Another Brick in the Wall? The Educational Effects of Repurposed Mafia Properties

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Abstract

Italy's anti-Mafia legislation allows confiscated Mafia properties to be converted into educational, cultural, and welfare facilities where local NGOs offer various social activities specifically targeting youth and other vulnerable groups. This study provides the first causal estimation of how exposure to these repurposed spaces affects students' dropout rates by changing their attitudes toward educational and criminal pathways. Using school-level geo-referenced data from 2015 to 2022 and exploiting the staggered timing of property reuse, I investigate changes in local dropout rates. Results reveal a significant reduction in dropout rates of approximately 34% relative to the mean for students near repurposed properties. I show that these facilities reshape students' beliefs, reducing the appeal of Mafia networks while increasing the value of formal education. The effects are not explained by gentrification, additional educational support, or civic engagement levels.

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1 Introduction

The detrimental effects of organised crime on education are well-documented, particularly in areas controlled by Mafia-type groups where these effects are highly localised. Juveniles can be directly recruited by Mafia affiliates, and also affected by criminal social norms and behavioural codes (van Dijk, Kleemans and Eichelsheim, 2019; Kleemans and de Poot, 2008). In Italy, Mafia groups have been shown to systematically distort youth's aspirations about investing in education versus pursuing criminal alternatives (Acemoglu, De Feo and De Luca, 2020; Coniglio, Celi and Scagliusi, 2010; Caglayan, Flamini and Jahanshahi, 2017), prompting policymakers to develop targeted interventions for Mafia-affected communities. Among these interventions, the most significant is the Mafia Confiscated and Reallocated Assets Reuse Policy (CRR) implemented nationwide since 1996. Under this policy, seized Mafia properties—former symbols of territorial control and criminal activity—are converted into educational, cultural, and welfare facilities, where local NGOs offer various social activities specifically targeting youth and other vulnerable groups. These repurposed spaces aim to transform former Mafia strongholds into community assets that foster legitimate social bonds and provide alternative role models (Falcone, Giannone and Iandolo, 2016). The question remains, however, whether this symbolic transformation translates into measurable social and economic benefits for the youth. Existing case studies argue about positive community effects (Nazzaro, 2021; Martone, 2020), while established Mafia social bonds may prove resilient to these policy efforts. This empirical gap stems from scarce data on social activities within repurposed facilities and the challenge of establishing causation when property selection may be endogenous to local conditions.

In this paper, I build novel data and exploit the quasi-experimental variation in the presence of reused Mafia properties to provide the first empirical evidence of the effect of repurposing Mafia properties on local education. Moreover, I investigate the mechanisms driving these effects by examining several potential channels. I focus on the ten main urban centres in historically Mafia-ridden regions, which concentrate the majority of confiscated Mafia properties[1]. Local NGOs or municipalities manage these repurposed properties to operate programs focused on education, culture, skills training, and social services, with 45% explicitly targeting the youth. Youth-tailored activities are particularly relevant given that dropout rates in these historically Mafia-affected regions reach concerning levels: 14.6% in Campania and Apulia, and 18.8% in Sicily against a national average of 12.7% (Save The Children, 2022). This setting allows me to exploit the staggered reuse of Mafia properties, conditioning on neighbourhood and municipality-level

[1]The cities I investigate include Naples, Salerno, Bari, Taranto, Foggia, Reggio di Calabria, Palermo, Messina, Catania, and Siracusa. Focusing on the major Mafia-ridden urban centres allows me to leverage the necessary variation in Mafia real estate reallocation and reusing practices

attributes[2].

I create a novel dataset on the number of reused Mafia properties, the nature and duration of social activities by combining information scraped from the website *Confiscatibene*, several internal surveys from the association Libera, which nationally coordinates anti-Mafia CSOs activities, and information published by the municipalities. I leverage administrative data from the National Agency for the Management of Confiscated Mafia Properties to collect the precise locations of the Mafia properties, and I digitise the Antimafia Investigative Directory maps to measure baseline Mafia presence. I collect the locations of all Italian NGOs from the Ministry of Labour database and use educational records from the Ministry of Education covering student enrollment, graduation rates, and students' age for each year. Finally, I employ the Survey of the Perception of the Mafia Phenomenon collected by the Sicilian NGO Centro Studi Pio La Torre to examine student attitudes toward educational and criminal pathways, supplemented by 2011 census data for baseline socio-economic characteristics.
I employ two-way fixed effects (TWFE) models using a DiD design that compares educational outcomes in areas where Mafia properties are repurposed to those located in unaffected areas over the same period. My main outcome variable tracks dropout rates by following the same student cohorts across the last two years of high school. This approach specifically captures students older than 16—the end of compulsory education age in Italy—allowing me to measure dropout decisions when continued schooling becomes voluntary. Given the absence of official high school districts in Italy, I construct school catchment areas loosely following a location-allocation approach based on distances between high schools and census blocks[3]. Catchment areas are defined as treated when they contain at least one repurposed Mafia property, while control areas have no repurposed properties. In this setting, I estimate the average treatment effect on the treated (ATT) and complement my analysis with event study specifications robust to dynamic and heterogeneous treatment effects following Sun and Abraham (2021).

The implementation of social activities in repurposed Mafia properties significantly reduces dropout rates by approximately 34% relative to the mean among students who have reached the age when formal education is no longer compulsory. This effect is proportionally consistent with previous research on the effect of the Mafia on education. Caglayan, Flamini and Jahanshahi (2021) finds that Mafia presence reduces graduation rates by 25% in Northern Italy. I estimate a slightly larger improvement in educational outcomes, which is expected given that we examine historically Mafia-ridden municipalities located in the South, where both the baseline negative effects of the Mafia and the concentration of confiscated properties available for repurposing are substantially greater.

[2]Decisions on which properties should be repurposed are taken by local municipalities and might depend on the availability of local NGOs to run activities
[3]Census blocks defined by the Italian Institute of Statistics typically contain 200-400 inhabitants.

The effects are particularly strong in schools that reported lower baseline scores on a 1–7 self-assessment scale across multiple domains, including both student grade and performance in national standardised assessments, as well as citizenship competences, the quality of the learning environment, and the engagement with families and the broader community. The estimated effects are also particularly pronounced in areas deprived at baseline, measured as areas with lower rental prices.

The heterogeneity analysis at the school tracks level unveils important patterns. Indeed, technical schools emerge as the primary beneficiaries of the properties reuse interventions, exhibiting clear and sustained reductions in dropout rates that become statistically significant between years 2-4 post-treatment and persist throughout the observation period. This contrasts sharply with academic and vocational high schools, which display mixed and statistically insignificant effects. This heterogeneous pattern aligns with the distinct institutional contexts and student populations served by each educational track. Technical schools serve students who often come from backgrounds that value practical skills alongside academic preparation, making them particularly sensitive to the quality of their learning environment and responsive to localised improvements that enhance educational engagement. Unlike vocational students who may naturally exit after three years with their professional certificates to enter the workforce, technical school students are expected to complete the full five-year program, making retention through to graduation more critical and creating greater vulnerability to dropping out before completion. This suggests that the improved community environment from properties reuse plays a crucial role in supporting technical students through their longer educational journey. I test the intensive margin of the treatment, finding that the results are particularly strong in cases where more than 1 property has been reused in the area. When using the count of reused properties rather than the binary treatment indicator and employing the de Chaisemartin and D'Haultfœuille (2024) estimator to account for potential heterogeneous treatment effects, I find that each additional confiscated asset is associated with an 18% decrease relative to the mean[4]. The consistency across binary and continuous treatment specifications reinforces confidence in the robustness of the intensive margin findings. These results remain robust to bootstrapped standard errors with 500 repetitions.

I conduct several robustness and placebo exercises to test the validity of the results. First, I show that the estimated effects are robust to changes in the measurements of catchment areas and are not driven by the mere reallocation of confiscated properties to municipal management before their reuse. Second, it is unlikely that the results simply reflect mean reversion following confiscation, which could have temporarily depressed educational outcomes. The event study specifications reveal no significant differences in pre-trends

[4]Given that treated municipalities have an average of 1.61 confiscated assets, these estimates are remarkably consistent ($18\% \times 1.61 \approx 29\%$), providing strong evidence for a linear dose-response relationship where the intensity of reused activities matters proportionally for the magnitude of effects.

between treated and control schools. Additionally, I rule out that the treatment is endogenous to the presence of NGOs and rental prices up to 3 years before the reuse, finding a zero effect. The main estimates also remain robust to the inclusion of school-level and municipality-level time trends. My analysis of spillover effects reveals that they capture merely residual variation from the main effect. Importantly, the main effect retains its robustness and statistical significance even after accounting for these spillover effects. As sanity checks, I also test the effect of reuse in the following year on current outcomes and the effect of reuse on dropout rates before students turn 16, finding null effects in both cases.

The key mechanism is that reuse activities provide legitimate role models and opportunities, redirecting youth perceptions from criminal influences toward education in previously Mafia-controlled areas. Survey data on student perception reveal that after their area receives treatment, the students increasingly has a negative view of the Mafia; I perform sentiment analysis of how students define the Mafia, finding that their language becomes positively correlated with sentiments of fear and negatively correlated with feelings of joy. Simultaneously, students increasingly perceive education and participation in public competitions as viable pathways to local employment, while viewing Mafia and political connections as less instrumental for career advancement. These findings complement anecdotal evidence gathered through interviews about the potential effects of reuse practices on young people (Nazzaro, 2021; Falcone et al., 2016). Meanwhile, I find that the treatment effect does not vary with the level of neighbourhood rental prices and thus is unlikely to be driven by gentrification processes. The presence of local NGOs does not mitigate the effect, indicating that activities in reused Mafia properties are not easily substitutable by other social and educational programs. Notably, the effect is not driven by properties specifically offering after-school and homework-support activities, but is stronger for properties hosting welfare and cultural activities.

To the best of my knowledge, this is the first paper providing causal estimates on the effects of the reuse of Mafia properties on local education and students' aspirations. Prior research established that the confiscation of Mafia properties increases the prices of commercial real estate located nearby as well as firms' performance, turnover and local market competition (Calamunci, Ferrante and Scebba, 2022; Calamunci and Drago, 2020; Ferrante, Fontana and Reito, 2021a; Operti, 2018). Moreover, the reallocation of such properties increases both market and electoral competition (Ferrante et al., 2021a; Ferrante, Reito, Spagano and Torrisi, 2021b). Those studies have exploited the number of confiscated and reallocated Mafia real estate at the municipality level, leaving the localised effects of the policy unknown. The closest paper to mine is from Boeri, Di Cataldo and Pietrostefani (2023) and examines the neighbourhood-level effects of Mafia properties' confiscation and reallocation on housing prices. Their findings indicate that while

confiscations lead to a decline in nearby housing prices, reallocation drives their increase. I take a step forward from this approach in two key directions. First, I leverage the staggered effect of the reuse of Mafia properties, demonstrating how this process translates policy into action by providing social activities - unlike reallocation, which remains a purely bureaucratic step. Second, I explore the impact of these activities on educational outcomes and the students' perception of the Mafia, an area that has been entirely unexplored until now. For this purpose, the creation of a novel database of the reuse practices of Mafia properties represents an essential contribution. Furthermore, this paper builds on the insights of Nazzaro (2021) and Martone (2020), who offer qualitative case studies on the social effects of reusing Mafia properties in Apulia and Campania, respectively. These studies focus on outcomes related to education and the labour market, enabling me to identify credible mechanisms behind the effects I estimate.

Second, this paper speaks to the literature investigating the impact of urban policies on social outcomes and education; although the evidence seems to be mixed, (Nieuwenhuis and Hooimeijer, 2016) estimated that juveniles' educational and employment outcomes are significantly affected by neighbourhood-specific social programs(Ludwig, Duncan, Gennetian, Katz, Kessler, Kling and Sanbonmatsu, 2013; Alonso, Andrews and Jorda, 2019). This study sheds light on whether the reuse of Mafia properties can help renew the social and human capital at the local level, especially in places where the Mafia have historically infiltrated the social fabric.

Last, this study provides new evidence on how educational and social activities shape juveniles' perceptions of future opportunities, ultimately influencing their choices and life trajectories. Prior work in experimental economics shows that localised, tailor-made programs can play a transformative role not only in improving educational outcomes but also in reducing crime (Heller, Shah, Guryan, Ludwig, Mullainathan and Pollack, 2017; García, Heckman and Ziff, 2019), as well as in strengthening students' interpersonal trust and self-esteem (Kenney and Godson, 2002). Other studies highlight how targeted policies can counteract parental incentives to involve children in illegal markets, thereby reducing pathways into criminality. For instance, Conditional Cash Transfer (CCT) programs increase the opportunity cost of a criminal career and enhance the relative benefits of pursuing education (Sviatschi, 2022a,b). This study advances the literature by focusing on Mafia-ridden areas as a novel setting, showing how educational and social programs can alter juveniles' beliefs about the trade-offs between illicit involvement and educational opportunities.

The remainder of the paper is structured as follows: Section 2 illustrates the relevant institutional background, while Section 3 reviews the conceptual framework that informs the key mechanisms. Section 4 describes the data, while the empirical strategy is developed in Section 5; in Section 6, I present the results articulated in the main results and robustness checks. The mechanisms are detailed in Section 7. Finally, Section 8

summarises the conclusions and introduces the policy implications related to the main findings.

2 Institutional background

In this section, I first introduce the institutional framework of the Mafia Confiscated and Reallocated Assets Reuse Policy (CRR) in Italy; second, I provide an overview of the current practices of reusing Mafia real estate in Italy, their scope their beneficiaries.

2.1 The Mafia Confiscated and Reallocated Assets Reuse Policy (CRR) Policy

Mafia groups have been playing a substantial role in affecting Italy's economy and social development for more than a century. As criminal syndicates, Mafia groups mainly reinforce their power through accumulating both economic resources and social consensus (Sciarrone, 1998). The economic sources of Mafia power were historically neglected [5], until 1982, when Communist Party politician Pio La Torre and Interior Minister Virginio Rognoni drafted a bill to target Mafia assets. In 1976 Pio La Torre, to describe the purpose of their effort, stated that

> The path of simple repression - which strikes at the outgrowth, but does not change the economic, social and political humus in which the mafia has its roots - did not and could not lead to definitive results.

In September 1982, after Pio La Torre was murdered by the Sicilian Mafia, his proposed bill passed and became the main turning point in the Italian fight against the Mafia. The law introduced two key innovations: first, it established the crime of Mafia association under article 416-bis, making Mafia groups directly liable for specific criminal activities[6]; second, since Mafia families' assets serve to reinforce their criminal sovereignty (Operti, 2018; Mosca, 2017), the La Torre-Rognoni law strategically seizes these symbols of power. By targeting criminal assets, the law sends a clear message to local populations: the State is stronger than the Mafia and can confiscate its economic resources.

Yet, the Rognoni-La Torre law did not provide any regulations for the management of Mafia assets, especially real estate, after their confiscation (Menditto, 2013; Nazzaro, 2021). In 1995, after an intense period of mafia killings, several CSOs reacted against Mafia groups by joining a new Italian network to counter the Mafia: *Libera. Associazioni, nomi e numeri contro le mafie. Libera* proposed new legislation—Law 109 of 1996—to allow confiscated real estate to be reused for urban and social recovery, specifically targeting areas most infiltrated by the Mafia (Nazzaro, 2021; Falcone et al., 2016).

[5] Some preventive measures against people connected to Mafia groups have been previously introduced in 1965 through bill n. 575: *Provisions against mafia-type criminal organisations, including foreign ones.* These measures did not target the Mafia's economic assets.

[6] The Rognoni-La Torre bill (n. 646 in 1982) stated that *"Anyone who is part of a mafia-type association consisting of three or more persons shall be punished by imprisonment of three to six years. Those who promote, direct or organise the association are punished with imprisonment of four to nine years."*

This proposal represented a significant shift from repression-oriented anti-Mafia policies toward policies aimed at compensating local communities and providing alternative role models. The NGOs put into practice the beliefs of Sicilian judge Paolo Borsellino, who was murdered by the Sicilian Mafia in 1992:

> The fight against the Mafia must first and foremost be a cultural movement that accustoms everyone to smell the beauty of the fresh scent of freedom, which is opposed to the stench of moral compromise, indifference, contiguity and therefore complicity.

After the introduction of Law 109/1996, a standardised procedure for reusing confiscated Mafia properties was developed to complement the CRR policy. As shown in Figure 1, the Italian CRR policy consists of three main phases: first, Mafia families are arrested and their properties seized upon conviction; second, the ANBSC[7] decides how to repurpose the assets; third, properties are allocated for either institutional purposes (retained by the State or given to local authorities for law enforcement) or social purposes (transferred to local authorities for NGO-run social activities).

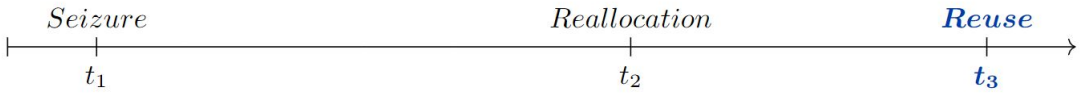


Figure 1 The CRR policy timeline

Figure 2 shows the number of seizures, reallocations and reuse of the main cities from the historical Mafia-ridden regions which compose my sample. Seizures and reallocation increased from the 1990s, while the reusing experiences, which started in the late 1990s, seem to increase dramatically in the late 2010s. My data shows that it takes on average 14 years for Mafia real estate to be effectively reallocated from the time of its seizure and, on average 3 years to be reused from its time of reallocation. Unlikely previous literature, I will not assume that the effect of the reallocation and the reuse of Mafia properties coincide in terms of their timing, contributing to highlighting the importance of the reuse practices.

[7] The National Agency for the Administration and Destination of Properties Seized and Confiscated from Organised Crime (ANBSC) is an executive body which determines how to repurpose confiscated assets, with decisions aimed at compensating local communities (ANBSC, 2019).

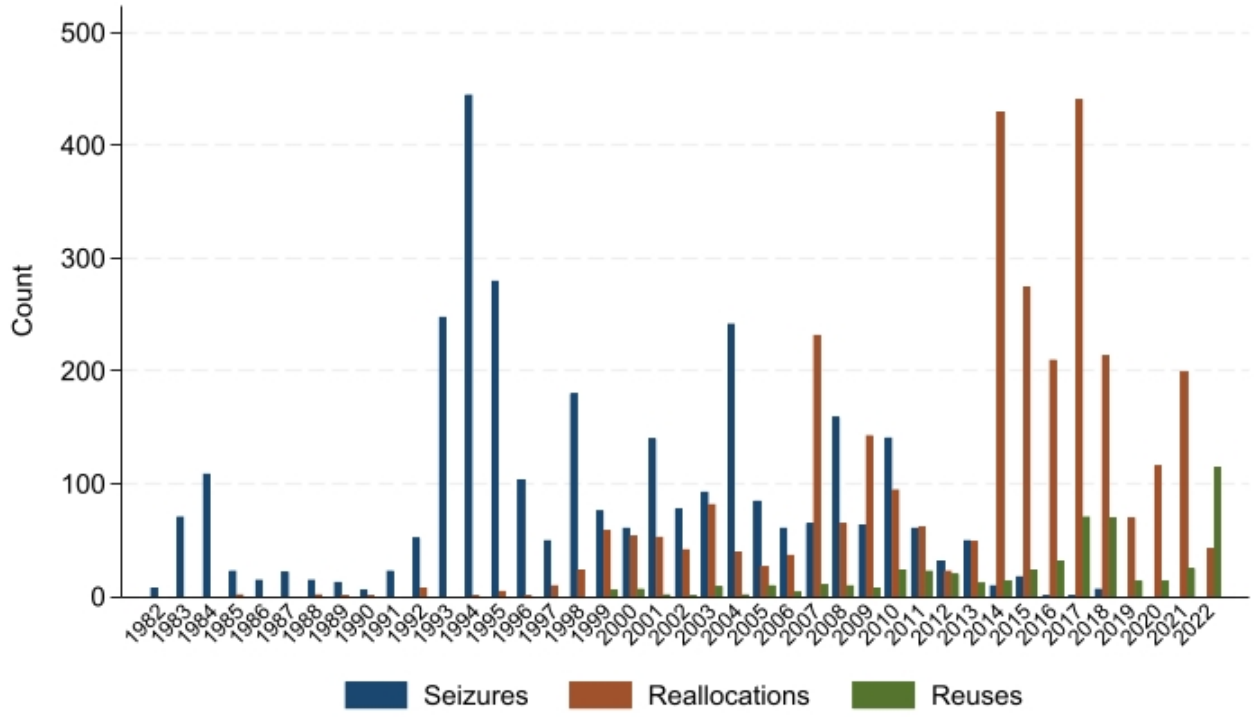


Figure 2 Number of seizures, reallocations and reuses from 1982 to 2022

2.2 The importance of the reuse practice

I focus on the final step of the CRR policy: the effect of actually reusing confiscated Mafia real estate. While existing literature on the CRR policy's socio-economic effects demonstrates that reallocating Mafia properties for social purposes influences various outcomes—including housing prices, market concentration, and electoral competition (Boeri et al., 2023; Ferrante et al., 2021a,b)—a critical gap remains in evaluating the effective reuse of these reallocated properties (Ferrante et al., 2021a). From a conceptual standpoint, the administrative transfer of properties from the ANBSC to local municipalities represents merely a bureaucratic procedure. While this transfer may signal the absence of Mafia control, it does not constitute genuine social renewal or meaningful integration into the community fabric (Falcone et al., 2016).

The distinction between reallocation and reuse is crucial. Once actually reused, the real estate previously owned by the Mafia families transforms into public spaces and community centres managed by local NGOs. These spaces serve as hubs for social activities, youth programs, and community development initiatives, where local residents of all ages participate in recreational and educational activities aimed at reclaiming neighbourhood spaces, rebuilding social bonds, and fostering anti-Mafia resilience (Nazzaro, 2021). The

reuse process involves direct citizen participation that promotes trust, social cohesion, and sustainable local development (Nazzaro, 2021; Falcone et al., 2016). These properties carry distinctive educational significance: they function as youth centres that provide safe spaces for young people during after-school hours and weekends, with participants often sharing their positive experiences in schools and throughout the wider community (Nazzaro, 2021). The transformative power of the actual reuse is perhaps most strikingly demonstrated by Mafia families' reactions, as they frequently attempt to occupy or vandalise their former properties, revealing their deep concerns about the potential for these spaces to be successfully repurposed for community benefit (Ministry of Justice, 2018).

3 Conceptual framework

In this section, I justify why and how the repurpose of Mafia confiscated properties can, in practice, renew the existing juveniles' educational incentives, especially in Mafia-ridden neighbourhoods. I draw on the opportunity cost framework from crime and education literature, then review evidence on how Mafia organizations exploit properties to influence juvenile recruitment, creating alternative authority structures. Second, I examine qualitative evidence from the NGOs operating in repurposed Mafia properties on how their activities influence juveniles' incentives and aspirations. This section wants to motivate the economic mechanisms behind the estimated treatment effects rather than presenting formal model predictions.

Building on the crime choices literature which extend the work from Becker (1968) on education-crime trade-offs (Lochner, 2004, 2011; Lochner and Moretti, 2004; Machin and Meghir, 2004), I discuss how individuals weigh investing in education against joining Mafia networks. This trade-off depends on the legitimate pathways available when individuals face such choice relative to the perceived benefits and social status offered by Mafia affiliation. I argue that the repurpose of Mafia properties creates a local shock to perception of the Mafia, altering the opportunity cost of this trade-off in favor of education.

On one side, individuals face a choice between education and Mafia activities, with Mafia affiliation involving both legal risks such as probability of arrest and unobserved factors such as risk preferences. Crucially, Mafia groups offer not only monetary returns but also non-monetary benefits—local power, reputation, and social status—which are essential for maintaining their territorial control (Gambetta, 1996; Sciarrone, 1998). Individuals choose to join Mafia activities when the total expected benefits exceed the expected costs.

On the other, young people living in in Mafia-dominated areas often view organized crime as a viable path to success, with powerful bosses serving as alternative role models

(Caglayan et al., 2017). The absence of legitimate opportunities reinforces this appeal, making Mafia affiliation appear as the primary avenue for career advancement (Catozzella, 2011; Balestrini, 2004).

Anti-Mafia policies can alter the cost-benefit calculation of joining the Mafia. Since Mafia strength relies heavily on social consensus, civil society interventions can effectively counter their power (Arlacchi and Chiesa, 1987). The activities to repurpose Mafia properties directly target their function as *positional goods*—luxury symbols demonstrating territorial control and legitimacy (Hirsch, 1976; Baldascino and Mosca, 2012). These properties serve as visible manifestations of power, helping Mafia families maintain their role model status in local communities (Mosca, 2017). In this context, the reuse of Mafia properties for social use alters the aforementioned pay-off. While it doesn't affect monetary gains, which are mostly affected by their confiscation, it directly undermines the Mafia's non-monetary benefits by transforming symbols of their dominance into community social amenities. This weakens the Mafia's social control and reduces the appeal of joining their networks.

What are the mechanisms through which property repurposing weakens the social control of Mafia networks? The mechanism operates through the activities offered by the NGOs that manage repurposed properties, which provide alternative socialisation pathways and legitimate opportunities for at-risk youth. By offering education, social, and cultural services, these organisations transform former symbols of Mafia power into sources of community social capital (Chiodo, 2021; Mosca, 2017; Baldascino and Mosca, 2012).

4 Data

4.1 Schools data

I use school-level data covering the public upper secondary schools[8] in the major urban areas of the historically Mafia-ridden regions in Italy. School-level data were provided by the Italian Ministry of Education, allowing me to geocode each specific school's location to cover the period between 2015 and 2022. The data provide information about the number of students enrolling and the number of students graduating in each academic year as well as their age. Additionally, the data provide information about the school-specific educational track: *Licei* are high schools focusing on academic subjects and mainly preparing students to enrol in university, *Istituti Tecnici* provide a more practical and technical education, while *Istituti Professionali* offer vocational training. From each track, we know students can specialise in different subjects; the specialisations offered to date count to

[8] According to the Italian education system, upper secondary schools correspond to grades from 9 to 13, serving students aged 14-19. These include academic high schools, technical institutes, and vocational schools, as described in Table 1.

14 and are summarised in Table 1, as outlined by the Italian Ministry of Education[9]. To provide clarity to the analysis, I first removed from my sample schools that changed address across the sample, unless they kept their location within the same specific census block. Second, to reduce the occurrence of measurement error, I double-checked that schools that merged at some point in the panel were located at the same address. Last, I decided to exclude from my sample private high schools, which in the Italian context target a specific subgroup of the population and only represent 5% of the entire country's enrollment preferences (ISTAT, 2021[10]).

Table 1 The types of high school tracks

HS Tracks	Description	Specialisations	Sample %
Licei	Provide students with the skills and knowledge for higher education in classical studies, scientific studies, linguistic studies, humanities, music, and fine arts.	6	0.411
Istituti Tecnici	Provide practical and technical skills related to key sectors such as administration, marketing, and industrial development.	2	0.371
Istituti Professionali	Provide vocational skills for industrial, commercial, and social development, as well as agricultural, maritime and hospitality skills.	6	0.101

In the Italian educational system, upper secondary schools offer a five-year educational program. Students typically enrol at age 14 and graduate no earlier than the calendar year when they turn 19. Compulsory education lasts 10 years, from ages 6 to 16, creating a critical threshold in school attendance. This legal framework leads to specific dropout patterns, which typically worsen in the transition between the 3rd and 4th year of the upper secondary cycle. Before the age of 16, students have limited discretion over school attendance, making dropouts relatively rare. However, once students turn 16, they gain legal freedom to discontinue their studies, leading to a marked increase in dropout rates. Empirical evidence illustrates this pattern: in 2015, the average rate of students dropping out from high schools before turning 16 was only 3.3%, while the rate of students who dropped out after turning 16 was 8.2%. Similar patterns persist over time—in 2022, just 2% of the students dropped out before turning 16, compared to 5.41% who dropped out after reaching this age threshold (ISTAT, 2023). This paper focuses on the dropout behaviour after the age of 16 —specifically, following completion of the third year of upper secondary school— when students gain legal autonomy to discontinue their education. Educational decisions at this juncture are particularly sensitive to contextual influences, as students weigh the costs and benefits of continued schooling against

[9]The organisation of Italian high schools is published by of Education (2024)

[10]Information about the share of students enrolling in private high schools can be found as a part of the ISTAT database (ISTAT, 2021)

immediate alternatives (Angrist and Krueger, 1991). This is precisely when local environmental factors exert their strongest influence on educational persistence (Oreopoulos, 2007). The symbolic transformation of Mafia real estate into educational or community resources is most likely to affect students' attitudes toward civic institutions during this critical decision-making period, allowing me to isolate the effects of reusing practices from earlier compulsory schooling constraints.

Given the localised nature of the treatment effect, it is necessary to identify which students attend which school by linking their residential origin and the location of their school. To address this issue, I would need to employ student-level educational data, which are not easily released to the public. To systematically assign students to schools in the absence of formally defined school districts — a common challenge in the use of educational data — I build school catchment areas using a revised distance-based location-allocation method. My approach follows established practices in the spatial analysis literature for defining catchment areas when administrative boundaries are unavailable (Pearce, 2000; Singleton, 2011). The main methods would employ the use of weighted-Voronoi polygons to address this issue from a geometric perspective, or the location-allocation method, which accounts for the distance between the school and the census block, the school's capacity and the size of the students' population within a distance of 15km. Pearce (2000) shows that while the former offers theoretical elegance and computational simplicity, the latter is better in predicting the dimensions of schools' catchment areas in real-world applications.

Figure 1 illustrates the way I compute schools' catchment areas. I consider the Euclidean distance between each school and each census block, which seems to be a primary factor influencing enrollment preferences (Mandic, Sandretto, García Bengoechea, Hopkins, Moore, Rodda and Wilson, 2017). The identified census blocks which I aggregate into schools' catchment areas come from the 2011 Italian census data (ISTAT, 2011). Second, I differentiated catchment areas by educational track, acknowledging that families' and students' school choices also depend on the type of track offered. I ultimately created catchment areas for 14 distinct specialisations that map onto the three main tracks described in Table 1. Rather than imposing arbitrary distance constraints, the track-specific assignment approach naturally determines appropriate catchment boundaries by ensuring each census area accesses its nearest school within each educational program specialisation. This method avoids the problem of unassigned areas while recognising that students' spatial choice sets are defined by program availability rather than arbitrary distance thresholds.

Original census blocks are in total 10556 have an average area of 0.05km2, an average population of 200, with a 11.64% of residents aged 14 to 19. I compute 334 schools' catchment areas aggregating on average 580 census blocks[11]. Each area has an average

[11]The schools' catchtment areas are computed for each school track, hence the total number of census

population of 104370, with 5.7% aged 14 to 19.

As a robustness check, I construct a second set of schools' catchment areas under a stricter capacity-weighted assignment, to test whether the results are robust to changes in measurement assumptions. When the student population mismatches the school capacity, census blocks are reallocated to nearby schools offering the same track. Appendix A explains the details of this process, while Section 6 shows that my results hold.

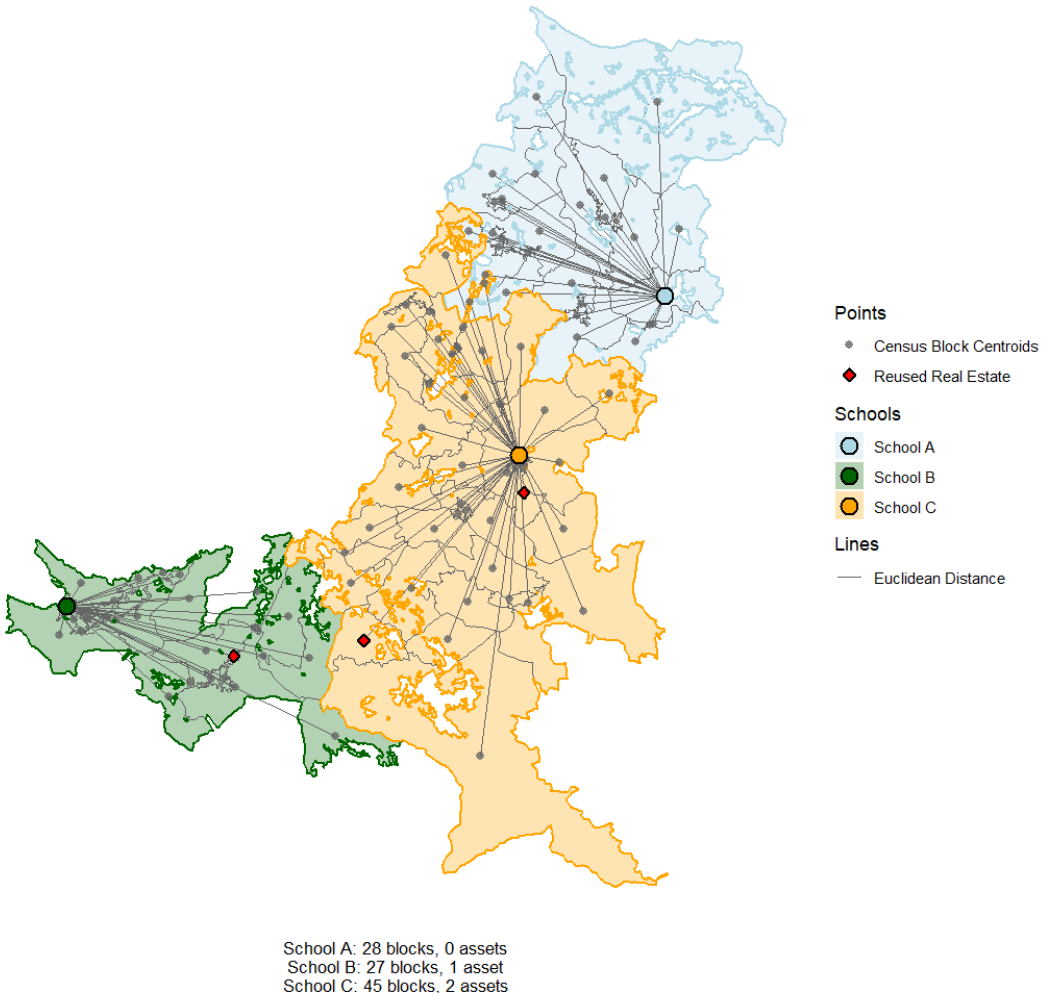


Figure 3 Ad-hoc example of schools' catchment areas construction

The main outcome variable is the cumulative dropout rate, which is a result of following the same cohort of students over time. I focus on the transition between the third and fourth years of upper secondary school because this period corresponds to when students, on average and if progressing normally through the system, turn 16 years old - the legal minimum age at which they can drop out in Italy. Specifically, I track students who were enrolled in the final three years of upper secondary school (3rd, 4th, or 5th year)

blocks from the raw data does not align with the average number of census blocks in each catchment area

in year t-1 and measure how many of these same students remain enrolled in the upper years (4th-5th) in year t. The dropout measurement is built as follows: I first consider all students from specific cohorts who were enrolled in any of the final three years (3rd, 4th, or 5th year) at time t-1. From this baseline, I subtract those who graduated — meaning they successfully completed their five-year upper secondary education —and calculate the remainder as a share of the initial enrollment. This gives me the proportion of the same cohort who successfully continue in the upper years (4th-5th) at time t. Since enrollment data is collected at the end of each academic year, this method ensures I'm tracking the same group of students across time periods, rather than comparing different cohorts. The cumulative dropout measure is defined as follows:

$$Dropout3rd-5th_t = \frac{Enrol_{3rd-5th,t-1} - Graduated_{t-1} - Enrol_{4th-5th,t}}{Enrol_{3rd-5th,t-1}} \quad (1)$$

where $Dropout_{16+,t}$ represents the cumulative dropout rate for students aged 16 and above in year t, $Enrol_{3rd-5th,t-1}$ represents the number of students enrolled in grades 3-5 in year t-1, $Graduated$ is the number of students from this cohort who successfully graduated in year t-1, and $Enrol_{4th-5th,t}$ represents the number of students from the initial cohort who remain enrolled in grades 4-5 in year t.

This cohort-tracking approach ensures that dropout rates reflect genuine dropout patterns from the same group of students rather than demographic changes between different student cohorts. By isolating graduation as a separate category, the measure provides an accurate assessment of educational dropout that distinguishes between students who leave due to completion versus those who drop out before finishing their studies. Moreover, to address the concern of students' migration and internal retention across the last three years, I show that my results are robust when I control for these factors.

4.2 Mafia real estate data

I create a novel dataset of reused confiscated Mafia properties by webscraping several institutional sources and by collaborating with the Italian antimafia Association *Libera*. I start the dataset construction from the list of reallocated Mafia property released online from the ANBSC (2023). The data comprise a unique identifier for each Mafia real estate, the type of real estate, its usage before confiscation, the recipient of the reallocation, the purpose of the reallocation, and the date of first confiscation and reallocation. From a total count of 3667 real estate properties, I was able to geocode 3119 real estate[12], with 42% and

[12]The majority of the real estate which I failed to geocode due to incomplete information comprise lands in rural areas, which will less likely affect the dropout of urban areas.

41% of them reallocated for social and institutional purposes, respectively[13]. Crucially for this analysis, 66% of the real estate has been reallocated under the jurisdiction of the nearest municipality, as only these properties can undergo the complete transformation process from confiscated asset to community resource that forms the core of my research. Finally, 83% of real estate represent housing estate - such as villas and flats - while 10% are represented by commercial and industrial estate, and 12% are lands.

Second, I scraped information from thr website *confiscatibene*, which is managed by the Association Libera in collaboration with the ANBSC. On this platform, the Association and the users update the current state of the properties, flagging whether they have been reused for any social activity. Information are provided about the description of the activities, and the name of the local NGO managing the real estate. In a few cases, the website also reports the year and the month when the reusing experience started. Since the website release the updated information up to 2018, I collaborated with the Libera national managers of confiscated Mafia assets which allowed me access to their yearly survey targeting NGOs managing reused Mafia properties, giving me additional information about the reuse practices to date. Finally, to minimise missing information, I crossed this information with what single municipalities share on their websites about the current status of Mafia real estate under their jurisdiction. [14].

Figure 5 shows the spatial distribution of Mafia real estate in the ten main cities of historical Mafia-ridden regions. Between 2015 and 2022, 397 of the 3199 Mafia properties have been reused for social purposes by the municipalities and local NGOs, with the majority of them being reused in the major urban centres such as Palermo and Naples. More detailed information on how the reuse of Mafia real estate correlates to other demographic and social attributes are available in Appendix B.

I employ the precise address of each reused Mafia real estate, and I compute two main treatment measures: first, to investigate the extensive margin, I create a dummy variable which defines a treated catchment area whenever at least one Mafia property has been reused within its boundaries. Areas which have been treated before the beginning of the panel are coded as always treated. Second, I compute an intensive margin measure as the count of real estate reused for each catchment area; to account for differences in the number of real estate reused at the baseline, I include time trends of the number of real estate reused the year before my panel starts. Moreover, I test the effects of the dynamic DiD model weighting for the local student population and for the average distance

[13] Only properties reallocated for social purposes are eligibile to get repurposed, hence my analysis will focus on this part of the sample

[14] According to the Art. 48 of the Antimafia Code, municipalities need to address trasparency regarding the management of Mafia real estate under their jurisdiction and they are expected to share online an updated list of the real estate and their current state every month. The Association Libera organised monitoring activities and redacted reports since 2016 to evaluate municipalities' transparency and the actual presence of reusing practices.

of reused properties from population-weighted centroids[15]. The resulting measure provides a continuous treatment intensity variable that varies both spatially and temporally; moreover, long-term exposure to reused real estate may have compounding impacts, and the weighted specifications reflect both the localised nature of reusing practices and their expected decay with distance from treatment sites (Damm Dustmann, 2014; Boeri et al., 2023).

To identify and analyse the types of social activities organised at these sites, I manually categorised each activity drawing on the main keyworkds in the data and the categorisations used in previous Libera reports (Falcone et al., 2016). I identified five main types of activities: educational, welfare, cultural, employment-related, and other. Figure 1 shows the wordcloud of the 100 most frequent words in the description of the activities, while Table 1 presents the number of confiscated Mafia real estate assets reused for each activity type, along with a detailed description of the categories.

This research provides the first comprehensive database on the current status of Mafia properties reused for social purposes. The data collection represents a novel contribution to the literature, addressing previously fragmented and unaggregated sources that have never been systematically compiled and employed for empirical analysis.

Figure 4 Wordcloud of the descriptions of activities in reused Mafia properties

[15]Population-weighted centroids are calculated by taking the weighted average of the coordinates of all census block centroids within each catchment, where the weights are the high school-age population (ages 14-19) in each block, resulting in a single centroid per catchment that reflects the spatial distribution of this specific student population

Table 2 The types of reusing activities

Activity	Description	Reused Mafia real estate %
Welfare	Places for housing emergency, activities to assist the homeless and people in need, social activities targeting vulnerable groups	0.483
Education	After-school activities and schooling support, socio-educational activities for at-risk juveniles	0.235
Culture	Cultural activities to raise awareness about organised crime, the rule of law and self-responsibility	0.126
Employment	Support and training activities for unemployed people or fragile groups	0.083
Other	Activities in the agricultural industries aiming to sell organic products and other	0.074

4.3 Survey on youth's perception of the Mafia

I employ survey data from the *Survey of the Perception of the Mafia* to investigate changes in the perception of the Mafia and its role in shaping youth's aspirations for the future. The survey data are created and provided by the Sicilian NGO Centro Studi Pio La Torre, targeting students enrolled from the third to the last year of high school, roughly from 16 to 19 years old. Some responses are aggregated at the school level, which I can identify with a unique code, while others provide a unique identifier per respondent. The survey, which spans from 2009 to 2024, is administered to students through a collaboration between the schools and the NGO. While this creates a selected sample, it allows me to directly test whether changes in mafia perception serve as a mediating channel for the treatment effect. For this purpose, I focus on the answers collected from 2011 to 2022, a time frame for which consistent questions can be examined.

The students' questionnaire comprises a battery of questions on several key dimensions of Mafia perception: students' perception of the relationship between the State and the Mafia (V32), and their beliefs about whether the Mafia could be useful or not for career advancement (V28); moreover, student-level definitions of the Mafia are offered (V12). Appendix A offers a complete list of the answers I employ. Considering the school-level answers, I create dummy variables for each specific option of the multiple-choice questions the students have been asked to answer. Regarding the student-level answers, I calculate sentiment scores for the words used by the students to describe the Mafia. I use these indicators to assess whether the reuse of Mafia real estate leads students to change their

perception and sentiments towards the Mafia.

4.4 Other data

I decided to collect information about the socio-economic conditions of the local community around the schools; this would help me understand the local characteristics of the places where Mafia real estate get reused, which can potentially affect educational outcomes through several different channels.

I first collected information about rental prices from 2016 to 2022 from Immobiliare.it as a proxy for the local level of deprivation; second, I scraped from the website of the Italian Ministry of Labour and Social Policies (MLPS) information about local NGOs, such as their legal address, the time the NGO was created, the type of activity they pursue and the number of people which engage in their activities. As with the Mafia properties, I then geocoded the NGOs' addresses to be able to map them at the street level. Moreover, I digitalised on GIS the historical maps about the street-level distribution of Mafia families in Italy from the Italian Antimafia Directorate (DIA) from 2014. Lastly, I use educational data and students' age to construct proxies for student migration and retention rates at the school catchment level. I define student migration as the average number of students who do not re-enroll in the following academic year during the first three years of high school (typically aged 13 to 15). Appendix A describes how the student migration variable has been built in more detail. I define the student retention rate as the proportion of students enrolled in years 3 to 5 who are older than the expected age for their grade level, indicating grade repetition or delayed progression.

Table 3 shows the differences between the treated and control schools' catchment areas. The selected variables aim to provide insights on the characteristics of the local communities of the selected municipalities.

Areas where the reuse of Mafia properties occurs show systematically higher historical Mafia presence, with a slightly lower level of rental prices compared to areas without reused properties. Additionally, there is a significantly higher presence of civic engagement, as indicated by the larger number of NGOs operating in these regions. When examining student dynamics, treated areas exhibit virtually the same patterns.

Table 3 Descriptive statistics

	Reused Mafia properties in the school area			
	No		Yes	
Baseline covariates	N	Mean	N	Mean
Mafia presence	573	0.644	1,234	0.703
Rental prices	568	7.460	1,207	7.261
NGOs presence	561	37.43	1,207	45.45
Grade retention 3rd year	559	0.0248	1,185	0.0247
Grade retention 4th year	559	0.0156	1,185	0.0133
Students migration	556	0.355	1,190	0.352

Notes: Descriptive statistics of baseline covariates by treatment indicator

5 Empirical strategy

The process that delivers the reuse of Mafia properties involves many actors, making it challenging to estimate the effect of reuse practices on dropout dynamics. Properties selected to be reused are located in more deprived areas with a higher level of civil engagement and baseline Mafia presence. In addition, the baseline budget of municipalities to improve education and living conditions might correlate with the probability that Mafia properties will be reused. Since these features are not orthogonal to educational outcomes, a regression strategy would lead to biased results. To address this concern, I identify the systematic determinants of reuse decisions and demonstrate that, conditional on these factors, the variation in reuse timing and implementation is plausibly uncorrelated with other determinants of dropout dynamics [16].

As discussed in Section 2, when a Mafia property gets reused for social purposes, becoming a community, after-school, or social services centre, the real estate evolves from a symbol of Mafia power to a symbol of community resistance (Mosca, 2017). These places may not only improve neighbourhood support and educational services, but also reshape the perception of the local population about the Mafia as an alternative career provider. In this context, students at a critical age to drop out of school might rationally choose between pursuing education and joining the Mafia based on the expected returns from each option, as discussed in Section 3. The potential effect of the reusing practices is then twofold: the reused Mafia properties may reduce dropout rates by increasing returns

[16] It is still possible that reused mafia properties differ based on unobserved factors from those that remain unused - such as specific acts of resistance or vandalism, or unobserved municipal political dynamics - which could bias the estimated effects in either direction. If reused properties are systematically located in areas with greater unobserved criminal resistance, political instability, or social tensions that make reuse more contentious, this could lead to underestimation of the true effect by creating additional challenges for educational improvement that are not captured in the analysis; if reused properties are located in areas with stronger unobserved community mobilization or political commitment to anti-Mafia efforts, this would lead to overestimation of the treatment effect.

to education through improved neighbourhood and educational services, or by reducing the perceived attractiveness of criminal careers as symbols of Mafia power transform into symbols of State authority and community resilience.

My empirical strategy is structured as follows: first, I investigate what are the determinants of the reuse of Mafia properties as discussed in Appendix B[17]. This exercise guides me in understanding baseline differences in the probability of being treated. Then, I estimate a difference-in-differences (DiD) model comparing school catchment areas exposed to reusing practices to those that are not. I also estimate the dynamic version of the model to investigate the intensive margin of the treatment.

5.1 DiD model

I estimate a TWFE model under a DiD design with staggered treatment adoption. The first model estimates the extensive margin of the treatment comparing treated and control schools before and after the treatment assignment. I define *treated* schools catchment areas which present at least one reused Mafia property within their boundaries, and *control* those who do not. The sample comprises a total of 1487 observations with 293 unique school catchment areas for which the dropout information is not missing[18]; of those, 52 were never treated, while 282 have been treated at some point in the sample. The first model is specified as:

$$Dropout3rd-5th_{cnmt} = \beta_1 Reuse_{ct} + \beta_2 X_{ct}^{'} + \delta_c + \eta_t + \epsilon_{cnmt} \tag{2}$$

where $Dropout3rd-5th_{cnmt}$ is the share of students dropping out after turning 16 in schools catchment area c, measured in year t; $Reuse_{ct}$ is equal to 1 if there is at least one Mafia property within the school catchment area in year t + n after the reuse. Since the treated schools are treated at different points in time, the coefficient of interest β_1 captures the average treatment effect on treated (ATT) comparing treated school catchment areas to never or not yet treated ones. X_{ct} is a vector of controls at the catchment area level including migration dynamics among students and grade retention rates for the 3rd and the 4th year of high school. Additionally, δ_c captures the catchment areas fixed effects, and

[17]Moreover, in Appendix C, I report an additional exercise showing that my main results are robust to the introduction of time trends capturing those determinants

[18]The dropout measure has several missing values for the years 2015 and 2016. The measure tracks students from the same enrollment cohorts over their 3rd to 5th years of study. Dropout rates cannot be computed for 2015 cohorts (data for 2014 are not available) and some 2016 cohorts (due to missing data in 2015 preventing complete cohort tracking). Despite this truncated panel, the staggered policy implementation provides sufficient treatment variation for identification.

η_t captures the year fixed effects. Standard errors are clustered at the school catchment area level to account for spatial autocorrelation.

As shown in Table 3, treated areas exhibit higher levels of Mafia presence and NGOs, and slightly lower rental prices, while educational patterns seem very similar. The DiD design is valid given the parallel trends assumption, which states that in the absence of treatment, dropout rates for treated and control schools would follow similar trends. Given that treated areas have higher NGOs activity but also higher Mafia presence and lower rental prices, it is uncertain whether my findings would underestimate or overestimate the true treatment effect. I employ an event study approach to partially relax the concern of differential trends. The event study estimation based on Equation (1) may yield biased results due to well-documented limitations of TWFE models in settings with staggered treatment adoption and heterogeneous treatment effects (Goodman-Bacon, 2021; Sun and Abraham, 2021; Callaway and Sant'Anna, 2021). I employ the estimator proposed by Sun and Abraham (2021), which creates an interaction-weighted estimator of the average treatment effect (ATT) including dummies for the interactions of each cohort with their treatment times[19].

5.2 DiD dynamic model

The assumption of homogeneous exposure effects across all students within a catchment area may not reflect reality. The impact of reused Mafia properties probably varies depending on the intensity of reuse activity intended as reused properties accumulate over time. To capture the intensive margin effects, I use the total number of reused assets per catchment area as a continuous treatment intensity measure, employing the dynamic DiD estimator from de Chaisemartin and D'Haultfœuille (2020). This estimator extends the traditional two-way fixed effects framework to handle continuous treatment variables by comparing changes in outcomes for units experiencing different *doses* of treatment. Traditional event study approaches assume binary treatment and cannot handle the continuous variation in exposure intensity that characterises this setting. Moreover, the TWFE estimator assumes linear dose-response relationships, and cannot properly identify dynamic treatment effects. This estimator addresses these issues by allowing for non-linear dose-response functions and heterogeneous treatment effects across the distribution of treatment intensity. Finally, I estimate the treatment intensity by weighting this measure by the catchment area's student population (ages 14-19) and by the average distance between the properties to the population-weighted centroids of the schools' catchment areas; these adjustments are crucial since the intensity of the treatment effect depends not only on the number of reused properties but also on how many students could potentially be affected.

[19]This estimator allows me to include several fixed effects and time trends in Appendix C

6 Results

After the first Mafia property get reused within the school catchment area, dropout rates for students aged 16 or older fell on average. The estimated ATTs are presented in Table 4, where all specifications include schools and time FE with standard errors clustered at the school level. Column (1) shows that having at least one reused Mafia property reused within the catchment area reduces the dropout rate of 1.9 percentage points. Given the baseline dropout rate, this represents a relative 35% reduction in dropout rate. Columns (2) and (3) demonstrate that the estimated effects are robust to the introduction of controls for both migration dynamics between the first and the third year of high school and grade retention among students older than 16.

Table 4 Impact of reusing Mafia real estate on the share of students dropping out after the age of 16

	(1)	(2)	(3)	(4)
	Dropout from year 3 to 5 (aged 16-19yo)			
Reuse = 1	-0.0192**	-0.0200**	-0.0191**	-0.0201**
	(0.00934)	(0.00943)	(0.00905)	(0.00910)
clustered SE	yes	yes	yes	yes
school FE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
migration	no	yes	no	yes
retention	no	no	yes	yes
Observations	1,296	1,292	1,274	1,272
Number of schools	235	234	234	234
Mean dep. var.	0.0537	0.0534	0.0530	0.0531

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Column (1) represents the baseline accounting for school and time fixed effects, while in Columns (2) and (3) I control for students' migration and grade retention rate, respectively. Column (4) report the complete specification. Standard errors are clustered at the school level.

Figure 5 shows the event study of my preferred specification, namely Column (4), which accounts for school FEs, time FEs, and controls. The event study does not show any evident violation of the PTA; additionally, I cannot reject the hypothesis that the pre-treatment coefficients are jointly zero, as shown by the F-tests with a p-value of 0.991. The event study shows that the estimated effects are mostly developing in the long-term: the dropout rate becomes significantly lower between the second and the third year of implementation, while we see lower trends up to 6 years following the start of the reusing

activities. The timing of the treatment variable does not account for the implementation delays inherent in reusing confiscated mafia real estate, which can be due to the fact that we know that a project starts whenever the local NGOs and the municipalities sign a collaboration agreement in this real estate; it is reasonable that some time is needed to develop impactful activities for the local communities. These insights follow what suggested by previous literature: Nazzaro (2021) explains that NGO projects face substantial obstacles before becoming fully operational after receiving confiscated assets. The long-term effect I find aligns with the theoretical understanding of cultural change processes in anti-mafia contexts, where meaningful change occurs through the gradual buildup of small interventions and sustained community engagement over several years. (Nazzaro, 2021).

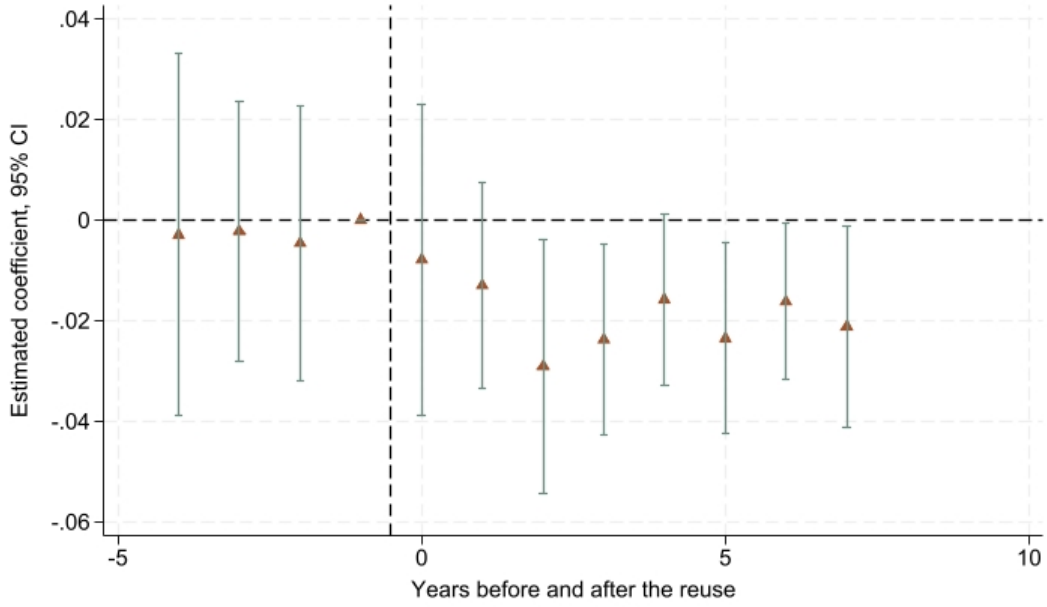
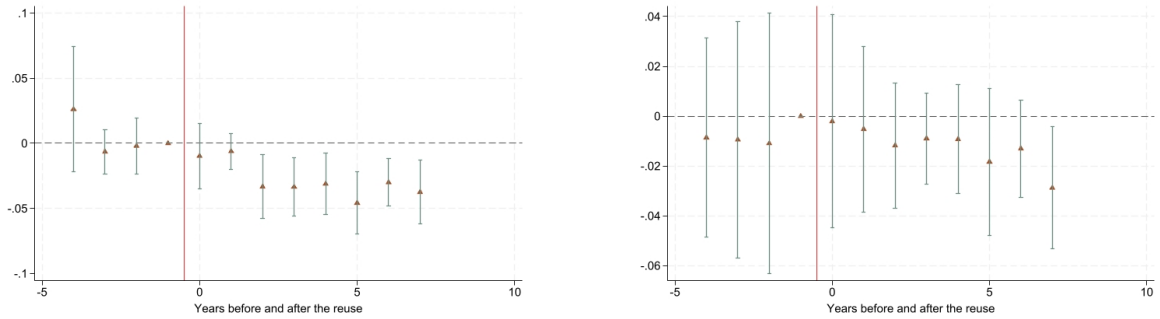


Figure 5 Estimated effects of reusing practices on dropout rate before and after the reuse starts

Figure 6 presents the ATE of reusing practices on the treated school catchment areas by the level of school quality, which is measured at the baseline as the schools' institutional effectiveness across all academic, organizational, and social dimensions. Figure 6a shows the effect of the first reused Mafia property on dropout rates in low-performing schools where the school quality indicator falls below the median, while Figure 6b shows the same effect for high-performing schools where the indicator falls above the median. Both F-tests suggest the absence of different pre-trends, with p-values of 0.143 for low-performing schools, and 0.941 for high-performing schools. Low-performing schools benefit more from the treatment, showing larger magnitude effects and stronger statistical significance from 2 years after the reuse onwards. This heterogeneous response suggests that the interven-

tion operates through mechanisms that are particularly effective in resource-constrained environments, where marginal improvements in facilities, community engagement, or institutional capacity generate larger returns on educational outcomes.



(a) Low Performing Schools

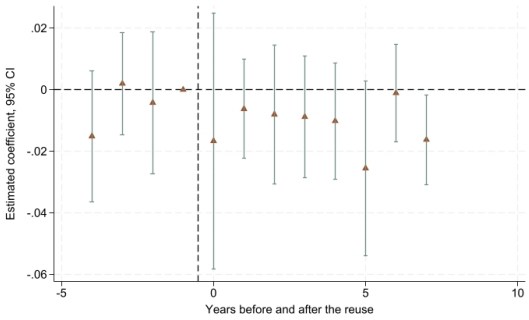
(b) High Performing Schools

Figure 6 Estimated effects of reusing practices on dropout rates before and after the reuse starts by the baseline quality of the school

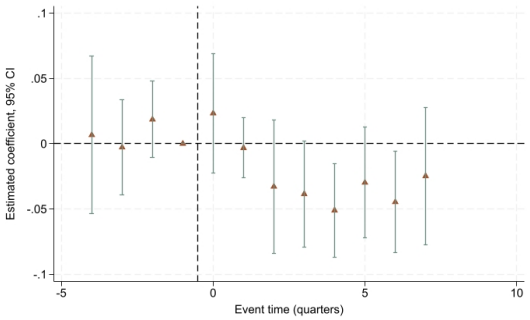
I also explore heterogeneity by school track type. As explained in Section 3, the Italian secondary educational system is divided in 14 specific high school sub-tracks, which can be grouped into three main tracks: academic, technical, and vocational high schools. I estimate three separate event studies to investigate whether the treatment effect shows different patterns for different tracks. The respective F-tests reveal p-values of 0.421, 0.651, and 0.333, confirming that I cannot reject the hypothesis that pre-treatment coefficients are jointly zero.

The results reveal substantial heterogeneity in how different educational tracks respond to the reuse intervention. First, academic high schools shown in Figure 7a exhibit coefficients that are relatively small and mostly insignificant throughout the observation period. Second, vocational high schools shown in Figure 7c display a mixed pattern with mostly insignificant effects, which is consistent with the institutional structure where students naturally exit after obtaining their three-year professional certificate. Last, Figure 7b shows technical high schools exhibit a more pronounced and sustained response, with clear negative effects on dropout rates that become statistically significant between year 2 and year 4 after reuse and persist throughout the post-treatment period. This heterogeneous response likely reflects the different student populations and institutional contexts of each track. Technical schools, which occupy a middle ground between academic preparation and vocational training, appear to benefit most substantially from the reuse intervention. Research on the Italian education system shows that technical schools have experienced significant declines in their transition rates to tertiary education, falling more sharply than other school types (Contini and Salza, 2020), suggesting these students face particular challenges in their educational trajectories. Technical education students often come from backgrounds that value practical skills alongside aca-

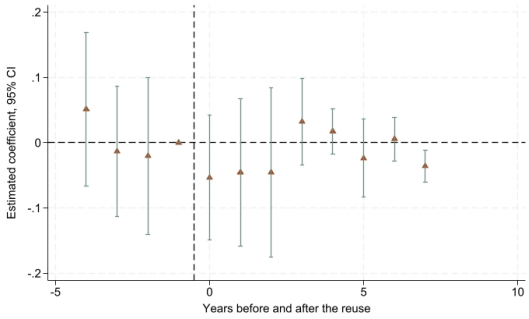
demic preparation, making them particularly sensitive to the quality of their learning environment. Unlike vocational students who may naturally exit after three years with their professional certificates, technical school students are expected to complete the full five-year program, making retention through to graduation more critical. For these reasons, the improved educational incentives from reuse practices may be especially valuable for technical programs. Importantly, this differential improvement in dropout rates is not driven by changes in enrollment composition. Technical schools show no significant change in total enrollment following building reuse, suggesting the effect operates through improved retention rather than student selection.



(a) Academic High Schools



(b) Technical High Schools



(c) Vocational High Schools

Figure 7 Estimated effects of reusing practices on dropout rates before and after the reuse starts by school track

The observed heterogeneous effects raise important questions about the mechanisms driving these differential impacts. Beyond school characteristics, the treatment effect may also depend on the number of Mafia properties reused and their actual distribution across the school catchment area. I therefore explore the dynamic evolution of the treatment effect generated by the reuse of confiscated Mafia properties, examining whether the observed patterns are driven solely by the first asset reused or by the cumulative exposure to multiple reused properties over time. The underlying hypothesis is that the effects of reuse activities on student outcomes may not materialize immediately after the first reuse. Instead, they are expected to unfold dynamically, depending on both the timing of reuse

events and the intensity of exposure within a catchment area. In particular, treatment effects may become stronger as the count of reused assets increases and as their location overlaps more closely with the distribution of the student population. I first split the sample between schools where at most one Mafia property has been reused across the entire period and schools that experience multiple reuse practices. Table 5 reports the results, revealing a clear dose-response relationship between reusing practices and dropout reduction. Schools exposed to only one reused property (columns 1-2) show modest and largely non-significant effects on dropout rates. In contrast, schools with multiple reused properties (columns 3-4) exhibit substantially larger and statistically significant reductions in dropout rates, respectively with 51% and 48% reeduction relative to the mean. This pattern suggests that the cumulative exposure to multiple reused assets amplifies the treatment effect, supporting the hypothesis that sustained intervention intensity is crucial for generating meaningful improvements in educational outcomes.

Table 5 Impact of reusing Mafia real estate on the share of students dropping out at the age of 16 by intensity of exposure

	(1)	(2)	(3)	(4)
Dep: Dropout 3-5 years	**Properties reused = 1**		**Properties reused > 1**	
Reuse = 1	-0.00284	-0.00466	-0.0293**	-0.0277**
	(0.0133)	(0.0139)	(0.0123)	(0.0119)
Observations	541	522	755	750
Number of codd	101	101	134	133
clustered SE	yes	yes	yes	yes
school FE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
migration	no	yes	no	yes
retention	no	yes	no	yes
Observations	541	522	755	750
Number of schools	101	101	134	133
Mean dep. var.	0.0485	0.0477	0.0574	0.0568

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Columns (1) and (3) do not include controls while Columns (2) and (4) include them. Standard errors are clustered at the school level.

Second, I take a step forward and I explore the dynamic evolution of the treatment effect generated by the reuse of confiscated Mafia properties. I perform three subsequent exercises: first, I estimate a dynamic difference-in-differences (DiD) model using an event study approach. This framework allows me to trace the evolution of the treatment effect relative to the timing of reuse and to assess whether the observed impacts arise from a gradual buildup of exposure to reusing activities. I employ the estimator proposed by

de Chaisemartin and D'Haultfœuille (2024), which accounts for the variation in the timing and intensity of treatment. This approach computes the cumulative effect of each treatment dose across all time periods and determines how long these effects persist on average. (de Chaisemartin and D'Haultfœuille, 2024). Appendix C display the results of the dynamic evolution of the treatment effect. The control and treated groups do not appear to exhibit differential pre-trends, as indicated by an F-test on the pre-treatment coefficients with a p-value of 0.330. To estimate the event study, I also include a time trend capturing the number of reuses at the baseline.[20]. Figure 9 from Appendix C shows the average cumulative effect per dose of reusing Mafia properties on dropout rates, where each coefficient represents the total impact of adding one more reused property that will accumulate over all future periods. The overall average total effect is negative and equal to 0.68 percentage points, indicating that each additional reused property on average reduces dropout rates by around 12 % relative to the mean across all time periods. Additionally, Mafia properties reused in the first or second year of treatment generate minimal cumulative effects, while properties reused five years after the first time of treatment reduce dropout rates by approximately 10 percentage points cumulatively. This pattern suggests that sustained, long-term programs hosted in reused Mafia properties generate substantially larger benefits than isolated activities. I re-estimate the event study by weighting the count of reused assets by the student population in each school catchment area. While the count-based measure captures the intensity of reuse activities within each catchment area, it does not account for the varying size of the student population that could potentially benefit from these interventions. This population-weighted specification allows me to employ a measure that reflects the concentration of reuse activities relative to the number of potential beneficiaries across different demographic contexts. Figure X shows that the results from the population-weighted specification are remarkably similar to those obtained using the simple count measure. This consistency suggests that the treatment effects are relatively stable across different measures of exposure intensity, indicating that the benefits of asset reuse do not appear to be significantly diluted by larger student populations within catchment areas. Finally, I run a distance-weighted specification, where I consider the average distance of reused Mafia properties from the population-weighted centroids, which confirms the previous results.

Furthermore, in Appendix C I report robustness checks, where I replicates the event studies computing bootstrapped standard errors with 500 repetitions [21].

[20] In the baseline estimator, I account for reusing practices that started before the beginning of the sample by replacing the dummy indicator with a value of 1 whenever at least one Mafia property had already been reused. In this case, the time trend controls for the prior exposure to reuse activities, ensuring that the estimated effects are not driven by pre-sample reuse.

[21] As suggested by de Chaisemartin and D'Haultfœuille (2024), when using the continuous treatment option with their estimator, the analytical variance estimators may be liberal if the polynomial order is over-specified, making bootstrap inference preferable for robust statistical inference.

6.1 Robustness and Falsification Checks

The estimated effects of the reusing practices on dropout rates are robust to several tests and changes in the treatment assumptions. This section is structures as follows: first, I test sensitivity to school catchment area construction by incorporating school capacity and student population constraints, following a stricter location-allocation approach. Second, I examine whether the results are driven by confounding factors including reallocations, differential time trends, and varying levels of local civic engagement and economic activity. Third, I test for spatial spillover effects to neighboring schools. Finally, I conduct falsification tests to rule out treatment anticipation effects and other alternative explanations.

6.1.1 Schools' catchment areas construction

As introduced in Section 3, I re-estimate the main effect of the treatment on dropout rates for students older than 16 by changing the assumptions underlying the way I construct schools' catchment areas. If the effect is artificially driven by the way I compute the treatment, I would expect no effect once those assumptions are changed. Table 6 shows that when relying on a stricter location-allocation approach[22], the results appear quite robust. In terms of magnitude they remain unchanged, while given the presence of a smaller sample[23] the results are almost significant at the 10% level across all specifications, with p-values of 0.103 and 0.101 from Columns (3) and (4).

[22] Appendix A explains in detail how the construction of the areas has been computed.

[23] As explained in Appendix A, several census blocks are automatically dropped given the stricter approach.

Table 6 Impact of reusing Mafia real estate on the share of students dropping out at the age of 16 - different catchment areas assumptions

	(1)	(2)	(3)	(4)
	Dropout from year 3 to 5 (16-19yo)			
Reuse = 1	-0.0207*	-0.0207*	-0.0202	-0.0204
	(0.0123)	(0.0124)	(0.0123)	(0.0124)
clustered SE	yes	yes	yes	yes
school FE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
migration	no	yes	no	yes
retention	no	no	yes	yes
Observations	1,205	1,201	1,183	1,181
Number of schools	227	226	226	226
Mean dep. var.	0.0535	0.0532	0.0528	0.0529

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Column (1) represents the baseline accounting for school and time fixed effects, while in Columns (2) and (3) I control for students' migration and grade retention rate, respectively. Column (4) report the complete specification. Standard errors are clustered at the school level.

6.1.2 Pre-Repurpose Policy Effects

As explained in Section 2, the reuse of Mafia property represents the final stage of the CRR policy, which requires first confiscating and then reallocating the property under the jurisdiction of the local authorities. Boeri et al. (2023) demonstrate that the confiscation of nearby Mafia properties leads to decreased housing prices by signalling the local presence of the Mafia. Conversely, they show that reallocation sends the opposite signal, increasing housing prices. A potential concern is that my estimated effects capture a recovery process following multiple confiscations that negatively impacted neighborhoods, reduced local economic activity, and contributed to higher dropout rates.The event studies do not show evidence of pre-trends, which alleviates worries that the results are driven by a natural recovery process following confiscations[24].

Another explanation would be that the reuse treatment is merely absorbing the reduction on dropout rates which is driven by the reallocation treatment. I argue that this is implausible for two main reasons: first, reallocation represents a purely administrative process whereby confiscated Mafia properties are formally transferred to local authorities. While this bureaucratic step may signal municipalities' intentions to repurpose former

[24]Due to limited availability of geolocated data on confiscated Mafia properties, I employ aggregate time trends in baseline confiscations rather than spatially precise measures. This approach captures differential exposure to confiscation activity across areas while acknowledging the data constraints.

Mafia properties, it generates no tangible changes at the community level, nor any additional activity that could alter youth perspectives or educational decisions. Second, Columns (3) and (4) of Table 6 provide direct empirical evidence supporting my argument: reallocation shows no independent effect on dropout rates, with coefficients close to zero and consistently insignificant across specifications. In contrast, the reuse coefficient remains stable in magnitude and statistically significant at the 10% level, demonstrating that meaningful educational impacts emerge only when assets are actively repurposed for community benefit rather than simply transferred to public ownership.

Table 7 Impact of reusing Mafia real estate on the share of students dropping out at the age of 16 - including previous policy stage

	(1)	(2)	(3)	(4)	(5)	(6)
	Dropout for the years from 3 to 5 (16-19yo)					
Reuse = 1	-0.0157*	-0.0153**			-0.0169*	-0.0158*
	(0.00881)	(0.00762)			(0.00870)	(0.00812)
Reallocation = 1			0.00477	0.000341	0.00299	-0.00139
			(0.00653)	(0.0107)	(0.00654)	(0.0106)
clustered SE	yes	yes	yes	yes	yes	yes
school FE	yes	yes	yes	yes	yes	yes
time FE	yes	yes	yes	yes	yes	yes
migration	no	yes	no	yes	no	yes
retention	no	yes	no	yes	no	yes
Observations	1,487	1,403	1,286	1,227	1,286	1,227
Number of schools	293	280	233	226	233	226
Mean dep. var.	0.0552	0.0582	0.0537	0.0564	0.0537	0.0564

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Columns (1), (3) and (5) do not include controls while Columns (2), (4) and (6) include them. Standard errors are clustered at the school level.

6.1.3 Spillover effects

In the main results, I compare treated schools to control schools without accounting for potential spillover effects. However, it is plausible that the treatment also reduces dropout rates in nearby schools that are not formally treated. In such cases, the estimates would violate the Stable Unit Treatment Value Assumption (SUTVA), which requires that each unit's potential outcomes are independent of other units' treatment status (Cunningham, 2021). To address this concern, I follow the standard approach in the difference-in-differences literature: either excluding potentially affected controls or introducing an indicator for spillover exposure to separate the direct and spillover components of the treatment effect (Kline and Moretti, 2014; Butts, 2023). Because my sample includes only a limited number of control schools located far from treated areas, I opt for

the second option and construct a time-varying spillover dummy. This variable equals 1 if a school's catchment area shares at least one boundary with a treated area after treatment occurs, and 0 otherwise.
Table 8 reports the results. Columns (1) is the baseline, which ignores spillovers. Column (2) controls for spillovers, estimating a direct effect which is slightly smaller, around 1.6 percentage points; the spillover effect appears to be insignificant, but with a substantial reduction of the dropout rate of nearby untreated areas of 1.6 percentage points. In Columns (3) and (4), I restimate the same specifications but including controls, showing similar patterns. This test indicates that ignoring spillovers leads to a modest overestimation of the direct treatment effect, but the overall conclusion remains robust: reusing confiscated properties significantly lowers school dropout rates.

Table 8 Impact of reusing Mafia real estate on the share of students dropping out at the age of 16 - controlling for spillover effects

	(1)	(2)	(3)	(4)
	Dropout rate from years 3 to 5 (16-19yo)			
Reuse = 1	-0.0192**	-0.0177**	-0.0178**	-0.0160**
	(0.00934)	(0.00892)	(0.00853)	(0.00799)
Spillover = 1		-0.0116		-0.0149
		(0.0136)		(0.0151)
clustered SE	yes	yes	yes	yes
catchment school FE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
migration	no	no	yes	yes
retention	no	no	yes	yes
Observations	1,296	1,296	1,237	1,237
Number of schools	235	235	228	228
Mean dep. var.	0.0537	0.0537	0.0563	0.0563

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Columns (1) and (2) do not include controls while Columns (3) and (4) include them. Standard errors are clustered at the school level.

6.1.4 Anticipation Effects

As a placebo exercise, I test whether the reuse of confiscated Mafia real estate in time $t+1$ affects dropout rates measured in time t. A significant coefficient would indicate the presence of anticipation effects — that is, families and students might adjust their behaviour in advance of the NGO's activities because information about future reuse of Mafia properties spreads through informal or institutional channels.

Table 9 shows that the estimated coefficients for the placebo treatment are consistently negative but small in magnitude and not statistically significant across all specifications.

This suggests that dropout rates do not respond before the actual reuse takes place. In other words, there is no evidence of anticipation effects, reinforcing the credibility of the main identification strategy: the decline in dropout rates occurs only after the confiscated properties get reused, when NGOs start offering social activities in the treated area.

Table 9 Impact of reusing Mafia real estate on the share of students dropping out after the age of 16 - Reuse t + 1

	(1)	(2)	(3)
	Dropout rate for the years from 3 to 5 (16-19yo)		
Reuse t + 1	-0.0119	-0.0120	-0.00960
	(0.00884)	(0.00838)	(0.00848)
clustered SE	yes	yes	yes
catchment school FE	yes	yes	yes
time FE	yes	yes	yes
migration	no	yes	yes
retention	no	no	yes
Observations	1,062	1,034	1,024
R-squared	0.097	0.208	0.244
Number of schools	232	226	226
Mean dep. var.	0.0508	0.0542	0.0544

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Column (1) does not include controls while Columns (2) includes a control for students' migration. Column (3) includes all controls. Standard errors are clustered at the school level.

Moreover, Table 10 shows the results of estimating the effect of the reuse on the share of students leaving the school before any of them turn 16 - the measure we use to control for students' migration. This serves as a placebo test, as students under 16 are legally required to remain in education and cannot freely abandon school, unlike the main outcome variable, which focuses on dropout rates for students older than 16 who have the legal right to leave education. The results confirm that the reuse intervention has no significant effect on early departure rates with a coefficient very close to zero, providing reassurance that the main findings are driven by genuine improvements in educational retention rather than changes in student mobility.

Table 10 Impact of reusing Mafia real estate on the share of students dropping out before the age of 16

	(1)	(2)
	Dropout from year 1 to 3 (13-15yo)	
Reuse = 1	0.0004	0.0003
	(0.00192)	(0.00193)
clustered SE	yes	yes
catchment school FE	yes	yes
time FE	yes	yes
retention	no	yes
Observations	1,203	1,183
Number of codd	226	226
Mean dep. var.	0.349	0.349

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Column (1) does not include controls while Columns (2) includes them. Standard errors are clustered at the school level.

6.1.5 Alternative explanations

To ensure that the observed effects are not driven by concurrent municipality-level interventions, I test whether the reuse of confiscated properties coincides with other educational or social cohesion programs implemented during the same timeframe. Table 11 presents results controlling for the presence of educational programs and social cohesion initiatives implemented at the municipal level at the same time of the reuse practices. Data have been obtained from *opencoesione.gov.it* (Department for Cohesion Policy, 2012) about the number of projects implemented in the municipality considering my time frame. The coefficient on the reuse treatment remains statistically significant and substantively unchanged across all specifications, ranging from -0.0193 to -0.0210. Crucially, neither educational programs nor social cohesion programs show any significant association with dropout rates, with coefficients close to zero and large standard errors. This suggests that the dropout reduction effect is specifically attributable to the reuse intervention rather than being part of broader municipal development strategies or coincidental policy implementations targeting education and social outcomes.

Table 11 Alternative explanations: controlling for concurrent municipal programs

	(1)	(2)	(3)	(4)
	Dropout rate for the years from 3 to 5 (16-19yo)			
Reuse = 1	-0.0193**	-0.0203**	-0.0198**	-0.0210**
	(0.00903)	(0.00918)	(0.00867)	(0.00876)
Educational programmes	-0.000777	-0.00533	0.00289	-0.00136
	(0.0146)	(0.0139)	(0.0151)	(0.0144)
Social cohesion programmes	-0.000929	-0.00334	-0.00755	-0.00869
	(0.0157)	(0.0153)	(0.0185)	(0.0184)
Clustered SE	yes	yes	yes	yes
Catchment school FE	yes	yes	yes	yes
Time FE	yes	yes	yes	yes
Migration controls	no	yes	no	yes
Retention controls	no	no	yes	yes
Observations	1,269	1,265	1,248	1,246
Number of schools	235	234	234	234
Mean dep. var.	0.0538	0.0535	0.0530	0.0531

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Column (1) does not include controls while Columns (2) includes controls for migration. Column (3) includes only the controls for grade retention rate, while Column (4) include them all. Standard errors are clustered at the school level.

6.2 Mechanisms

The activities provided by repurposing Mafia properties contribute to reducing dropout rates in areas where at least one of these properties has been reused for social purposes. The estimated effects are stronger for vocational schools, academically underperforming schools, and schools located in more deprived areas. Additionally, the results show a dose-response relationship where each additional repurposed Mafia property generates incrementally larger effects on dropout reduction in treated areas. In this section, I discuss the mechanisms underlying these treatment effects through four key arguments: first, I reject gentrification as a primary channel; second, I demonstrate that activities provided in repurposed Mafia properties cannot be easily substituted by other NGO activities; third, I show that results are not solely driven by increased educational support that merely improves academic performance; finally, I argue that repurposed Mafia properties may play a transformative role by directly influencing students' perceptions of education's importance and reducing the Mafia's attractiveness by providing alternative role models.

I rule out gentrification as the main channel of the estimated effects by employing triple difference-in-differences design. I interact my treatment dummy with a continuous indicator of rental prices measured at the neighbourhood level, specified as:

$$Dropout16_{c,n,m,t} = \beta_1 Reuse_{c,t} \times Prices_{n,t} + \beta_2 X'_{c,t} + \delta_c + \eta_t + \epsilon_{c,n,m,t} \quad (3)$$

where $Dropout16_{c,n,m,t}$ is the main outcome as specified before and *Reuse* is the main treatment dummy equal to 1 whenever there is at least one reused property in schools catchment area c in time t, and 0 otherwise. *Prices* measures the average rental prices in neighbourhood n at time t, while β_1 is the coefficient of interest which captures how the impact of repurposed Mafia properties on dropout rates varies with local property price dynamics. $X'_{c,t}$ is a vector of time-varying community-level variables controlling for students' migration and grade retention dynamics. δ_c is school fixed effects and η_t is time fixed effects.

If the main effect operates through neighborhood upgrading and gentrification, I would expect the treatment effect to be stronger in areas experiencing rental price increases. Table 12 shows the results; the coefficient of interest of the interaction between the reuse treatment and rental price changes is very close to zero and not statistically significant, making the effect of rental price changes on dropout rates virtually identical in areas with and without repurposed properties. Moreover, the results are robust to the inclusion of migration and grade retention controls. These results support the idea that the specific activities and programs do not reduce dropout rates through a more general gentrification effect on the neighbourhood.

Table 12 Impact of reusing Mafia real estate on the share of students dropping out at the age of 16 interacted with rent price

	(1)	(2)	(3)	(4)
	Dropout rate from the years 3 to 5 (16-19yo)			
Reuse = 1	-0.0144	-0.0208	-0.0137	-0.0213
	(0.0375)	(0.0383)	(0.0372)	(0.0380)
Rental Prices	-0.000801	-0.00469	-0.00128	-0.00475
	(0.00709)	(0.00695)	(0.00691)	(0.00681)
Reuse =1 X Rental Prices	-0.000566	0.000127	-0.000626	0.000191
	(0.00382)	(0.00390)	(0.00375)	(0.00383)
clustered SE	yes	yes	yes	yes
school FE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
migration	no	yes	no	yes
retention	no	no	yes	yes
Observations	1,296	1,292	1,274	1,272
Number of codicescuolas	235	234	234	234
Mean dep. var.	0.0537	0.0534	0.0530	0.0531

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Column (1) does not include controls while Columns (2) includes controls for migration. Column (3) includes only the controls for grade retention rate, while Column (4) include them all. Standard errors are clustered at the school level.

Second, since the activities organised in reused Mafia properties are mainly managed by the local NGOs, it is essential to test whether the main results are purely driven by the overall presence of local NGOs, which is measured as the number of NGOs at the street level. This way, I can test whether the impact of Mafia property reuse is complementary to or substitutable with other civil society activities.

$$Dropout16_{c,n,m,t} = \beta_1 Reuse_{c,t} + \beta_2 NGOs_{c,t} + \beta_3 X'_{c,t} + \delta_c + \eta_t + \epsilon_{c,n,m,t} \tag{4}$$

where β_2 is the coefficient measuring the effect of the street-level presence of NGOs in the school catchment area c in t , and the rest of the notation is reported as before. Is there something uniquely valuable about conducting activities in former Mafia properties, or would any NGO services in the area produce similar dropout reductions? If the observed effects were merely due to the presence of social services in the area regardless of their location in repurposed Mafia properties, we would expect β_1 to diminish substantially when controlling for other NGO presence. However, if β_1 remains stable while β_2 shows little effect, this would demonstrate that the symbolic and contextual significance of

operating within former Mafia properties creates unique value that cannot be substituted by other conventional NGO activities. Table 13 shows that activities offered in repurposed Mafia properties cannot be easily substituted by other conventional NGO services. First, Columns (2) and (5) reveal that the presence of other NGOs in school catchment areas has negligible and statistically insignificant effects on dropout rates, suggesting that general NGO activities do not meaningfully reduce educational dropout. Second, the repurposing effect remains remarkably stable when controlling for other NGO presence. Comparing the baseline specifications in columns (1) and (4) with the full specifications in columns (3) and (6), the reuse coefficients show virtually no change in magnitude and maintain statistical significance at the 5% level across all specifications. This exercise provides compelling evidence that the observed effects are not driven by general social service provision in the area, but rather by the contextual significance of conducting activities within former Mafia properties.

Table 13 Impact of reusing Mafia real estate and NGO presence on dropout rates (16–19yo)

	(1)	(2)	(3)	(4)	(5)	(6)
	Dropout rate for the years from 3 to 5 (16–19yo)					
Reuse = 1	-0.0192**		-0.0191**	-0.0196**		-0.0194**
	(0.00934)		(0.00960)	(0.00945)		(0.00963)
NGOs presence		-0.000590	-0.000626		-0.000542	-0.000583
		(0.000392)	(0.000389)		(0.000351)	(0.000354)
clustered SE	yes	yes	yes	yes	yes	yes
catchment school FE	yes	yes	yes	yes	yes	yes
time FE	yes	yes	yes	yes	yes	yes
migration	no	yes	no	yes	no	yes
retention	no	yes	no	yes	no	yes
Observations	1,296	1,487	1,296	1,272	1,447	1,272
Number of codicescuolas	235	293	235	234	288	234
Mean dep. var.	0.0537	0.0552	0.0537	0.0531	0.0541	0.0531

Notes: TWFE model. The treatment variable is equal to 1 whenever there is at least one Mafia property within the school catchment area. Columns (1), (3), and (5) do not include controls while Columns (2), (4), and (6) include them all. Standard errors are clustered at the school level.

Having established that repurposed Mafia properties offer non-substitutable services, I now examine whether these effects operate primarily through enhanced educational provision. If the mechanism were simply providing additional educational resources, we would expect stronger effects from properties dedicated to educational activities compared to those focused on social and cultural services. To test this, I interact the treatment binary indicator with a time-invariant indicator which equals to 1 whenever the house has

being reused for activities related to education and job training. I define the specification as follows:

$$Dropout16_{c,n,m,t} = \beta_1 Reuse_{c,t} \times Education_c + \beta_3 X'_{c,t} + \delta_c + \eta_t + \epsilon_{c,n,m,t} \quad (5)$$

where β_1 is the coefficient of interest capturing how the impact of repurposed Mafia properties on dropout rates varies if the purpose of the activity is or is not educationally related. The other notation is reported as before.
The results, presented in Table 14, reveal several important findings. First in Columns (3) and (4) baseline effect of reusing Mafia properties remains negative and statistically significant at the 10% level; crucially, the interaction coefficient is more than half in magnitude and statistically insignificant across all specifications. This lack of differential effects suggests that properties dedicated to educational activities do not generate stronger impacts on dropout reduction compared to those focused on social and cultural services.

Table 14 Impact of reusing Mafia real estate on dropout rates (16–19yo)

	(1)	(2)	(3)	(4)
	Dropout rate for the years from 3 to 5 (16–19yo)			
Reuse = 1	-0.0173	-0.0173	-0.0189*	-0.0191*
	(0.0106)	(0.0106)	(0.0106)	(0.0105)
Reuse = 1 × Edu	-0.00618	-0.00632	-0.000690	-0.00103
	(0.00934)	(0.00928)	(0.0101)	(0.0100)
clustered SE	yes	yes	yes	yes
catchment school FE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
migration	no	yes	no	yes
retention	no	no	yes	yes
Observations	1,296	1,294	1,274	1,274
Number of schools	235	234	234	234
Mean dep. var.	0.0537	0.0534	0.0530	0.0530

Notes:

These findings have important implications for understanding the underlying mechanism. The absence of enhanced effects from education-specific repurposing indicates that the dropout reduction benefits do not operate primarily through direct educational resource provision. Instead, the results suggest repurposed Mafia properties generate broader community-level benefits that transcend specific programmatic activities. To further investigate this, I examine how these interventions alter students' perceptions about

pathways to employment and career development in their communities. I employ TWFE models using data from the survey *The Perception of the Mafia*, which was collected from a subsample of schools in my dataset. The survey covers 54 schools with an average of 110 students per school. Of the total sample, 24 schools are treated while 30 serve as controls. I exploit responses to the question: *What do you think will be more useful for you to find a job in your town?* Students were asked to rate seven different pathways on a scale from 1 - as the most useful - to 7 as the most useless: taking an educational programme, referring to a job centre, competing for civil service, asking the Mafia, asking a politician, asking family, or asking a friend. If the reuse of Mafia properties and the related social activities successfully reduce the attractiveness of a criminal pathway and strengthen incentives to pursue formal education, we would expect students in treated areas to place greater value on formal channels and show diminished reliance on informal or illegitimate networks when seeking job opportunities. Table 13 presents results under a DiD design that includes school fixed effects and time fixed effects; I also weight each school by the number of students replying to the survey to account for varying school sizes in the survey sample. The outcome variables represent the percentage of students for each school who rated each pathway as either "very useless" or "very useful", allowing me to identify whether repurposed Mafia properties systematically alter the distribution of student perceptions within schools. Following previous literature (Villa, 2025), I focus on the extreme categories of student responses to better capture meaningful shifts in perceptions[25] Finally, standard errors are clustered at the school level across all specifications.

The results, presented in Table 15, reveal compelling evidence of altered student perceptions consistent with weakened criminal influence and strengthened belief in legitimate pathways. Panel A examines the probability of rating each pathway as "very useless". Most notably, students in areas with repurposed Mafia properties are significantly more likely to view "asking the Mafia" as very useless by 24% relative to the baseline mean of 0.564, indicating that a substantial portion of students already viewed Mafia connections as unhelpful, but the intervention further reinforces this perception. Similarly, students are more likely to rate "asking a politician" as very useless, representing a 26% increase from the baseline mean of 0.453. Panel B examines the probability of rating pathways as "very useful". Students in treated areas are significantly more likely to view education as very useful with a substantial 34% increase relative to the baseline mean of 0.480, indicating that the intervention meaningfully enhances students' perception of education as a pathway to employment success. Interestingly, while students become more likely to view civil service as very useful, this effect is not statistically significant, though the magnitude suggests a potential strengthening of trust in formal institutions. The coef-

[25] I measure the most useful choice as the percentage of students that rate each option with 1 or 2, and the most useless choice as the percentage of students that rate each option with 6 ot 7.

ficients for other formal channels and informal networks remain small and insignificant, suggesting the intervention's effects are specifically concentrated on reducing reliance on illegitimate networks while enhancing the perceived value of education. This fundamental shift in how students perceive opportunity structures likely contributes directly to the observed reduction in dropout rates, as students who believe education leads to better job prospects have stronger incentives to remain in school.

Table 15 Impact of reusing Mafia real estate on students' perceptions of what is useful to find a job in their town

	What do you think will be more useful to find a job in your town?						
	(1) Education	(2) Job centre	(3) Civil service	(4) Ask the Mafia	(5) Ask a politician	(6) Ask family	(7) Ask a friend
Panel A: Very useless							
Reuse = 1	-0.0516	-0.00243	-0.0772	0.136*	0.117*	-0.0788	-0.0575
	(0.0597)	(0.0612)	(0.0469)	(0.0780)	(0.0663)	(0.0614)	(0.0385)
Observations	161	161	161	161	161	161	161
Number of schools	56	56	56	56	56	56	56
clustered SE	yes	yes	yes	yes	yes	yes	yes
time FE	yes	yes	yes	yes	yes	yes	yes
school FE	yes	yes	yes	yes	yes	yes	yes
Mean dep. var.	0.159	0.196	0.163	0.564	0.453	0.197	0.208
Panel B: Very useful							
Reuse = 1	0.161**	0.0143	0.136	-0.110	-0.0755	0.0371	0.0492
	(0.0804)	(0.0719)	(0.0827)	(0.0793)	(0.0863)	(0.0405)	(0.0308)
Observations	161	161	161	161	161	161	161
Number of schools	56	56	56	56	56	56	56
clustered SE	yes	yes	yes	yes	yes	yes	yes
time FE	yes	yes	yes	yes	yes	yes	yes
school FE	yes	yes	yes	yes	yes	yes	yes
Mean dep. var.	0.480	0.400	0.426	0.280	0.280	0.303	0.273

Additionally, I analyse open-ended survey responses where students were asked to define what i the Mafia. This approach provides deeper insights into students' emotional and cognitive associations with the Mafia, moving beyond structured survey questions to capture more nuanced attitudinal changes. The survey collected written definitions of the Mafia from students across 46 schools, yielding 3,242 individual responses across 13 years. I employ natural language processing techniques to perform sentiment analysis of students' definitions. I robust my results using three established sentiment analysis algorithms Syuzhet, AFINN, and Bing scores, and I extract sentiment scores that capture

the overall emotional valence of each response. While Bing lexicon is only able to offer binary classification, Syuzhet scores are well-suited for analysing the narrative structure of students' written definitions, and the AFINN lexicon provides fine-grained intensity measures[26] (Silge and Robinson, 2017; Isasi, 2021; Kim, 2022). Additionally, I apply the NRC emotion lexicon to identify specific emotional dimensions: anger, disgust, fear, sadness, joy, trust, surprise, and anticipation expressed in students' definitions. This lexicon comprises English words and their associations with eight basic emotions, which was developed by human annotators rather than relying on automated methods (Mohammad and Turney, 2013). Following the same approach used for the survey answers, I employ a TWFE estimator to investigate the effect of the activities related to the reuse practices on the sentiments extracted from Mafia definitions. If the reuse of Mafia properties alters students' perceptions of the Mafia, we would expect to observe systematic differences in how students in treated versus control areas conceptualise and emotionally respond to the Mafia. Specifically, successful interventions might lead to more negative sentiment scores. Table 16 reports the results where all standard errors are clustered at the school level, showing consistent evidence of more negative sentiment among students after the reuse of nearby Mafia properties. The Syuzhet algorithm reveals a statistically significant decrease of 26 percentage points in sentiment scores, representing a meaningful shift from the baseline mean toward more negative narrative construction about the Mafia. The AFINN algorithm, which provides more granular intensity measures, shows an even stronger effect, suggesting students in areas with repurposed Mafia properties express more intense negative emotions when describing the Mafia. However, the binary Bing classification system shows only a modest and statistically insignificant decrease of 1.3 percentage points, indicating that while the intensity and narrative structure of negative sentiment increases, a binary categorisation may not capture the full nuance of attitudinal change.

[26]The Syuzhet score ranges from -1 to 1, while AFINN ranges from -5 to 5.

Table 16 Impact of reusing Mafia real estate on students' sentiment scores

	Sentiment analysis outcomes		
	(1)	(2)	(3)
	syuzhet_score	afinn_score	bing_score
Reuse = 1	-0.266**	-0.417**	-0.0130
	(0.112)	(0.195)	(0.150)
Clustered SE	yes	yes	yes
Time FE	yes	yes	yes
Schools FE	yes	yes	yes
Observations	3,242	3,242	3,242
Number of schools	46	46	46
Mean dep. var.	-0.710	-2.349	-0.854

Finally, I employ the NRC emotion lexicon to analyse eight distinct emotional categories: anger, disgust, fear, sadness, joy, trust, surprise, and anticipation. In Appendix C I report the most common terms appearing in the top 25% of responses for each emotion. Students expressing high levels of negative emotions frequently employ concrete terms directly related to violence and criminality. Fear-based definitions prominently feature words which reflect an understanding of the Mafia's coercive power, while anger-related responses include terms that show the students' awareness of how the Mafia's corrupt democratic institutions. Disgust-associated language features words indicating moral repugnance toward Mafia practices, while sadness-related terms demonstrate emotional responses to the costs related to the Mafia presence. Interestingly, the positive emotion categories reveal a more complex picture. Across joy, trust, and surprise categories, the term *money* emerges as the most frequent, suggesting that students are aware of the monetary gains and social status that make the Mafia attractive to some individuals.
Table 17 presents the results. Among negative emotions, fear emerges as the most consistent and robust response to the intervention. Students in treatment areas show increases in fear-based language of 25 percentage points, and this effect is statistically significant even when controlling for unobserved school characteristics and temporal trends. This suggests that exposure to repurposed Mafia properties genuinely enhances students' understanding of the Mafia's threatening and coercive nature. The analysis of positive emotions reveals a drop in the emotion of joy of 13 percentage points, suggesting that the intervention may actively reduce any romanticised or positive associations students might harbour toward the Mafia. Trust, surprise, and anticipation show minimal and generally insignificant changes, indicating these emotional dimensions are less responsive

to exposure to repurposed Mafia properties.

These findings collectively demonstrate that the reuse of confiscated Mafia properties serves as an effective intervention for reshaping young people's emotional responses to the Mafia as a career development pathway. The intervention appears to work primarily by intensifying fear-based understanding of the Mafia's harmful nature while simultaneously reducing any positive emotional associations, creating a more realistic and critical assessment of the Mafia impact on society.

Table 17 Impact of reusing Mafia real estate on students' emotional sentiments

Sentiment analysis outcomes				
	(1)	(2)	(3)	(4)
	Anger	Disgust	Fear	Sadness
Panel A: Negative sentiments				
Reuse = 1	-0.0151	-0.0637	0.254**	0.0764
	(0.140)	(0.0705)	(0.125)	(0.120)
Clustered SE	yes	yes	yes	yes
Time FE	yes	yes	yes	yes
School FE	yes	yes	yes	yes
Observations	3,242	3,242	3,242	3,242
Number of schools	46	46	46	46
Mean dep. var.	0.895	0.687	1.060	0.483
	(1)	(2)	(3)	(4)
	Joy	Trust	Surprise	Anticipation
Panel B: Positive sentiments				
Reuse = 1	-0.136*	-0.0221	-0.0180	-0.0153
	(0.0694)	(0.104)	(0.0777)	(0.0772)
Clustered SE	yes	yes	yes	yes
Time FE	yes	yes	yes	yes
School FE	yes	yes	yes	yes
Observations	3,242	3,242	3,242	3,242
Number of schools	46	46	46	46
Mean dep. var.	0.369	0.708	0.271	0.399

7 Conclusions

In this paper, I investigate the impact of the practice of reusing Mafia properties for social purposes on the educational outcomes of local juveniles, focusing on the share of students dropping out of high school. The reuse of Mafia real estate is the last step of the CRR policy implemented in Italy since 1996, and it comes after the property has been first

seized and then reallocated for social purposes, involving the ANBSC, the local municipalities and the local NGOs. Although the effect of seizures and reallocations has already been investigated by the existing literature, the localised effects of the reused Mafia real estate remain unexplored. Furthermore, the development outcomes of the Mafia-ridden communities - educational, and labour market outcomes - which are the specific target of the policy itself, have not been investigated so far. My research project wants to fill this research gap and shed new light on the implications of reusing Mafia real estate on educational outcomes. For this purpose, I create a novel panel database spanning from 2015 to 2022 where I merged different sources of quantitative and qualitative geolocated information about the reused Mafia properties. I leverage administrative data from the National Agency for the Management of Confiscated Mafia Properties to collect the precise locations of the Mafia properties, I employ additional data from local NGOs, and I digitise the Antimafia Investigative Directory maps to measure baseline Mafia presence. I collect the locations of all Italian NGOs from the Ministry of Labour database and use educational records from the Ministry of Education covering student enrollment, graduation rates, and students' age for each year. I focus on the ten main urban centres in historically Mafia-ridden regions—Naples, Salerno, Bari, Taranto, Foggia, Reggio di Calabria, Palermo, Messina, Catania, and Siracusa—which concentrate the majority of confiscated Mafia properties. Finally, I employ the Survey of the Perception of the Mafia Phenomenon collected by the Sicilian NGO Centro Studi Pio La Torre to examine student attitudes toward educational and criminal pathways. My research design exploits the variation in the staggered reuse of Mafia real estate resulted from the implementation of the CRR policy. Given the absence of official high school districts in Italy, I construct school catchment areas loosely following a location-allocation approach based on distances between high schools and census blocks. I created treated and control groups drawing schools catchment areas based on distance, and schools tracks, which represents the main factors affecting enrolling preferences. The school - my unit of analysis - is treated whenever it has at least one reused Mafia property within its catchment area. On the contrary, schools are part of my control group whenever they have no reused Mafia property within their catchment area. To measure the average treatment effect I exploit a two-way fixed effects (TWFE) models using a DiD design that compares educational outcomes in areas where Mafia properties are repurposed to those located in unaffected areas over the same period, complemented by event study specifications robust to dynamic and heterogeneous treatment effects following Sun and Abraham (2021). I can confirm that the reuse of Mafia real estate has an effect on the dropout rates of the nearby schools; indeed, the implementation of social activities in repurposed Mafia properties significantly reduces dropout rates by approximately 34% relative to the mean among students who have reached the age when formal education is no longer compulsory. This effect is proportionally consistent with previous research on the effect of the Mafia on education. The

effects are particularly strong in schools that reported lower baseline scores on a 1–7 self-assessment scale across multiple domains, including both student grade and performance in national standardised assessments, and particularly pronounced in areas deprived at baseline. The heterogeneity analysis at the school tracks level reveals that technical high schools emerge as the primary beneficiaries of the properties reuse interventions. I test the intensive margin of the treatment, finding that each additional confiscated asset is associated with an 18% decrease relative to the mean.

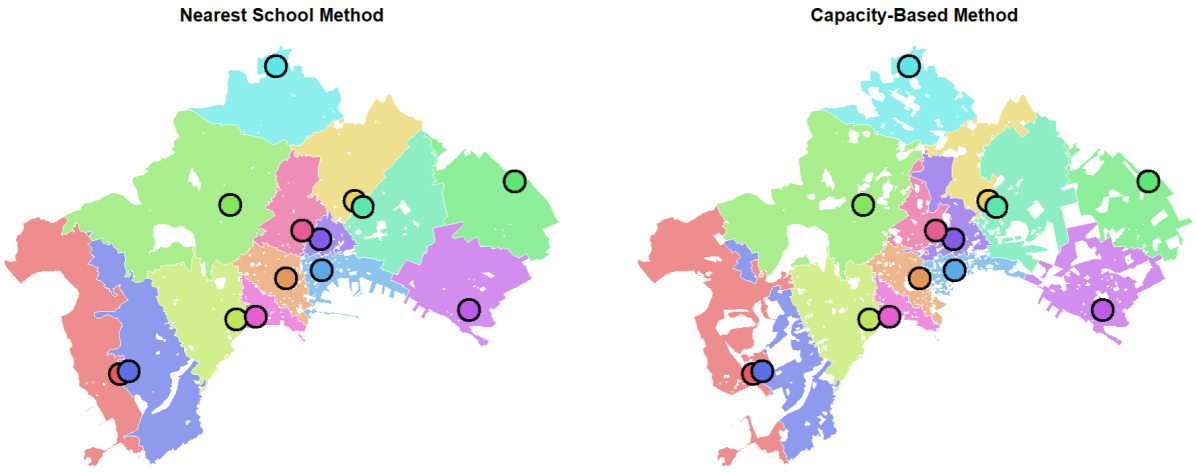
By conducting a mechanisms analysis, I discuss the main mechanisms which potentially drive the treatment effect: reuse activities provide legitimate role models and opportunities, redirecting youth perceptions from criminal influences toward education in previously Mafia-controlled areas. I perform sentiment analysis of how students define the Mafia, finding that their language becomes positively correlated with sentiments of fear and negatively correlated with feelings of joy. Meanwhile, I find that the treatment effect does not vary with the level of neighbourhood rental prices and thus is unlikely to be driven by gentrification processes, and the effect is not driven by properties specifically offering educational support. I then perform several falsification and robustness checks, confirming that the previous steps of the CRR policy are unlikely to drive the measured effect. Additionally, I rule out that the treatment is endogenous to the presence of NGOs and rental prices up to 3 years before the reuse, finding a zero effect. Finally, my robustness tests suggest that the spillover effects, alternative activities supporting education, and municipalities' compliance are unlikely to bias my results. From a policy perspective, these findings have important implications, especially considering Italy and other countries enforcing asset seizure policies against organised crime. First, my findings show that what plays a transformative role for the local infiltrated community is the effective reuse of Mafia real estate as public goods, as suggested by the well-developed literature addressing the need to shift from a repressive approach to a resilience-building approach. Second, additional efforts must be invested in streamlining the bureaucracy of the CRR policy. Indeed, although there is an obvious trade-off between a faster bureaucratic process and a careful investigation on a case-by-case basis, more than half of the reallocated real estate is currently not being reused for communal purposes. Reducing the time gap between reallocation and reuse could speed up the process of building a real alternative for many juveniles who decide to invest in a Mafia-related career rather than in their education. Last, given the recent drastic cut of the PNRR funds allocated to financing the reuse of Mafia real estate made by the government in 2023, these findings suggest that a change of course is needed more than ever in building social resilience against the Mafia in Italy.

8 Appendix

8.1 Appendix A: Data and Variable Definitions

This appendix provides additional information on the data and variables used in this analysis.

To test whether the results are sensitive to changes in the construction of school catchment areas, I build an alternative version of the boundaries, accounting for the student population living in each census block and each school's capacity. I proceed in two steps: first, I aggregate census blocks based on their closest school for each track specification; second, I match each census blocks to each school catchment area based on the population aged 14 to 19 living in each census block according to 2011 census data, and the yearly average sum of students enrolled in each school as a proxy of their capacity. Starting from a distance-based assignment, I reallocate census blocks to their second-nearest school only when their original assignment exceeds capacity. Census blocks are dropped when all nearby schools are over capacity, resulting in missing observations. Approximately half of all schools experience boundary changes under this method. Figure A1 illustrates this process using technical economic high schools in Naples. As expected, capacity-based catchment areas show different boundaries and increased missing observations compared to the distance-only method.[27]



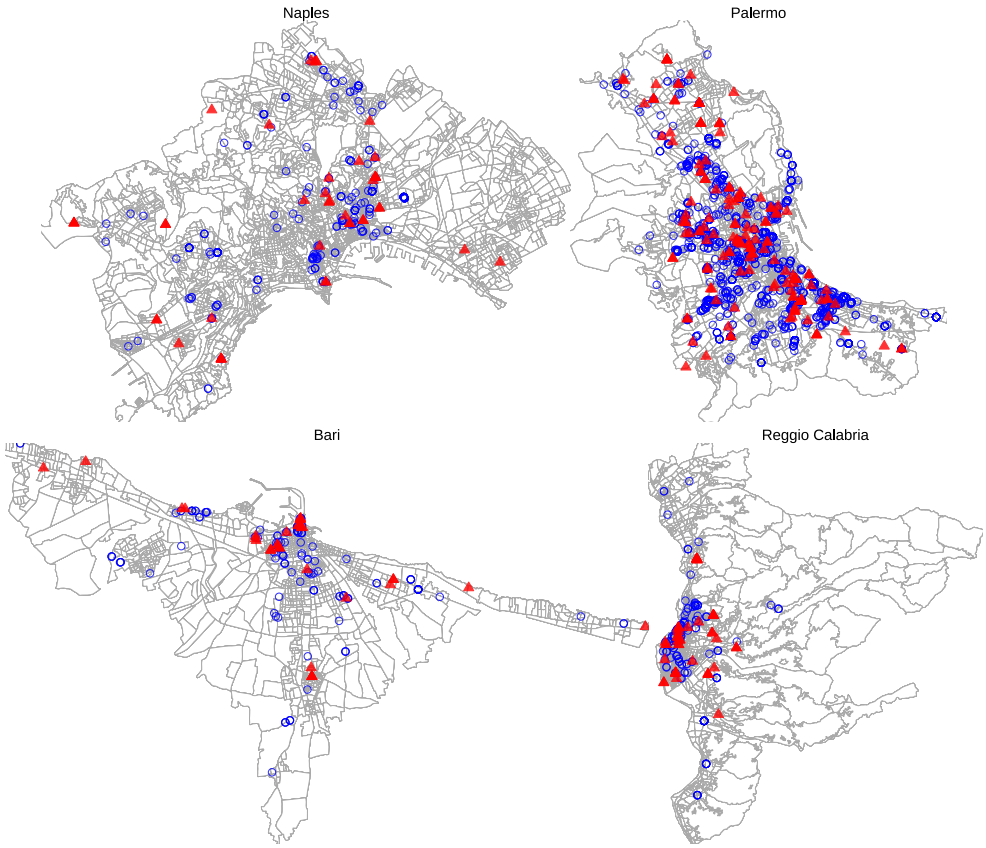
Moreover, I report below the measure of the dropout rate for students who leave education before turning 16. As explained in Section 4.4, I employ this measure to control

[27]Despite limitations from increased missing data that may affect treatment allocation, I employ this alternative specification solely for robustness testing in Section 6, where I examine treatment effects only in areas with unchanged boundaries to assess whether results are robust to measurement changes.

for pre-treatment trends in student migration, based on the assumption that students who disappear from enrollment registries before turning 16 are likely transferring to other schools rather than truly dropping out during compulsory education.[28]

$$Dropout(2th-3th)_t = \frac{Enrolled(1th-3th)_{t-1} - Enrolled(4th)_t - Enrolled(2th-3th)_t}{Enrolled(1th-3th)_{t-1}} \tag{6}$$

Figure A2 offers a visualisation of the presence of both reused and not yet or never reused Mafia properties in all the municipalities which are part of my sample.



[28]This measure mirrors the construction of the main outcome variable, capturing the share of students leaving school before enrolling in their third year of high school by following their cohorts. These are the only years where we can ensure that students following the standard educational timeline are consistently below age 16.

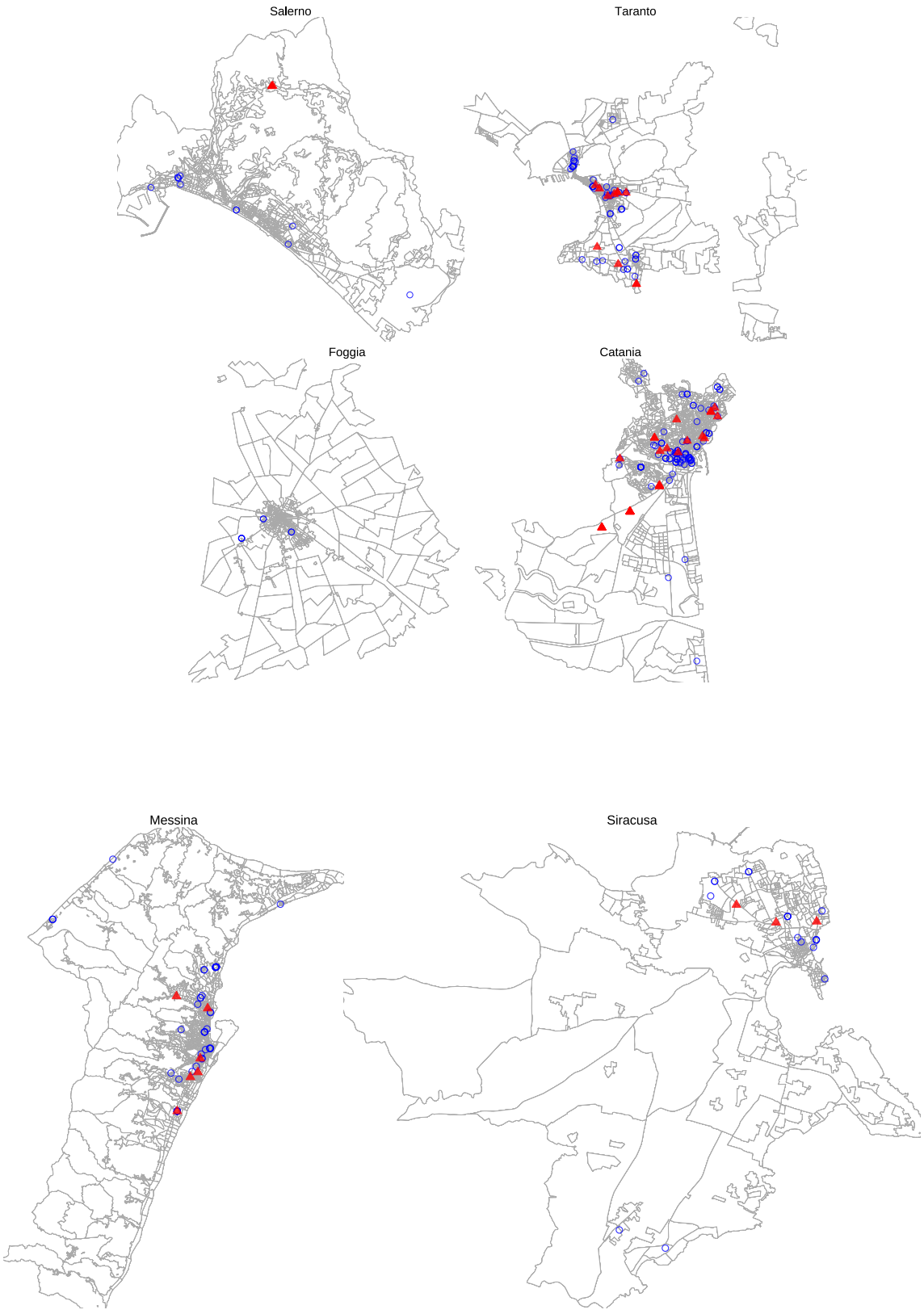


Figure 8 The distribution of Mafia real estate in the 10 metropolitan areas of the historical Mafia-ridden regions. Empty blue circles locate reallocated but not reused real estate, while red triangles indicate the real estate under reusing practices.

Finally, Table A1 explores the questions I employ in Section 7 from the *Survey on the Perception of the Mafia* (Torre, 2025).

Table 18 Survey Questions from the Survey of the Perception of the Mafia

ID	Question	Answer	Unit
V12	**What is the mafia for you?**	Open-ended text	Student
V28	**According to you, in your city, where young people are looking for work, what can they do?**		
	• Turn to a politician	Index 1-7	School
	• Turn to a politician (School level)	Index 1-7	School
	• Participate in a public competition	Index 1-7	School
	• Attend a professional training course	Index 1-7	School
	• Turn to a mafioso	Index 1-7	School
	• Turn to criminal groups	Index 1-7	School
V32	**In your opinion, who is stronger between the State and the Mafia?**		
	• The Mafia	Multiple choice	School
	• The State	Multiple choice	School
	• Equally	Multiple choice	School
	• I don't know	Multiple choice	School

8.2 Appendix B: Empirical Strategy

Understanding the determinants of Mafia property reuse is crucial for identifying potential sources of selection bias. Table 17 presents results for the cross-sectional correlation between the probability of reuse and local attributes. Municipality characteristics show that transparency and having a dissolution history are significant predictors of reuse. Local area attributes reveal that properties in areas with higher mafia presence, more NGOs, but lower rents are likely to be reused. Asset characteristics demonstrate that both the previous presence of reallocations and the years between confiscations and reuse matter. In Appendix C, I show that results hold for including school-level and municipality-level time trends and for the dynamic effect of changes in the presence of NGOs and rental prices.

Table 19 Regression results on reuse probability

	(1)	(2)	(3)	(4)
Baseline attributes		Pr(Reuse = 1)		
Had reallocations before = 1	0.466***			0.330**
	(0.117)			(0.127)
Had seizures before = 1	-0.0283			0.0528
	(0.0651)			(0.0497)
Years between confiscation and reuse	0.0286***			0.0164***
	(0.00622)			(0.00499)
Mafia = 1	0.126**			0.140***
	(0.0528)			(0.0504)
History of dissolution = 1		-0.168**		-0.366***
		(0.0776)		(0.0941)
Transparency = 1		0.339***		0.297***
		(0.0684)		(0.0739)
NGOs presence			0.000123	0.000647**
			(0.000293)	(0.000321)
Rental prices			-0.00307	-0.0366**
			(0.0168)	(0.0161)
Observations	252	256	241	240
clustered SE	yes	yes	yes	yes

Notes: Robust standard errors in parentheses. *, **, *** denote significance at 10%, 5%, and 1% levels respectively.

8.3 Appendix C: Additional Results and Robustness

8.3.1 Sensitivity to Omitted Variable Bias

In Appendix A, I discuss how I test the correlation between baseline characteristics and the probability of Mafia properties to get reused within schools' catchment areas. I find that Mafia properties are more likely to be reused in areas where there were previous reallocations, more years are passed from confiscation to reuse, and the areas are more deprived given lower rental prices and higher Mafia presence. At the municipality level, I find that reused Mafia properties are less likely to be located in municipality which have been dissolved for Mafia infiltrations in the past and less transparent municipality in sharing information about the Mafia properties available for potential reuse. These patterns suggest that underlying community dynamics and local housing conditions influence where reuse occurs. If these same factors also shape school outcomes, they could bias the estimated effects of reuse. For example, falling rents may signal worsening economic conditions that increase dropout risk leading to understimating the effect, while higher municipality trasparency could independently lead to decrease dropouts, overstimating the treatment effect. To investigate whether such slow-moving local dynamics confound the results, I estimate the effect of reusing Mafia properties on schools' dropout rates by accounting for schools-level and municipality-level time trends. This allows me to account for different trajectories in the dropout without absorbing it as a part of the treatment effect. Moreover, I control for non-linear dynamics in NGOs activity and rental prices. Local NGOs may appear suddenly when new funding becomes available, while rental markets may shift abruptly due to urban renovation policies. By incorporating lagged measures of NGO activity and rental conditions up to three years before treatment, I test whether these short-term fluctuations independently affect dropout trajectories.
The ceofficients remain remarkably similar across all seven specifications, indicating a consistent 1.5-2.1 percentage point decrease in dropout rates associated with school reuse. This magnitude represents a substantial effect suggesting reuse decreases dropout risk by roughly 25-35%. The robustness of this coefficient across different combinations of controls - including school and time fixed effects, municipality time trends, and various rent and NGO variables - demonstrates that this relationship is not driven by obvious confounding factors. While results are only significant in Columns 1 and and 5, the consistent magnitude suggests a genuine negative impact of school reuse on student retention. Across all specifications, reported p-values range from 0.04 to 0.28, indicating that while some estimates meet conventional significance thresholds, others are suggestive but not definitive. Moreover, the loss of significance in some models appears to be due to reduced precision rather than a disappearing effect, as evidenced by the relatively smaller sample sizes.

Table 20 Robustness exercise including time trends and additional controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dropout for the years from 3 to 5 (16-19yo)						
Reuse = 1	-0.0153**	-0.0151	-0.0211	-0.0201	-0.0159*	-0.0130	-0.0176
	(0.00762)	(0.0142)	(0.0134)	(0.0157)	(0.00861)	(0.00966)	(0.0121)
clustered SE	yes	yes	yes	yes	yes	yes	yes
school FE	yes	yes	yes	yes	yes	yes	yes
time FE	yes	yes	yes	yes	yes	yes	yes
migration	yes	yes	yes	yes	yes	yes	yes
retention	yes	yes	yes	yes	yes	yes	yes
school time trend	no	yes	yes	no	no	no	no
municipality time trend	no	no	no	yes	yes	yes	yes
NGOs t-1	no	yes	yes	yes	yes	yes	yes
rents t-1	no	yes	yes	yes	yes	yes	yes
NGOs t-2	no	no	yes	yes	no	yes	yes
rents t-2	no	no	yes	yes	no	yes	yes
NGOs t-3	no	no	no	yes	no	no	yes
rents t-3	no	no	no	yes	no	no	yes
Observations	1,403	1,398	1,121	856	1,398	1,121	856
Number of codscuolas	280	278	267	244	278	267	244
Mean dep. var.	0.0582	0.0579	0.0563	0.0537	0.0579	0.0563	0.0537

8.3.2 DiD Dynamic Model

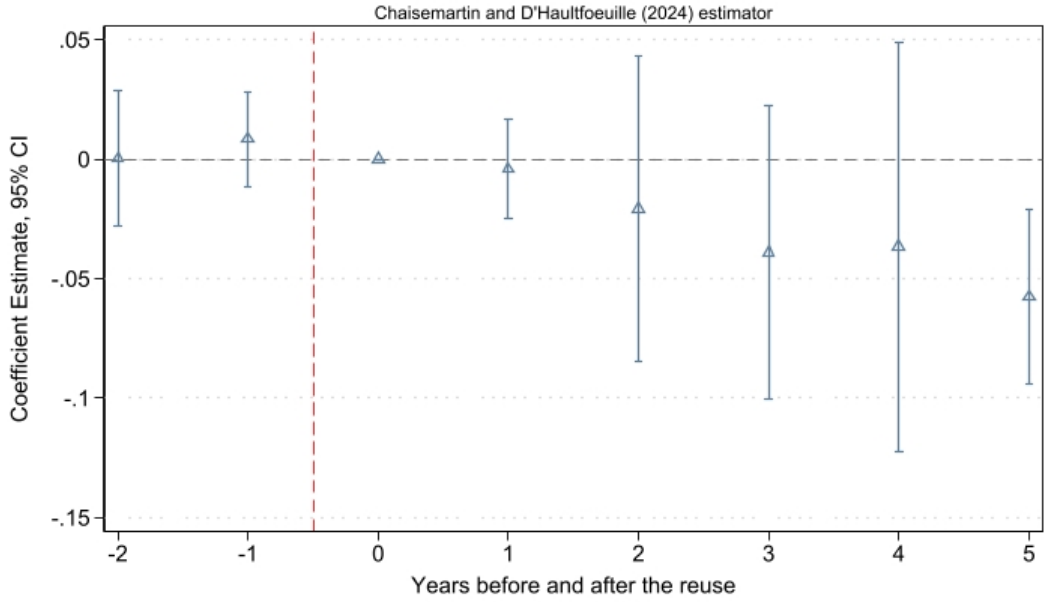


Figure 9 Event study using continuous exposure measure

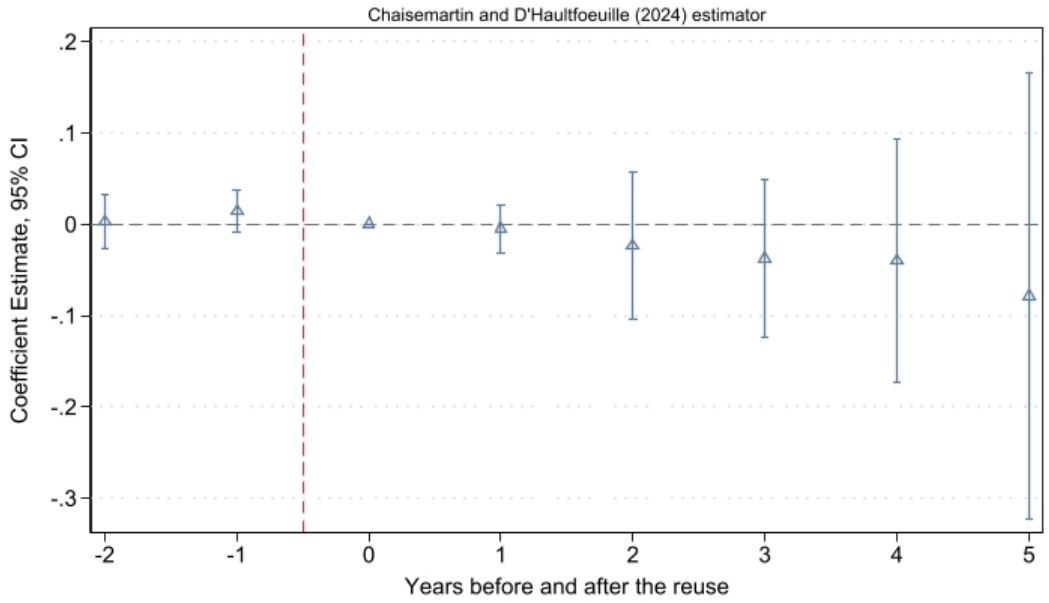


Figure 10 Event study using continuous exposure measure with 500 repetitions

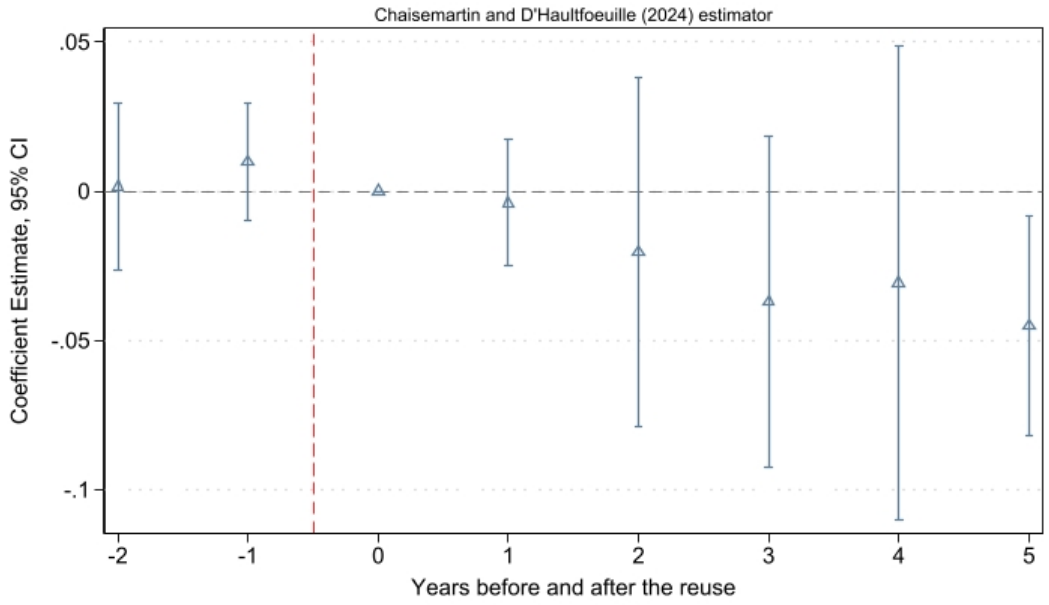


Figure 11 Event study using the count of reused assets weighted by the student population of school catchment areas

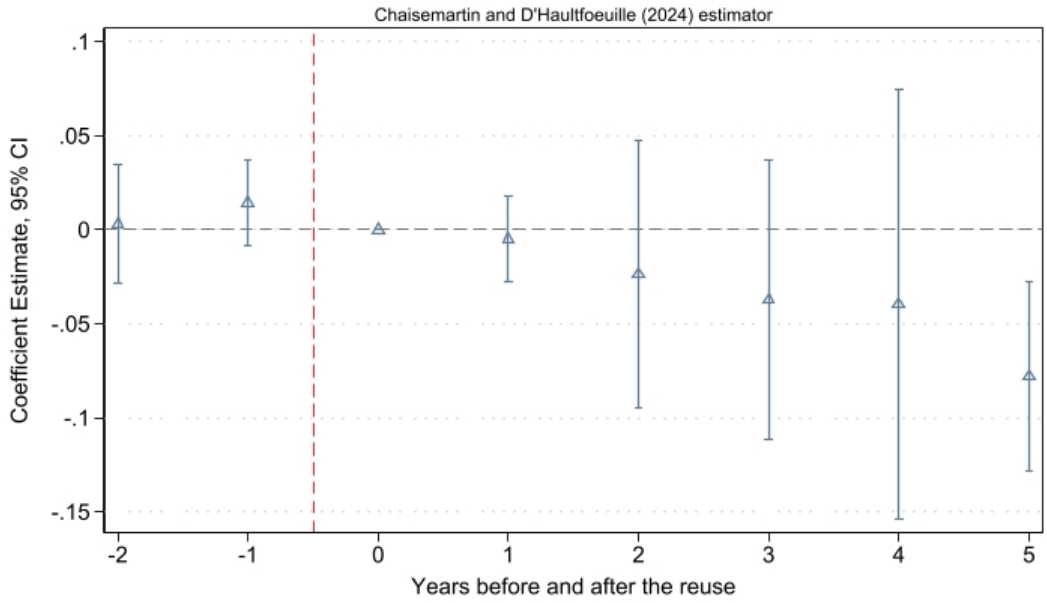


Figure 12 Event study using the count of reused assets weighted by the average distance of properties from the population-weighted centroids of schools' catchment areas

8.3.3 Mechanisms

Table 21 Impact of reusing Mafia real estate on students' perceptions of who is stronger between the Mafia and the State

	Who is stronger between the Mafia and the State?			
	(1)	(2)	(3)	(4)
	Mafia	State	Equally	Don't Know
Reuse = 1	-0.0312	0.0344	-0.00151	-0.00171
	(0.107)	(0.0812)	(0.0698)	(0.0454)
Observations	162	162	162	162
Number of schools	54	54	54	54
clustered SE	yes	yes	yes	yes
time FE	yes	yes	yes	yes
school FE	yes	yes	yes	yes
Mean dep. var.	0.394	0.170	0.296	0.139

Table 22 Top 25 terms for positive and negative sentiments

Panel A: top 25% negative words	**Anger**	**Disgust**	**Fear**	**Sadness**
	Electoral	Ruthless	Forced	Violence
	Laundering	Struggle	Eradicate	Kill
	Murder	Threathening	Hide	Cruel
	Resorting	Inconvenient	Manifests	Unfair
	Conflict	Involve	Struggle	Evil
Observations	638	393	327	274
Panel B: top 25% positive words	**Joy**	**Trust**	**Surprise**	**Anticipation**
	Money	Money	Money	Public
	Respect	Association	Violent	Respect
	Achieve	Structure	Protection	Protection
	Gain	Respect	Deal	Gain
	Freedom	Achieve	Hope	Poweful
Observations	227	569	740	234

Those words you listed are the most frequent words appearing in sentences that scored high (top 25%) for each specific emotion dummy.

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