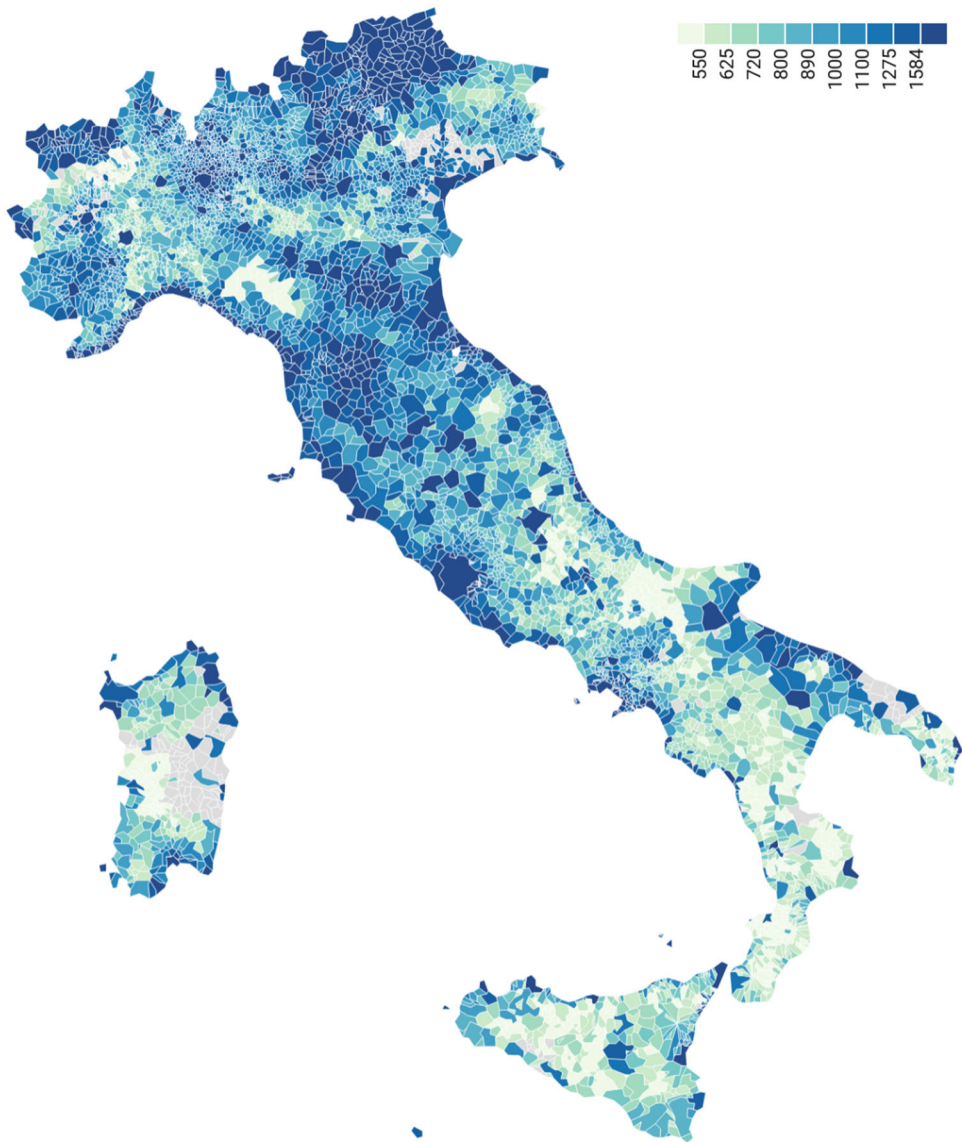


FIGURE 1 Average prices of residential houses located in B1 zones (C/m²). The figure shows the average prices of residential houses located in B1 zones across Italian municipalities in the first semester of 2019. *Source:* Our elaboration on Osservatorio del Mercato Immobiliare (OMI) data.

homogeneous from a socioeconomic standpoint. We consider only the prices of residential houses located in the city center of each municipality (B1 OMI zone).⁹ The reason is that the link between real estate values and disposable income is stronger in the city center and weaker in the suburbs, as reported by Manzoli and Mocetti (2019). This allows us to better detect the effects of antimafia policies on the price trend of a given geographical

⁹Admittedly, some municipalities not only have B1 zones, but also other zones, such as B2, B3, and so forth, which are part of historical centers. But almost every Italian municipality possesses at least the B1 zone. This is the reason why we specifically focus on B1 OMI sale and rental prices.

area. Moreover, in the city center area the possibility for urban expansion is limited. This implies that changes in property prices are more likely to result from the appraisal of preexisting houses rather than from areas and building of recent construction.

Second, the data comprehend records on the enforcement of the DC policy from the reports of the Italian Ministry of Interior, whereas data on the SR policy were gathered from Open Regio, the online portal managed by ANBSC, the National Agency for the Administration and Destination of Seized and Confiscated Assets.

As organized crime presence tends to be a latent phenomenon, there is no certainty that the cities that have never been affected by neither of the measures are actually never been infiltrated by criminal organizations. It may be the case that in those municipalities, the local mafia has not been detected and hit by law enforcement actions yet. Or on the contrary, those cities may be completely mafia-free for real. We are not able to assess whether for a municipality not experiencing any antimafia policy equates to never having suffered from mafia infiltration at some extent. Since the territorial presence of the mafia is likely to affect the price dynamics of the real estate market, to mitigate estimation biases, our sample includes only municipalities where at least one antimafia measure among the DC and the SR policy has been enacted (see Figure 2 for their geographical distribution in Italy).¹⁰ This allows us to compare the effect of the two policies considering a relatively homogeneous selection of units.

Figure 3 shows the time trends of DC and SR policies in Italy, from 1990 to 2019, while Figure 4 describes the different reallocation purposes of confiscated assets. In Italy, almost 15% of the municipalities have been subjected to at least one SR policy and less than 3% to DC policies. Most SR policies concern the reassignment to public and social institutions, whereas only a small fraction to governmental uses and asset selling.

4 | EMPIRICAL STRATEGY

The empirical identification of causal effects in the study of crime is demanding, especially as the focus shifts from individual offenders to criminal groups and from simple crimes to complicated criminal enterprises (Pinotti, 2020). In this situation, the difficulty of identification is compounded with the difficulties for researchers to perform controlled randomized tests, since it is impossible to realize due to ethical concerns.

To address this issue, a well-established stream of research focuses mostly on “quasi-experiments” that induce variation in treatment exposure, which may then be utilized to identify and investigate the impact of interest. Following this line, taking advantage of the panel structure of the data, we rely on the exogenous shock resulting from the staggered municipal-level antimafia enforcement measures (DC and SR) to study their impact on the housing market. In our analysis, the treatment is the execution of one of the two policies. We exploit the temporal variation in the enactment of these antimafia policies across municipalities to estimate the effects on residential property values. In both cases, we argue that the hypothesis of exogeneity of the treatment is sufficiently justified. We provide a more detailed discussion later in this section. Therefore, we base our approach on a staggered DiD estimation with variation in treatment timing. Specifically, we estimate the following equations:

$$GRHP_{tm} = \eta_m + \beta DC_{mt-1} + \gamma_t + \varepsilon_{mt}, \quad (1)$$

$$GRHP_{tm} = \eta_m + \delta SR_{mt-1} + \gamma_t + \varepsilon_{mt}. \quad (2)$$

More in detail, we control for the simultaneous causality between the two antimafia policies in the outcome:

$$GRHP_{tm} = \eta_m + \beta DC_{mt-1} + \delta SR_{mt-1} + \gamma_t + \varepsilon_{mt}. \quad (3)$$

¹⁰Thus, in our case, never treated units are cities in which at least one of the two antimafia policies has not been implemented yet but eventually will at some point in time during the observation period.

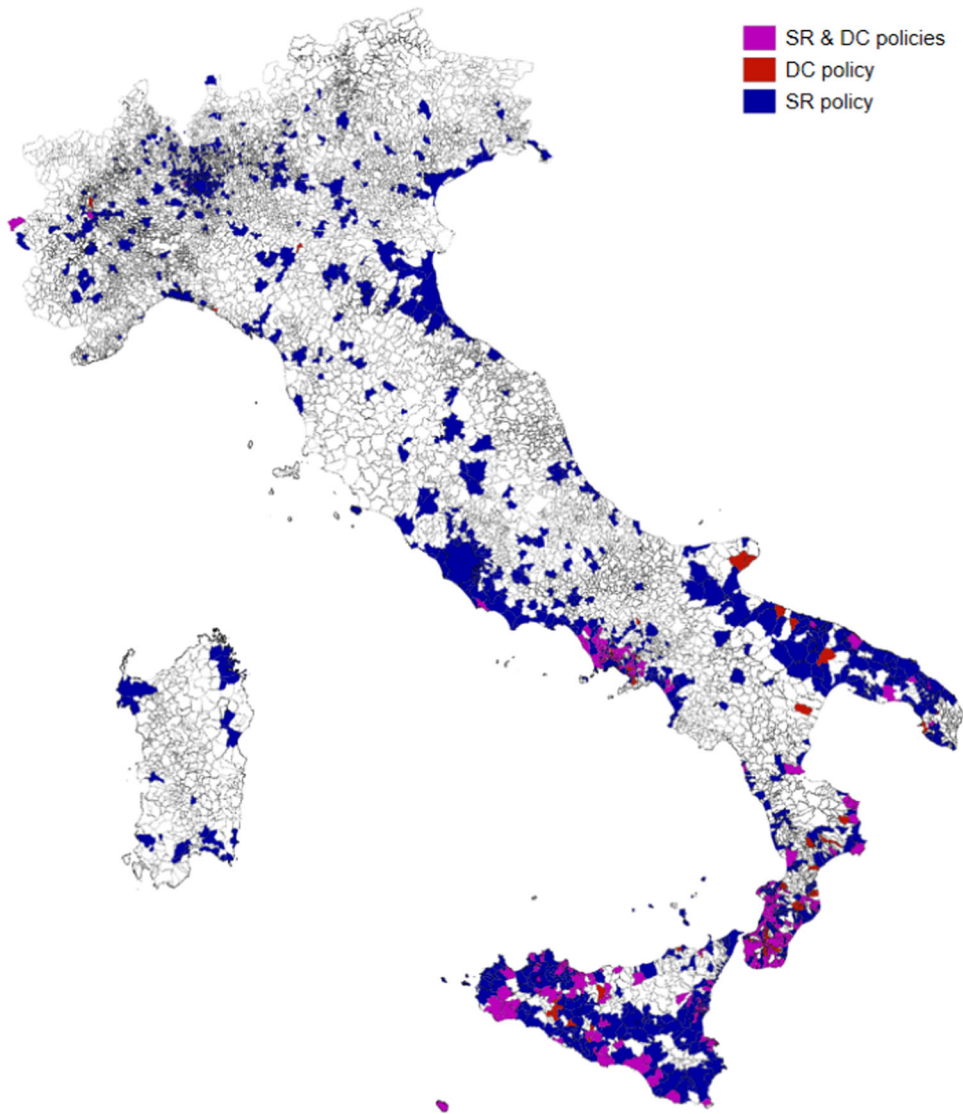


FIGURE 2 Italian municipalities affected by the SR policy and the DC policy. The figure displays the Italian municipalities affected by at least one SR policy (in blue), at least one DC policy (in red), and at least one of both policies (in purple), up to the first semester of 2019. *Source:* Our elaboration on ANBSC and Ministry of Interior data. ANBSC, Agenzia Nazionale per l'amministrazione e la destinazione dei Beni Sequestrati e Confiscati alla criminalità organizzata; DC, dismissal of city councils; SR, reassignment of confiscated assets.

Following Ihlanfeldt and Mayock (2010), the dependent variable in all the specifications is $GRHP$, the growth rate of housing price in the municipality m at time t . Considering the variable in terms of percentage variation addresses and alleviates endogeneity issues inherently related to organized crime presence and property values (Ihlanfeldt & Mayock, 2010).

The variable DC (SR) takes value 1 starting from the semester t when at least one DC (SR) policy has been implemented in the semester before the release of the report on house prices, and 0 otherwise. The coefficient η controls for fixed effects at the municipal level and γ controls for time fixed effects (at the semester level) to

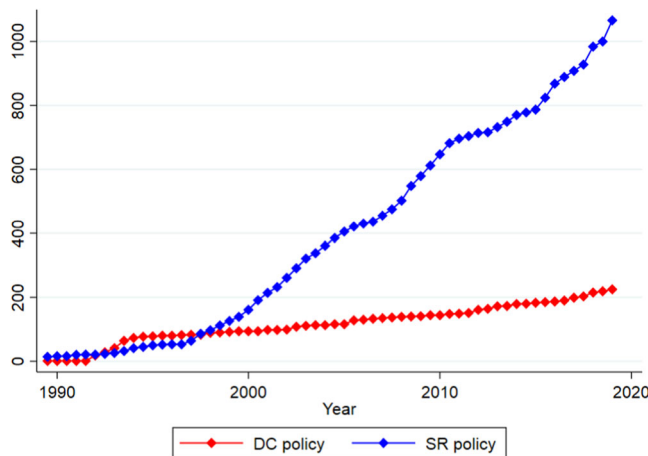


FIGURE 3 Italian municipalities affected by DC and SR policies over time. *Source:* Our elaboration on Ministry of Interior and ANBSC data. ANBSC, Agenzia Nazionale per l'amministrazione e la destinazione dei Beni Sequestrati e Confiscati alla criminalità organizzata; DC, dismissal of city councils; SR, reassignment of confiscated assets.

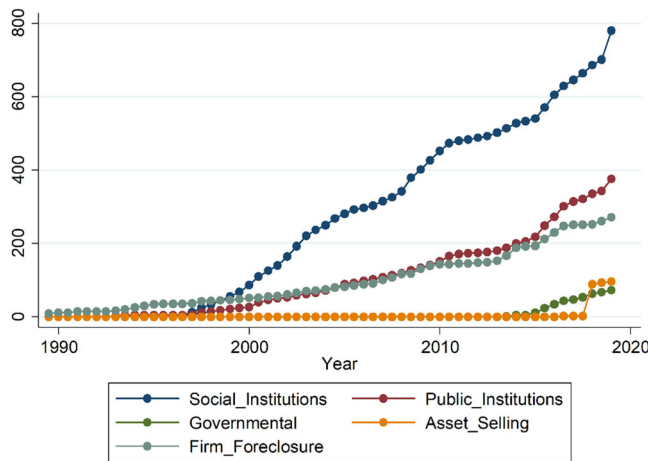


FIGURE 4 Italian municipalities affected by SR policies by reassignment purposes over time. *Source:* Our elaboration on ANBSC data. ANBSC, Agenzia Nazionale per l'amministrazione e la destinazione dei Beni Sequestrati e Confiscati alla criminalità organizzata; SR, reassignment of confiscated assets.

account, respectively, for unobserved heterogeneity across municipalities, and for common dynamics over time. The parameters β and δ define the “treatment effect” on our outcome variables, indicating if and how the dissolution of a council and the reassignment of confiscated assets affect the growth rate of housing prices in the municipality where the antimafia program has been implemented. In a further specification, we decompose the variable SR in a set of dummy variables, according to the reassignment purposes (public institutions, social institutions, governmental uses, asset selling, and firm foreclosure).

The identification strategy behind this estimate is based on two main assumptions. First, the parallel trends assumption requires that in the absence of any treatment, treated and untreated municipalities would have

followed the same trends in the outcome variables over time. Second, the year in which a municipality experienced an antimafia policy is plausibly exogenous to its housing market trend, controlling for the large set of fixed effects (conditional independence assumption). Several facts support this assumption for both policies. As far as the DC policy is concerned, it consists of the dissolution of municipal councils where mafia infiltration episodes have been detected by judicial authorities. The *Commissione Parlamentare Antimafia* conducts a national-level inquiry that is kept secret until it is implemented, therefore eliminating local politicians from the probe. Similarly, behind the SR implementation, a committee of judges reviews the individual case and enacts each final judgment of confiscation independently and every provision of reassignment is examined according to the Antimafia Code. In our analysis, we focus on the reassignment step, which follows the confiscation of the mafia asset and makes the measure final (while the seizure stage may be withdrawn). As evidenced by the Corte dei Conti (2016), the time gap between confiscation and reassignment may vary for each instance due to the substantial heterogeneity in disposition time among and within districts.

From the perspective of the first two assumptions, we perform an event study in the spirit of Angrist and Pischke (2008). The purpose is to test whether a statistically significant difference between municipalities treated receiving antimafia policies and nontreated municipalities arises before the actual implementation of the policy. To this end we estimate a version of Equations (1) and (2), where DC and SR dummies are replaced by a full set of leads and lags, taking the semester before the treatment takes place as our reference category. This specification generates a more flexible functional form that allows for a period-to-period variation in the estimated effect of DC and SR on our outcome. The equations take the following form:

$$GRHP_{m,t+1} = \eta_m + \gamma_t + \sum_{\tau=0}^p \delta_{-\tau} POL_{m,t-\tau} + \sum_{\tau=0}^q \delta_{+\tau} D_{m,t+\tau} + \epsilon_{m,t+1}, \quad (4)$$

where POL indexes the set of dummy variables for each observation period preceding the implementation of the antimafia policy; D indexes the set of dummy variables following the implementation of the policy; p indexes the anticipatory effects and q indexes the postpolicy effects. In our case, we consider 10 periods before the implementation of the antimafia policy and 10 periods after the implementation of the policy (i.e., $p = q = 10$).

5 | RESULTS

Table 1 reports the estimation results. Specification (1) shows that the implementation of DC has no effect on the growth rate of housing prices, whereas in specification (2), SR policies are statistically associated with a higher growth rate of prices (the coefficient is equal to 0.0046 and statistically significant at the 1% level). In specification (3), we evaluate the impact of both policies, and in specification (4) we consider their joint implementation. Again, only the SR policy appears to positively affect housing prices at a statistically significant level of 0.01. The simultaneous enforcement is supposed to have a more decisive effect, but the coefficient of the interaction is not statistically significant.

A possible explanation for this result is that only those policies that affect the economic and financial interests of the mafia can effectively reduce its influence in a territory. After the SR policy, criminal groups appear to be financially vulnerable and, thus, lose legitimacy and authority in the eyes of local communities. This gives empirical support to the strategy “follow the money” (*segui i soldi*), pursued by Judge Falcone in his fight against the mafia. Despite the economic content, the specific case of reassignment policy returning an asset to the local community compensates society for the losses deriving from the organized crime infiltration, thereby reducing the disamenities related to organized crime and increasing local amenity. This generates an increase in the rate of housing prices of about 0.5%.

However, to further evaluate this explanation, in specification (5), we report the result for the relevant subcategories of reassignment purposes. We find that *Public Institutions* (*Social Institutions*) is negatively (positively)

TABLE 1 Estimation results.

Variables	(1)	(2)	(3)	(4)	(5)
DC	−0.0029 (0.0041)		−0.0025 (0.0041)	−0.0023 (0.0053)	−0.0024 (0.0040)
SR		0.0047*** (0.0014)	0.0046*** (0.0014)	0.0046*** (0.0015)	
DR * SR				−0.0002 (0.0043)	
<i>Public_Institutions</i>					−0.0042*** (0.0016)
<i>Social_Institutions</i>					0.0045*** (0.0016)
<i>Governmental</i>					−0.0010 (0.0025)
<i>Asset_Selling</i>					−0.0005 (0.0024)
<i>Firm_Foreclosure</i>					−0.0042 (0.0027)
<i>Purpose N/A</i>					0.0027 (0.0023)
Year dummies	YES	YES	YES	YES	YES
Municipal Fes	YES	YES	YES	YES	YES
R ²	0.1755	0.1759	0.1759	0.1759	0.1763
Observations	26,381	26,381	26,381	26,381	26,381
Number of municipalities	1044	1044	1044	1044	1044

Note: Dependent variable: Growth rate of housing prices (€/m²).

Abbreviations: DC, dismissal of city councils; SR, reassignment of confiscated assets.

***, **, and * denote significance at 1%, 5%, and 10%, respectively. Robust standard errors clustered at municipal level in parentheses. *Public_Institutions* includes public uses, while *Governmental* includes justice and public order purposes.

associated with the dependent variable. The other reallocation types are not statistically significant. As noted in the Introduction, this dichotomous result can be explained by the negative reputation of public institutions in Italy and by the proactive role played by social institutions in urban regeneration.

5.1 | Event study analysis

The results of the event study analysis are graphically reported in Figure 5, panels (a) and (b) for DC and SR. Figure 5 shows that before the implementation of either one of the policies there is very limited variation in the growth rate of house prices. Put differently, there is no significant evidence that a change in the growth rate preceded the actual

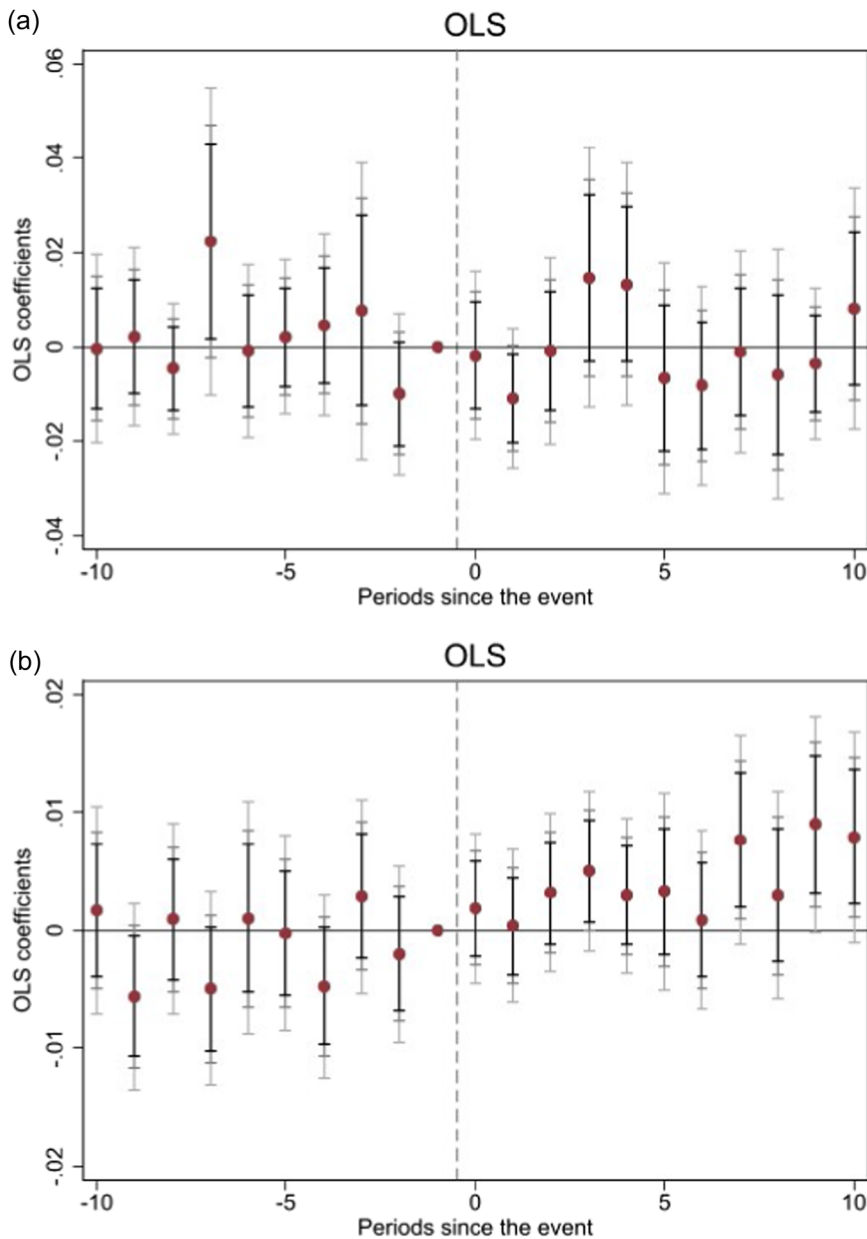


FIGURE 5 Event studies, using TWFE OLS estimation. The panels show the event study results using TWFE OLS estimation. The dependent variable is the growth rate of housing prices, *GRHP*. Coefficient estimates are provided together with the 90% (black), 95% (gray), and 99% (light gray) confidence intervals. (a) Panel A: DC policy and (b) Panel B: SR policy. DC, dismissal of city councils; OLS, ordinary least squares; SR, reassignment of confiscated assets; TWFE, two-way fixed effects.

enforcement of the policy, supporting the evidence of a common trend before the treatment and the absence of an anticipation effect. Rather, if any, a somewhat increasing trend is registered in the periods following the implementation of the policy. This is especially true for the SR policy, where we find a statistically significant effect at the third lag and after 6 lags. Indeed, in line with the main results only the SR policy generates a positive shock

increasing the price of houses, since the reassignment improves local amenities of a city and is a signal of organized crime weakness.

5.2 | A focus on the intensity of the mafia presence

The execution and outcome of antimafia policies may also depend both on the quality of the social context and preexisting intensity of the mafia presence. For example, in areas with high mafia concentration, the outcome may be weak due to the pervasiveness of organized crime in the territory. The reassignment may result in decreased disamenities, or it may go ignored and have no impact on the local amenity stock. Under such circumstances, the negative effect of reallocation to public institutions may be exacerbated, as it can create fertile conditions for further corruption and misconduct in the public sector.

To account for this aspect, we use Calderoni (2011) Index of organized crime intensity to determine if a municipality is mafia-ridden or not. More in detail, we consider a municipality with a relatively high level of mafia intensity if it is located in the 25 most mafia-ridden provinces, according to the index. These provinces tend to be situated in the southern regions of Italy, and account for approximately 55% of the observations. The results, displayed in Table 2, show that in municipalities located in a province with a low mafia presence, the reassignment to social purposes leads to an increase in the growth rate of prices of about 0.5%, as well as for the full sample. In contrast, the reallocations to public institutions do not seem to have any effect. We also report the negative sign of the variable *Public_Institutions* in the subsample with municipalities located in highly mafia-ridden provinces (coefficient equal to -0.0040 , and statistically significant at 0.05). This confirms our intuition on how the reassignment to public purposes is not inherently harmful, except in contexts in which institutions are very weak and corrupt.

6 | POTENTIAL MECHANISMS: DISCUSSION

The findings coming from both the static and dynamic settings reveal that the SR policy is more effective in generating economic value as measured by the growth of housing prices. As for the specific mechanism underlying our empirical evidence, as aforementioned, admittedly a clear-cut explanation is not provided in this analysis. Indeed, due to both the very nature of the mafia and the availability of reliable data, a proper first-stage study on how public policy affects the mafia is currently not feasible. However, we briefly discuss here three main possible mechanisms compatible with our results. More specifically, we further elaborate on our interpretation of the significant impact of the SR policy versus the substantially null effect of DC policy, providing both anecdotal evidence and qualitative analyses backing them.

First, we hypothesize that seizing the mafia's assets is a more effective way to reduce the economic mafia power compared with the alternative DC policy because once the mafia's pressure on territories is (at least partially) released, then the change in the economic environment fosters economic development (Calamunci & Drago, 2020; Calamunci et al., 2022). This, in turn, increases housing pressure (Beer et al., 2007) in territories formerly affected by the mafia presence; hence, the registered positive effect of SR policy on the growth rate of home prices. Specifically, SR policy somewhat returns added value to the community, in the form of social service as compensation for the damage suffered by the community due to the mafia presence.¹¹ Put in the words of the director of the ANBSC, the prefect Corda: "the symbolic value of the confiscation of illicitly accumulated assets,

¹¹Several examples bear witness that the redevelopment of confiscated assets represents an excellent opportunity for economic and social development. For instance, the social cooperative Pio La Torre that manages 180 ha of land, used to cultivate cereals, legumes, grapes, nettles, and olives following the concept of sustainability and taking care of the job placement of disadvantaged people, thus creating employment opportunities. Read here for other good practices: <https://www.fondazioneconilsud.it/news/beni-confiscati-17-nuovi-progetti-al-sud/>.

TABLE 2 Estimation results.

Variables	Low-mafia context		High-mafia context	
	(6)	(7)	(8)	(9)
DC	−0.0046 (0.0081)	−0.0048 (0.0081)	−0.0010 (0.0044)	−0.0011 (0.0043)
SR	0.0052*** (0.0019)		0.0027 (0.0022)	
<i>Public_Institutions</i>		−0.0028 (0.0031)		−0.0040** (0.0019)
<i>Social_Institutions</i>		0.0047** (0.0021)		0.0043** (0.0022)
<i>Governmental</i>		−0.0027 (0.0027)		−0.0005 (0.0035)
<i>Asset_Selling</i>		−0.0018 (0.0031)		0.0015 (0.0034)
<i>Firm_Foreclosure</i>		0.0029 (0.0048)		−0.0048 (0.0031)
<i>Purpose N/A</i>		0.0054* (0.0033)		−0.0008 (0.0030)
Year dummies	YES	YES	YES	YES
Municipal Fes	YES	YES	YES	YES
R ²	0.1690	0.1694	0.1822	0.1829
Observations	11,715	11,715	14,666	14,666
Number of municipalities	471	471	573	573

Note: Dependent variable: Growth rate of housing prices (€/m²). Subsamples of mafia and nonmafia provinces.

Abbreviations: DC, dismissal of city councils; SR, reassignment of confiscated assets.

***, **, and * denote significance at 1%, 5%, and 10%, respectively. Robust standard errors in parentheses. *Public_Institutions* includes public uses, while *Governmental* includes justice and public order purposes. High-mafia context = first 25 Italian provinces according to the mafia-index of Calderoni (2011).

belonging to mafia, is full only when it is effectively returned and reused by citizens who, until recently, in those same assets they read the symbol of criminal power.”¹² The existence of a lagged effect in this regard could be interpreted in the sense that the antimafia policies are to be considered a process, rather than an event. Indeed, while quite often they substantiate into very public events with high visibility echoed by mass media, it might reasonably take some time before people learn that, as a consequence of a cumulative process stimulated by the policy, the mafia has reduced capacity. Moreover, the released pressure of the mafia leaves more room for the development of social capital which, again, requires time to be appreciable and capable of producing significant

¹²Translated from Italian: <https://www.interno.gov.it/it/notizie/anbsc-prefetto-corda-valore-simbolico-dei-beni-confiscati-e-pieno-quando-sono-riconsegnati-e-riutilizzati-dai-cittadini>.

effects. Overall, the evidence seems to confirm that the SR policy would generate such a socioeconomic impulse in the community and territory affected by the plague of the mafia presence.

Second, on a similar premise, one could argue that the reassignment of assets fosters local investments also due to increased social capital (Faguet, 2002; Hansen, 1965).¹³ In fact, seized properties serve as a kind of cultural testament of public ethics in addition to having inherent economic and social content.¹⁴ Their improvement, therefore, might provide the basis for the regeneration of the local areas from an urban, social, and cultural perspective. This regeneration results in positive effects for both local development and house price growth. Admittedly, it is worth noticing here that places that are viewed as having a higher potential for future development are more likely to attract investment from social services compared with places with a substantially lower potential, where likely only government agencies are willing to step in. Hence, it should not be overlooked that the effectiveness of the policy can be influenced by the degree of responsiveness of local communities.

Lastly, one could argue that the observed effects stem from the fact that the presence of the mafia might have a detrimental effect on the territories with mafia-owned places (and/or surrounding estates) making them more prone to degradation and criminal use (e.g., drug dealing and/or consumption). Once the presence of the mafia is at least reduced, the places treated with antimafia policies register (i) a reduction in their degree of degradation and, therefore, (ii) an increase in the growth rate of estates' prices. However, in critically assessing this argument, it is worth noticing that the presence of mafia assets per se does not imply a generalized urban decay. Indeed, on the contrary: "some confiscated assets are then *materially* cultural assets, buildings of artistic value or works of art stolen from organized crime and can become instruments of redemption and education in beauty."¹⁵ Either way, the seizure and reassignment of mafia assets is potentially able to start a process of urban regeneration improving neighborhood amenities, which, in turn, are reflected in growing housing prices.

In conclusion, we deem that the aforementioned mechanisms might well be operating simultaneously and, furthermore, the attempt to disentangle the effect of each and all is a rather complex exercise that we leave for further research.

7 | DIAGNOSTIC TESTS AND ALTERNATIVE ESTIMATOR

In this section, we provide a series of robustness through the estimation of a set of diagnostics tests. Following de Chaisemartin and d'Haultfoeuille (2022a), we first estimate how much of the treatment impact is due to negative weights, and we then decompose our data to evaluate how much of the treatment effect is due to changes at different group-time as Goodman-Bacon (2021). Then, we introduce the new DiD estimation techniques, which were developed by the econometric literature to tackle the econometric issues related to the usual two-way fixed effects (TWFE) as our baseline specification. Finally, we move from a binary DiD approach to a continuous case.

7.1 | Decomposition estimates

Standard panel DiD techniques have lately been called into doubt (among others, Borusyak & Jaravel, 2017; Callaway & Sant'Anna, 2021; de Chaisemartin & d'Haultfoeuille, 2022a; Goodman-Bacon, 2021) because of

¹³During the COVID pandemic, in these places some public initiatives were organized to help local population: <https://www.confiscatibene.it/blog/i-beni-confiscati-riutilizzati-finalit%C3%A0-sociali-palestre-di-vita-tempo-di-pandemia>.

¹⁴There are several cases of good experiences, such as the Parco Ammaturo, Parco della legalità con auditorium, Fattoria Didattica ex Zaza, Ludoteca isola rossa, and so forth. See Transcrime (2013b) for additional information.

¹⁵See Confiscati bene 2.0: <https://www.confiscatibene.it/>.

TABLE 3 Diagnostic Test: de Chaisemartin and d'Haultfoeulle (2022a).

Variable	GRHP	
Mean of dependent variable	0.007	
Standard deviation of dependent variable	0.057	
Variable	DC	SR
% ATTs with negative weights	36.97	35.15
% ATTs with positive weights	63.03	64.85
Sum of negative weights	−0.0026	−0.0027
σ_{fe}	0.0012	0.0023
σ_{fe}	0.0144	0.0046

Note: The dependent variable is the growth rate of housing prices, GRHP. Standard errors (corrected for heteroskedasticity and clustered at the municipality level) are reported in parentheses.

The symbols ***, **, and * indicate, respectively, that coefficients are statistically significant at the 1%, 5%, and 10% levels. Abbreviations: ATT, average treatments effects on treated; DC, dismissal of city councils; SR, reassignment of confiscated assets.

treatment heterogeneity. Thus, our DiD results may be biased since municipalities treated at multiple points in time may generate an average of treatment effects across all municipalities groups and periods, where nonconvex weights can occur. These negative weights bias the results away from the true treatment effect sign (de Chaisemartin & d'Haultfoeulle, 2022a), with certain treatment effects having more weight than others (Goodman-Bacon, 2021). To address these issues, we first estimate the weights attached to each of the average treatments effects on treated (ATTs) to compute the overall β and δ estimates (Equations 1 and 2), using the *twowayfeweights* command, developed by de Chaisemartin et al. (2020) and available in STATA repository.

Table 3 shows the percentage of all ATT estimations with a negative weight as well as the sum of negative weights. Focusing on DC (SR) policy, we find that 63% (65%) are strictly positive and 37% (35%) are strictly negative. Similarly, the sum of the positive weights is equal to 1.0844 (1.4037), while the amount of negative weights is equal to −0.0026 (−0.0027). It is worth considering two diagnostic measures able to further assess the validity of our estimate.¹⁶ The first diagnostic measure, σ_{fe} , suggests that β (δ) and the ATT may be of different signs if the standard deviation of the average treatment effects deriving from DC (SR) policy across treated municipalities and semester is above to 0.0012 and 0.0023, respectively; while the second one, σ_{fe} , indicates that β (δ) may be of an opposite sign than the average treatment effects of DC (SR) policy in each municipality if the standard deviation of those effects is above to 0.0144 and 0.0046.

Second, we decompose our data based on the model developed by Goodman-Bacon (2021). Specifically, we reestimate the DiD models for DC and SR policies, and the two cases of SR policies that are statistically significant in specification (5).

In Table 4 we report the DiD estimates as a weighted average of all possible two-group/two-period DiD estimators, along with the different combinations of units treated at different times.¹⁷ In Figure 6, we plot the time-decomposed DiD estimates against their weights.¹⁸ Rather than relying on single grouping, we detect different sets

¹⁶For details and definitions see Corollary 1 in de Chaisemartin and d'Haultfoeulle (2022a).

¹⁷One limitation of this method is the impossibility to do it for an unbalanced sample. For this reason, we did this exercise using a restricted balanced panel.

¹⁸Generally speaking, the weights depend on the subsample share represented by each group and the time of treatment. For details on the weights and weighting procedure, see Goodman-Bacon (2021, p. 8).

TABLE 4 DiD decomposition for GRHP and selected antimafia policy.

	DC	SR	Public Institutions	Social Institutions
Earlier T versus Later C	-0.010 (0.024)	0.004 (0.229)	-0.004 (0.078)	0.006 (0.165)
Later T versus Earlier C	-0.002 (0.017)	0.002 (0.167)	-0.003 (0.051)	0.005 (0.101)
T versus Never Treated	-0.003 (0.842)	0.003 (0.110)	-0.005 (0.788)	0.003 (0.421)
T versus Already Treated	0.001 (0.116)	0.006 (0.494)	-0.002 (0.083)	0.006 (0.313)
DiD estimate	-0.003	0.004	-0.005	0.004

Note: GRHP denotes the growth rate of housing prices (€/m²). T, treatment; C, comparison. The table reports both the average and the decomposition of DiD estimates using the Goodman-Bacon (2021) procedure (weights in parenthesis). The Diff-in-diff estimate refers to the case in which each policy is individually considered in a simple DiD exercise, that is without the simultaneous effect of other policies.

Abbreviations: DC, dismissal of city councils; DiD, difference-in-differences; SR, reassignment of confiscated assets.

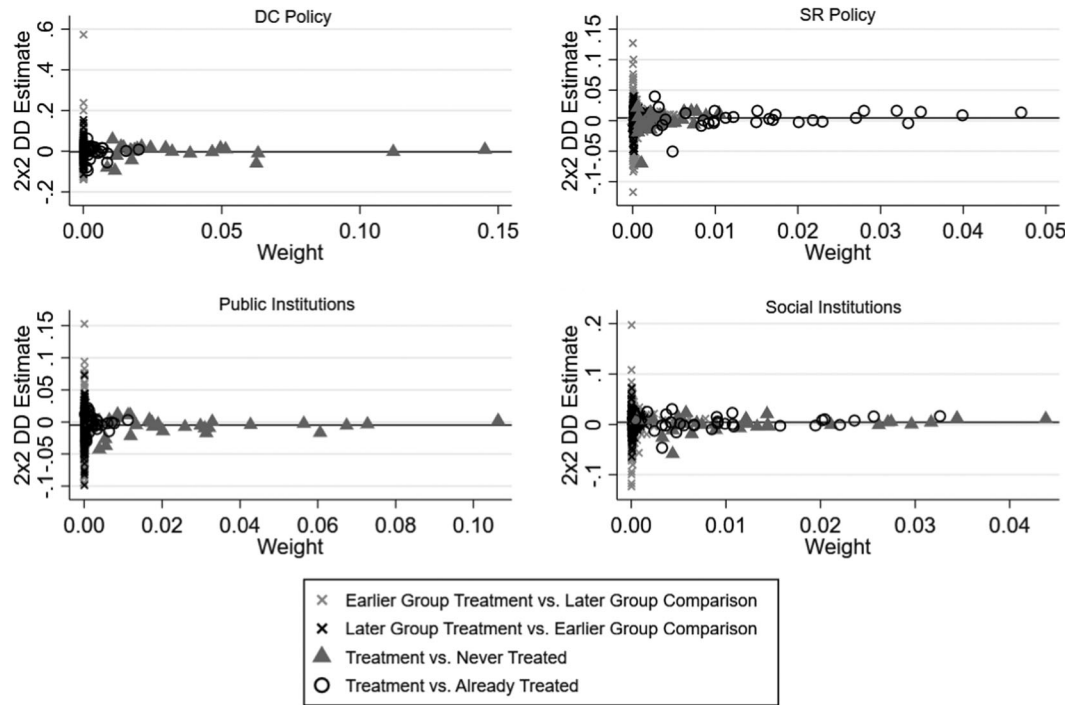


FIGURE 6 DiD decomposition for GRHP and selected antimafia policies. The figure plots each 2 × 2 DiD components following Goodman-Bacon (2021) procedure against their weight. DC, dismissal of city councils; DiD, difference-in-differences; GRHP, growth rate of housing price; SR, reassignment of confiscated assets.

of treatment and control groups. So, we depict the heterogeneity of the several components and show their different contributes to our estimations. As a result, we provide a more nuanced picture in Table 4. The variable *DC* has a generalized negative sign across different groupings except for the *Treated versus Already Treated* grouping. Hence, in municipalities treated with *DC* antimafia policies, we generally observe a lower growth rate of house prices. Put differently, houses located in municipalities where the presence of the mafia has been ascertained and addressed by *DC* policy measures, systematically show a lower price growth trend compared with homogeneous houses in those municipalities not subjected to any intervention. The most significant grouping in terms of weights is the *Treated versus Never Treated* (weight equal to 0.842). A similar pattern applies to *Public Institutions*. However, the variables *SR* and *Social Institutions* follow a different pattern. Indeed, both variables have a positive sign without exceptions. In terms of weights the highest relative importance is registered for the *Treated versus Already Treated* and *Treated versus Never Treated*, for *SR* and *Social Institutions* (weight equal to 0.494 and 0.421, respectively).

Finally, by summing up the weights on the timing comparison versus the treated/untreated weights, this decomposition allows us to determine how much of the variation comes from the time effect. In the case at hand, timing matters most for the variable *SR* (sum of weights equals to 0.890), and to a lesser extent for *DC*, *Public Institutions*, and *Social Institutions* (respectively, 0.157, 0.212, and 0.579).

7.2 | Alternative estimator

The econometric challenges related to the TWFE apply also in the event study context. Indeed, even in a dynamic staggered situation, the coefficient on a specific lead or lag might be tainted by impacts from previous periods (Sun & Abraham, 2021), making difficult also the testing for the parallel trend assumption. Several estimators have been recently proposed to modify the set of units that can be used as effective comparison units in the estimation process (Callaway & Sant'Anna, 2021; de Chaisemartin & d'Haultfoeuille, 2022a; Butts & Gardner, 2021; Sun & Abraham, 2021). However, there is no commonly accepted strategy among the new alternatives, although Baker et al. (2022) advise incorporating at least one among the new ways as the robustness of inference.

Therefore, we employ the alternative estimator established by de Chaisemartin and d'Haultfoeuille (2022a),¹⁹ which is robust to heterogeneous or dynamic treatment effects. This method has two main advantages. First, it does not rely on constant treatment effect assumption across groups and time, and second, it is robust to negative-weighting issues. In this setting, the instantaneous treatment effect is defined as the average of simple DiD estimations that compare groups that have been treated for the first time with those who have not been treated yet from one previous semester to the following one, while the dynamic effect by the weighted average cumulative effects of simple DiD estimations.²⁰ Similarly, the parallel trends assumption is tested through the generation of "placebo estimators" comparing treated municipalities when they are not yet treated compared with untreated ones in the control group in the same period, between two consecutive periods.

Notwithstanding, the main disadvantage of the de Chaisemartin and d'Haultfoeuille estimator is represented by the fact that it requires more data than the standard approach. For example, it requires leads and lags for untreated units to characterize both the dynamic change attributable to the treatment effect and the placebo effect, producing greater standard deviations than the TWFE estimator.²¹

Figure 7, panels (a) and (b), displays the point estimates up to 10 semesters before/after the municipality experiences a *DC* or *SR* policy. Overall, the panels provide strong robustness, validating our empirical design.

¹⁹We use the *did_multiplegt* package available in Stata repository (de Chaisemartin et al., 2019).

²⁰In our context, we compute DiD by comparing the evolution of the outcome over two consecutive semesters across municipalities whose treatment varies between semesters and municipalities whose treatment does not vary.

²¹Chareyron et al. (2020) correctly point out that there exists a variance-bias trade-off. It is because the TWFE decreases variance while improving the inference accuracy, whilst the de Chaisemartin and d'Haultfoeuille estimator mitigates bias owing to heterogeneous treatment effects.

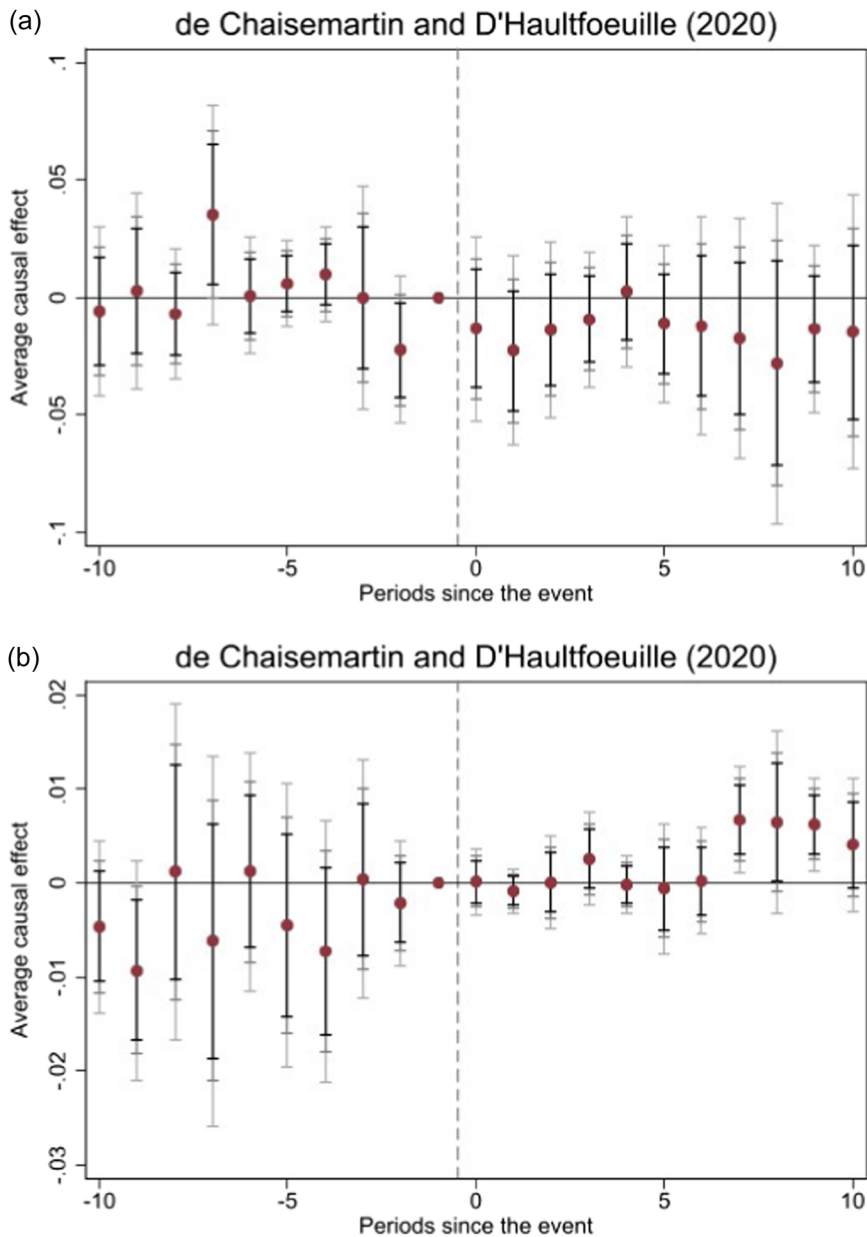


FIGURE 7 Event studies, using de Chaisemartin and d'Haultfoeuille (2022a) methodology. The panels show the event study results, implemented through the estimator developed by de Chaisemartin and d'Haultfoeuille (2022a). The dependent variable is the growth rate of housing prices, *GRHP*. Coefficient estimates are provided together with the 90% (black), 95% (gray), and 99% (light gray) confidence intervals. (a) Panel A: DC policy and (b) Panel B: SR policy. DC, dismissal of city councils; SR, reassignment of confiscated assets.

Indeed, there is no discernible pattern in the pretrend point estimates. In keeping with the primary findings, for the DC policy no dynamic effects are detected, whilst for the SR policy, the dynamic effects begin to rise and become statistically significant after six semesters. Overall, the results are in line with those based on the classic event study.

7.3 | Continuous case

The literature related to DiD strategy and causal inference method, in general, is mostly based on binary treatment variables. However, sometimes the same units of analysis register multiple treatments making the discrete approach too simple. For example, many empirical applications deal with a treatment that does not just “switch on,” but rather has a “dose” response or function at varying intensities (Callaway et al., 2021). Our context is the case: a municipality could be interested by several episodes of reassignment and not just one. Hence, the binary approach is able to capture the effect of just one episode of reassignment in which the treatment switches to 1 and does not change, representing a limitation.

Recently, the stream of literature studying the advancement in the econometric issues related to the standard TWFE approach, among the mentioned methods for the binary (staggered) case, also introduced the possibility of the continuous case. Even in the presence of several treatments, the treatment coefficients may not be robust to heterogeneous effects and be contaminated by the effects of the treatment occurring with different intensities and times.

For this instance, Callaway et al. (2021) de Chaisemartin and d'Haultfoeuille (2022b), and de Chaisemartin and d'Haultfoeuille (2022a), propose alternative DID estimators that are robust to heterogeneous effects and do not suffer from the contamination problem.

The de Chaisemartin and d'Haultfoeuille estimator, in addition to the binary treatment that switches on and off, can be used with a continuous and staggered treatment (groups begin treatment at different dates, with varying intensities, but once a group is treated, its treatment status never changes).

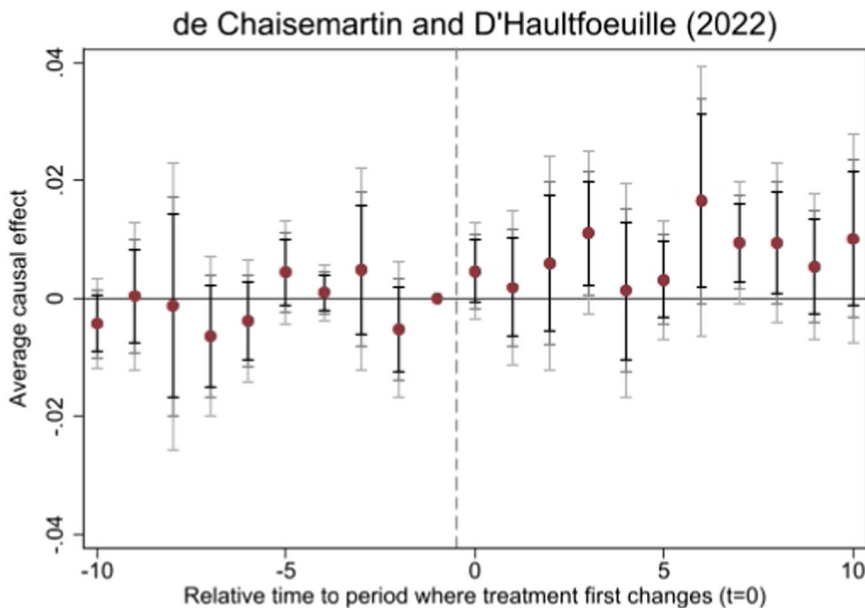


FIGURE 8 Event studies, using de Chaisemartin and d'Haultfoeuille (2022a, 2022b) methodology: continuous case—SR policies. The figure shows the event study results, implemented through the continuous-case methodology developed by de Chaisemartin and d'Haultfoeuille (2022a, 2022b). The dependent variable is the Growth Rate in House Prices, *GRHP*. Coefficient estimates are provided together with the 90% (black), 95% (gray), and 99% (light gray) confidence intervals. SR, reassignment of confiscated assets.

To corroborate the interpretation of our baseline results and overcome the binary setting limitations, following this approach, and using the *did_multiplot* command, we move from the binary context to the continuous one, where the dummy variable SR is replaced by a variable that accounts for the number of reassignments that are registered in each municipality every semester.²² We apply this approach for the SR policy, as in many municipalities the seizure and reassignment measures are enforced more than once in time, and many assets can be reallocated at the same moment.

Figure 8 reports the result. Overall, we provide strong robustness since we have dealt with the treatment structure, the timing problem, and the dynamic effects. To the right of zero, the figure shows the cumulative effect of a reassignment policy on the growth rate of house prices, from the year of the first change onward. We observe a positive dynamic, that starts to be increasing immediately and becomes significant in the third period. To the left, the figure shows the placebo estimators, which should not significantly differ from 0 if the condition of the parallel trend is satisfied. The estimation is weighted by the population in each municipality-group $\times$ year.

8 | CONCLUSIONS

Several legislative measures aiming at eradicating organized crime have been implemented in Italy over the last 30 years. Among them, two antimafia policies stand out: the dismissal of municipal councils for mafia infiltration and the reassignment to a new destination of property confiscated from mafia members. This paper investigates whether the implementation of these policies has had an impact on the growth in real estate prices between 2002 and 2019.

Our results do not detect any significant effect on the dynamics of housing prices due to the implementation of the DC policy. By contrast, we find that the impact of the SR policy on real estate values depends on the specific reallocation purpose. When confiscated assets are reassigned to social institutions, we observe an increase in the growth rate of residential property prices, whereas reallocations to public institutions appears to have an opposite sign, but only where the presence of criminal organizations is stronger.

Although these results call for further investigation at a more granular level, our analysis provides robust empirical evidence that house prices do react to antimafia measures, particularly to the SR policy. In this regard, we argue that its effectiveness depends on how the socioeconomic reintegration of confiscated assets is realized through different potential mechanisms promoting investment, local development, and urban regeneration. Social institutions seem to actively contribute to the desired goal of policy, as reflected by the positive effect on real estate prices triggered by reassignments to social purposes.

Overall, the paper deals with the policy assessment of legislative measures undertaken to address issues related to organized crime that are relevant to the social and economic fabric plagued by its presence not just in Italy, but also around the world. Indeed, legislators in many countries have used comparable legal tools such as asset freeze, seizure, and confiscation UNODC (2017) of criminal property mimicking the Italian model, as well as the spread of an antimafia culture, to protect the legitimate economy from organized crime infiltration.

The battle against criminal organization is central to the international policy agenda, both unilaterally and through international security cooperation. The main policy implications that can be drawn is that central and local governments should be more involved in the activities of civic interest groups and associations, and promote the work of social institutions in local communities. The design of antimafia policies should take full account of the spontaneous reaction of civil society against criminal organizations and people's willingness to engage in collective action. We believe these further efforts are necessary to develop and maintain a culture of lawfulness, engaging in a

²²In our setting, consider a municipality n with a treatment sequence of this type: 0 0 1 0 3 3. It experiences a first event in the third period. From that period onward, it is part of the treatment group. Then, the command estimates the cumulative effects of all its current past treatments. For instance, at period 5, the command estimates its effect of having three reassignments today plus having had one reassignment one period ago. In this way, we are able to assess the cumulative effect of the policy.

successful pathway of urban and territory regeneration.²³ This is even more relevant since other studies (Eriksson et al., 2016; Mihinjac & Saville, 2020), settled in unlawful contexts, highlight the importance of background and neighborhood as drivers that may foster resilience to criminal activity.

The evaluation of antimafia policies might thus offer substantial insights to policymakers. The most effective way to generate public value in areas plagued by mafia-type organizations is through nurturing social capital. Moreover, the empirical analysis detects lagged effects testifying that this creation of social capital must be considered a process rather than an event. We believe this is the ultimate solution to effectively undermine the control exerted by the mafia on local communities and thus contribute to creating a successful pathway for urban and territory regeneration.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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²³For a more thorough study on the role of civil society against the mafia, see Cayli (2013).



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