When Integration Backfires: Examining the Effects of Inter-Municipal Cooperation on Local Housing Markets

Alessandro Sovera*

This Version: January 2025

Abstract

This study investigates whether benefits of larger local governments outweigh the inefficiencies from consolidation. Focusing on an Italian policy reform that mandated municipalities with populations under 5,000 to join inter-municipal communities (IMCs) for shared service provision, we assess its impact on local real estate prices. Our findings indicate a significant decrease in house prices in affected municipalities, suggesting a decline in the quality of the provision of public goods. In particular, we find no evidence supporting alternative mechanisms, such as changes in taxation or housing supply, that could explain these price dynamics. Ultimately, the results imply that joint management of municipal functions can be detrimental to both local governments and their residents, raising important questions about the effectiveness of such consolidation efforts. **JEL**: H70, H71, H72, R23, R31

*Tampere University and FIT. Email: alessandro.sovera@tuni.fi. I thank Anna Aizer, Ricardo Dahis, John Friedman, Peter Hull, Brian Knight, Emily Oster, Jon Roth, Emilie Sartre, and Matt Turner, and participants at seminars and conferences for valuable comments and suggestions. I thank Cristiano Durantini and Pasquale Recano for their help with obtaining the municipal balance sheets data, and Carmela Brugnano of IFEL to help with obtaining the property tax rate data. I also thank representative of "Unione della Bassa Romagna" for the help with understanding the functioning of Italian IMC. All remaining errors are my own.

1. Introduction

The optimal size of jurisdictions remains an important and debated topic within academic discourse, with significant implications for public administration and policy outcomes (Epple and Romer 1989; Ostrom et al. 1961; Ostrom 2010). Central to this discussion is the question of whether benefits of larger local governments outweigh the inefficiencies from consolidation.

Public choice theory and fiscal federalism stress the importance of decentralized management, advocating for the provision of public goods and services at the lowest possible governmental level that can effectively meet community needs (Oates 1972, 1999; Ostrom et al. 1961). This decentralized approach aims to leverage local knowledge and responsiveness while fostering accountability. However, excessive fragmentation of jurisdictions can produce inefficiencies, such as diminished economies of scale, increased transaction costs arising from coordination among multiple jurisdictions, and reduced competition. These inefficiencies can undermine the effectiveness of governance and the quality of public service delivery (Oates 1999; Tiebout 1956; Alesina and Spolaore 1997; Bolton and Roland 1997). Consequently, policymakers must critically evaluate jurisdictional configurations to balance improved public service delivery with economic vitality.

In recent years, many governments around the world have sought to integrate smaller jurisdictions through inter-municipal cooperation and mergers, driven largely by the need for cost savings and improved operational efficiency following the global financial crisis of 2008 (Bel and Warner 2015; Warner 2006). Despite these widespread reform efforts, the question of whether larger government entities are inherently more efficient in delivering public services remains unresolved.

This paper focuses on the Italian context, specifically examining a policy that man-

dates municipalities with fewer than 5,000 inhabitants (or 3,000 if located in mountainous areas) to share municipal functions. This initiative aims to reduce inefficiencies and achieve cost savings through an inter-municipal community framework. By encouraging collaboration among municipalities, the policy is designed to enhance service delivery and address logistical challenges while creating a more coherent administrative structure. Utilizing a comprehensive set of administrative datasets and a fuzzy difference-in-discontinuity design to account for compounded policy effects and significant non-compliance issues, I investigate the impact of aggregated municipal functions on the housing market.

The findings reveal that municipalities required to share functions experience noticeable decreases in both residential and commercial housing prices, declining by 5% and 13%, respectively. This outcome contrasts with the findings of (Tricaud 2025), who reported no significant change in house prices. The analysis indicates that the decline in housing prices is linked to a reduction in the quality of local public services, including essential services such as childcare, street lighting, libraries, local policing, and waste collection. The deterioration of these services often leads to increased outmigration from cooperating municipalities as residents seek better living conditions and amenities.

Moreover, my analysis finds no significant effects on property tax or waste tax rates, suggesting that the anticipated reduction in tax competition may not be as pronounced as in other contexts (Breuillé et al. 2018). Interestingly, unlike the findings reported by (Tricaud 2025), my study does not identify any significant changes in building permits or land use following the mandate for cooperation.

As highlighted by (Tricaud 2025), municipalities often show reluctance to engage in integration processes, even within inter-municipal cooperation frameworks. This resistance is evident in the Italian context, where the rate of non-compliance with the

inter-municipal cooperation mandate is notably high. To assess the external validity of my findings, I conduct a complier analysis following the methodology proposed by (Marbach and Hangartner 2020). This analysis reveals that compliant municipalities tend to be larger, more densely populated, more likely to be located in the North-West of the country, and less likely to be rural or mountainous.

The implications of my research suggest that the findings may be particularly relevant for larger urban municipalities, which are likely to experience substantial negative impacts due to the reduction in the quality of public services. This scenario can lead to a significant loss in the value of their housing stock. The challenges posed by these dynamics not only highlight the complexities of municipal cooperation but also present significant obstacles for policymakers who strive to enhance public service delivery and ensure efficient governance.

Ultimately, this research aims to provide valuable insights for policymakers, urban planners, and scholars by emphasizing the need for a thoughtful and informed approach to inter-municipal cooperation. While integration of smaller municipalities may offer potential benefits, it also carries risks that must be thoroughly examined. Understanding these complexities is essential for fostering effective governance and improving the quality of life for residents in both urban and rural areas. As I delve into the implications of this study, I hope to contribute to a more nuanced understanding of the optimal size of jurisdictions and the conditions under which municipal cooperation can be successful, ensuring that the intended benefits are realized and unintended consequences are mitigated.

1.1. Contribution to the literature

The literature on the consequences of jurisdiction size has long been debated. Advocates of decentralization, such as Tiebout (1956) and Oates (1972), argue that local public goods

provision better reflects population preferences than national provision. In contrast, Alesina and Spolaore (2005) and Bolton and Roland (1997) stress that the efficiency gains of larger jurisdictions must be weighed against the costs of increased heterogeneity and loss of local control. Overall, the optimal jurisdiction size aims to balance agglomeration and congestion effects, enhancing local governance efficiency (Brueckner 1981).

One illustration of this trade-off is the experience of local governments in consolidating through mergers or creating inter-municipal communities (IMCs). Studying municipal cooperation rather than mergers is advantageous because municipalities maintain their legal status, allowing for comparison between pre- and post-cooperation outcomes. Conversely, mergers involve the loss of identity for the municipalities, limiting analytical scope. Nonetheless, numerous studies focus on both the determinants and consequences of mergers in countries such as Germany, Israel, Denmark, and Sweden (Reingewertz 2012; Welling Hansen 2014; Blesse and Baskaran 2016; Harjunen et al. 2021).

A portion of the literature examines the factors influencing municipal integration, such as expected changes in fiscal revenues, proximity to public services, and neighbor characteristics (Saarimaa and Tukiainen 2015; Bel and Warner 2015; Di Porto and Paty 2018; Bergholz and Bischoff 2018). Another segment assesses the aggregate consequences of integration regarding efficiency gains. Meta-analysis by Bel and Sebő (2021) reveals mixed findings. Studies suggest savings from economies of scale in places like Israel and Germany, particularly for compulsory mergers (Reingewertz 2012; Blesse and Baskaran 2016). In contrast, limited effects have been noted in France, the Netherlands, Italy, and Finland due to compensatory dynamics within each country (Frère et al. 2014; Blom-Hansen et al. 2016; Allers and de Greef 2018; Luca and Modrego 2021)[1] The benefits

[1]In contrast, Ferraresi et al. (2018) indicate that IMCs lead to decreased public expenditures in Italy's Emilia Romagna region.

of agglomeration appear contingent on public service cost structures, local governance configurations, and the overarching governance framework (Bel and Warner 2015). Recent studies have also focused on revenue aspects, particularly in France (Charlot et al. 2015; Breuillé et al. 2018; Agrawal et al. 2024). Furthermore, other research indicates that inter-municipal cooperation correlates with local growth determinants, such as unemployment (Banaszewska et al. 2022), public sector jobs (Harjunen et al. 2021), business development (Wolfschütz 2020), and night-light intensity (Egger and Koethenbuerger 2010; Pickering et al. 2020).

A recent study by Tricaud (2025) closely relates to my work. It investigates the impact of IMCs in France on building permit supply and house prices, alongside various other outcomes. Tricaud finds that high-demand urban municipalities see an increase in building permits, while rural municipalities experience a decline in public services. Notably, these effects are observed only for municipalities that were compelled to integrate. My work corroborates the view that forcing local policies, such as IMCs, may not yield beneficial outcomes. However, my findings differ: while municipalities forced to cooperate do not experience changes in housing supply, they face decreased house prices attributed to a decline in the quality of local public goods.

Additionally, I explore these dynamics within a high non-compliance environment, where policy mandates often lack stringent enforcement. This context allows me to make one of the first applied contributions using fuzzy difference-in-discontinuity design (Galindo-Silva et al. 2021; Millán-Quijano 2020; Picchetti et al. 2024) to account for non-compliance and conduct a comprehensive complier analysis (Marbach and Hangartner 2020), which is crucial for policy evaluation amid high non-compliance.

Finally, this paper represents one of the first country-wide studies on IMCs in Italy, offering valuable insights into local governance dynamics. Italy serves as an important case study for the impactsof local policies due to its strong decentralization, which

characterizes its governmental system and public goods provision (Bianchi et al. 2022). Thus, providing detailed results complements the recent literature that studies local governments using robust and precise econometric methods.

The remainder of the paper is organized as follows: Section 2 outlines the Italian framework and the evolution of IMC legislation; Section 3 discusses the data sources and sample characteristics; Section 4 details the identification strategy and examines preliminary checks of its assumptions; Section 5 presents the main results by outcome category; Section 6 assesses the mechanisms underlying the findings; and Section 7 concludes.

2. Background

Italy's administrative structure consists of three layers: Regions, Provinces, and Municipalities, the latter being the lowest level of governance. The country has inherited a fragmented administrative framework from its pre-unitary past, with a total of 7,954 municipalities as of 2018. Many municipalities are small, with median and mean populations of 2,522 and 7,694 inhabitants, respectively. Municipalities serve as the closest authority to citizens, responsible for various public functions, including social welfare services, territorial development, local transport, education, cultural facilities, police services, water delivery, waste disposal, and infrastructure spending. This fragmentation has led Italian lawmakers to increasingly promote municipal cooperation, drawing on theories of functional federalism to enhance the efficiency of local governance (Ermini and Fiorillo 2009).

Inter-municipal communities (IMC), known in Italy as *Unioni di Comuni*, were established three decades ago through Law 142/1990. This framework allows municipalities to transfer specific decision-making powers and financial resources to a newly created ad-

ministrative entity that provides agreed-upon services. Each IMC acts as a legal entity. It has a President who is elected by the Council and serves a one-year term, rotating among mayors. The Council consists of the mayors of member municipalities and counselors elected based on population, ensuring representation for minority municipalities. The President can appoint an Executive Board to support her mandate. Each IMC produces its own balance sheet. Notably, Italian law stipulates that each municipality can belong to only one union, although they can change unions based on their statutes.

The development of IMC has occurred in three phases. Initially, they were designed for small municipalities with populations below 5,000, with a temporary goal of encouraging full merging within a decade. However, limited economic incentives led to minimal interest from local administrators, with only 16 communities formed by 1999 (Ivaldi et al. 2016). Law 265/1999 eliminated the temporary nature and population size limits of these bodies, but enthusiasm for unions remained low. In 2010, the Italian government mandated municipalities with populations below 5,000 (or 3,000 in mountainous areas) to deliver public services through inter-municipal communities. This mandate established shared management of at least six essential functions, aiming to improve public service delivery and efficiency, particularly in the post-2008 recession context (Crescenzi et al. 2016). Municipalities below specified population thresholds were required to jointly manage a minimum of three "fundamental functions" by January 1, 2013; additional functions by September 30, 2014; and all remaining functions by December 31, 2014[2]. Commonly transferred "fundamental functions" include financial management, public transport services, land registry, urban planning, civil protection, waste collection, social services, school infrastructure, and local police functions. Other

[2]Despite the initial mandatory management mandate, deadlines for implementation have been extended multiple times, most recently to December 31, 2022, through decree law 228/2021. The Italian Constitutional Court intervened in 2019, asserting that the obligation to join unions cannot be absolute and must allow exemptions in cases where financial and efficiency benefits are unproven.

functions, such as economic development and tourism, can also be transferred to improve municipal management, exemplified by coordinated municipal policing through the IMC.

Financially, the role of inter-municipal communities within local government budgets has grown. For instance, in 2007, municipal unions accounted for approximately 0.10% of total local expenditures in Italy, increasing to around 0.30% by 2013 (Ferraresi et al. 2018). This percentage likely underestimates actual expenditures, as municipalities often do not aggregate allocated functions in expenditure reports. Inter-municipal communities receive financial support through transfers from member municipalities and other governmental levels. They also benefit from exemptions to fiscal regulations impacting larger municipalities. While there is debate over the regulatory power of inter-municipal communities (IMC) in taxation matters, evidence suggests that many IMCs have indeed acquired regulatory authority, allowing them to not only assess taxes but also manage collections and exercise regulatory power as recognized local entities. This regulatory capacity enables IMCs to be funded through a share of the taxes they collect and transfers from member municipalities, regions, and the State.

Figure 2 illustrates the establishment of IMC across Italian Ordinary Status regions by year of foundation. As previously noted, there were very few municipal unions prior to the year 2000. A significant change in legislation at that time led to increased popularity and formation of these unions. Despite the introduction of policies in 2010 intended to promote municipal union formation, the anticipated surge did not materialize until 2014, when the rules governing their establishment were simplified. By 2018, the final year of analysis, there were 445 active municipal unions encompassing a total of 2,369 municipalities, representing approximately 35% of all municipalities in Ordinary Status regions.

Figure 3 depicts the geographical distribution of IMC in Italy, highlighting their

characteristics and locations. Notably, many municipal unions are situated in mountainous and hilly areas, primarily due to the smaller size of towns in these regions. Additionally, the dissolution of the so-called *Comunita' Montane* (Mountain Communities) into municipal unions further contributed to this geographic pattern. It is also evident that these unions typically consist of neighboring municipalities that share a common territory and historical background, fostering collaborative objectives and initiatives. Composed primarily of neighboring municipalities within the same commuting zone, IMC are widespread across the country, with a higher concentration in Northern regions, particularly Lombardy and Piedmont, and in smaller or more remote localities, such as the mountainous areas of the Alps and Apennines. The demographic characteristics show an average municipality size of roughly 4,000 inhabitants, indicating that inter-municipal cooperation mainly attracts smaller municipalities.

Lastly, Table 1 provides a geographic breakdown of IMC by region, along with several key characteristics. When paired with Table 2, it reveals that the average population of an IMC is less than 5,000 inhabitants, with most unions being established around 2009 and typically comprising five municipalities. The data indicates that IMC are predominantly located in northern Italy, with the top four regions in terms of the number of IMC accounting for roughly 50% of the total.

3. Data

This section outlines the datasets utilized for analysis, covering expenditures, revenues from Italian municipalities, information on inter-municipal communities, population demographics, measures of public goods quality, house prices, and various municipal characteristics. The data, collected from reputable sources such as the Italian Ministry of Internal Affairs and the Italian National Statistical Institute, spans multiple years

and provides an extensive view of the financial, demographic, and service provision landscape across Italian municipalities. Through careful integration and filtering, the final dataset comprises 6,188 municipalities observed from 2002 to 2018, enabling a robust examination of the effects of inter-municipal cooperation on service delivery and fiscal outcomes.

Unioni di Comuni. Data on all inter-municipal communities that exist in Italy in 2018. The dataset comprises information on 559 IMC, detailing their member municipalities and respective years of creation and termination, compiled from the Italian Ministry of Internal Affairs and supplemented by regional registries, local newspaper articles, and other local government resources (e.g., IFEL). This allows for a comprehensive analysis of historical municipal unions.

Population. Population counts were gathered from the 2001 and 2011 Censuses, alongside intercensal population data from 2000 to 2020. This data assists in identifying municipalities subject to the 2010 mandate. Very few municipalities switched between being below and above 5,000 inhabitants during the 2001-2011 period; hence, the 2001 Census was used for years 2000 to 2009 and the 2011 Census for 2010 onwards. Additionally, net immigration data (inflows minus outflows) and birth counts were collected from the Italian National Statistical Institute.

House Prices. For house prices, comprehensive administrative data on real estate prices and rents were collected and harmonized by the Italian Treasury. This dataset, gathered by the *Agenzia delle Entrate - Territorio - Osservatorio del Mercato Immobiliare*, covers the period from 2002 to 2018, featuring both residential and non-residential units. It includes information on sale prices and rents, collected separately for residential housing, industrial real estate (factories, industrial buildings, and craft workshops), and offices. Following Fenizia and Saggio (2024), real estate prices/rents are computed at the municipality level as the average selling price/rent in municipality m in year

t, excluding outlier transactions and retaining only properties reported as having a "normal" condition.

Public Goods. Measures of childcare, street lighting, local police and trash collection are collected from the municipalities balance sheets and OpenCivitas dataset. The measures are defined as the percentage of satisfied childcare demand (satisfied demand/total demand), illuminated km of public streets/total km of public streets, number of local police officers per 1000 inhabitants, and houses served by trash collection/total number of houses. In addition, information on public libraries in Italy (approximately 15,000) was acquired from the Italian Registry of Libraries, detailing their dates of opening/closure, locations, and additional characteristics. The measure for libraries is number of libraries per 1000 inhabitants.

Expenditure and Revenues. Detailed balance sheet data for all Italian municipalities (over 8,000) for the years 1998-2018 were obtained from the Italian Ministry of Internal Affairs. These data include detailed categorizations of municipal expenditures and revenues. Expenditures are divided into current and capital categories and further classified into twelve functions: administration, management and control, justice, local police, education, culture, sport, tourism, transportation, environment, welfare, and trade. Revenues encompass various sources, including taxes, transfers, loans, sales, and third-party revenues, focusing primarily on current and capital expenditures. Monetary values are expressed in real terms (2015 euros) and on a per capita basis.

Housing supply. There is no available data on housing permits for Italian municipalities but other work has been using the housing permit revenues as proxy for it, under the assumption that the price of housing permits has not changed significantly over time and that the enforcement level was also unchanged. To corroborate this measure, I pair it with a measure of percentage of used land as collected by ISPRA, which measures the percentage of land used by municipality over time.

Municipal Characteristics. Data concerning various municipal characteristics were sourced from the Italian Statistical Institute and include mostly geographical information about area, altitude, island or coastal municipality, and rural status.

After merging all data sources and filtering out municipalities in Special Status regions (due to different expenditure management rules and fiscal constraints) and those that did not exist for the entire analysis period (including those that merged into new municipalities or were otherwise suppressed), the final sample consists of 6,742 municipalities spanning the years 2002 to 2018, yielding a total of 121,326 observations.

Table 2 shows summary statistics for the two groups of municipalities of interest, those with population below the threshold and mandated to join a municipal union, and those with population above it. All the variables are measured in the pre-reform period as an average between 2000-2009. The purpose of this table is to compare municipalities before the mandate was implemented to see if they were at all different a priori.

Panel A reflects significant differences in the real estate market between the two groups. The average residential sale price in treated municipalities is €859.16, compared to €1,179.67 in untreated municipalities. This indicates that treated areas experience substantially lower residential property values. A similar trend is evident in the rental market, where the average residential rent price is €2.97 for treated municipalities, while untreated areas report an average of €4.15. In the commercial sector, the average commercial sale price for treated municipalities is €607.99, markedly lower than the €842.80 for untreated municipalities. The average commercial rent price also mirrors this trend, with treated municipalities showing an average of €2.85 compared to €4.02 in untreated areas. These findings highlight the disparities in property values and rental prices, suggesting that smaller municipalities may have less robust real estate markets.

Panel B examines various factors that may mediate the relationship between municipality size and public service delivery. The main dwelling tax rate is slightly higher in

treated municipalities (0.48) compared to untreated ones (0.45). In contrast, the base building tax rate is slightly lower for treated municipalities (0.60) relative to untreated municipalities (0.63). Population figures reveal dramatic differences, with the average population of treated municipalities being 1,549.34 compared to a substantial average of 19,890.09 in untreated areas. Other indicators of public service provision, such as net immigration, childcare availability, street lights, local police presence, and library services, show lower averages in treated municipalities compared to their untreated counterparts. For instance, treated municipalities report only 7.08 net immigrants versus 105.33 in untreated areas, and they provide an average of 2.23 street lights compared to 1.51 in untreated municipalities. These results suggest that smaller municipalities may struggle to maintain similar levels of public services and amenities as their larger counterparts.

Panel C includes several geographic and demographic factors that further contextualize the differences between treated and untreated municipalities. Treated areas have an average area of 27.35 km^2, while untreated municipalities average 57.52 km^2. Population density displays a stark contrast, with treated municipalities averaging 128.20 compared to untreated municipalities' 604.44. The elevation data shows that treated municipalities are situated at an average altitude of 419.51 meters versus 231.60 meters for untreated ones, indicating that geographical factors might also play a role in the differences observed. Finally, the regional distribution shows that a majority of treated municipalities are rural (85%), whereas untreated municipalities reflect a more mixed distribution across regions, with higher urban concentration.

4. Methodology

The IMC mandate, which has been in effect since 2010, introduces a sharp cutoff at a population size of 5,000 inhabitants[3]. However, this is not the only policy that varies based on population size; it coincides with a significant increase in the wages of mayors and other members of the executive committee, as defined by a remuneration policy established in the early 1960s. Research by Gagliarducci and Nannicini (2013) indicates that this wage increase at the 5,000-inhabitant threshold attracts more educated individuals to political roles and leads to improved performance among elected officials. Furthermore, after 2001, municipalities with populations below 5,000 were exempted from the Domestic Stability Pact—a set of fiscal rules imposed by the central government aimed at regulating local financial management. As noted by Grembi et al. (2016), these constraints alter the spending behavior of affected municipalities, making it a relevant confounder in assessing the effects of the IMC mandate.

Given the institutional framework outlined above, three key treatments change at the 5,000-inhabitant threshold: the salary of the mayor and executive officers, fiscal rules, and the mandate for municipal unions. Municipalities below this threshold not only have lower mayoral salaries throughout the sample period, but they also enjoy greater spending flexibility. In contrast, the municipal union mandate was introduced in 2010 for those municipalities. Consequently, using a cross-sectional regression discontinuity (RD) estimator would yield a biased estimate of the average treatment effect (ATE) of the mandate, as the effects of these three confounding treatments become entangled.

To address this multiple policy issue, I employ a fuzzy Difference-in-Discontinuity identification strategy, following the approaches of Galindo-Silva et al. (2021) and Millán-Quijano (2020). This method intuitively leverages pre-period data to control for any

[3]The following discussion focuses on the 5,000 inhabitant threshold but can be extended to the inclusion of the second threshold around 3,000 inhabitants for mountaineous municipalties.

existing differences in outcomes at the cutoff, allowing for the identification of the treatment effect of interest by isolating the impacts of concurrent policies at the same threshold. The identification of the ATE assumes that: 1) the conditional expectation of all potential outcomes is continuous at the cutoff; 2) the determination of whether an individual is subject to the treatment is independent of potential outcomes near the cutoff, meaning individuals cannot self-select into the treatment; 3) the confounding policy maintains the same effect before and after the treatment; and 4) the probability of selection into each policy and the joint probability of selection remain constant. If these five assumptions hold, the fuzzy Difference-in-Discontinuities estimator can accurately identify the local causal effect of the treatment of interest. For a comprehensive discussion of these assumptions and their econometric treatment, see Galindo-Silva et al. (2021).

Estimation can be performed non-parametrically by selecting a smoothing parameter. I adopt the bandwidth selection method proposed by Picchetti et al. (2024), which minimizes the Mean Square Error (MSE) of the estimator, similar to the recommendations of Calonico et al. (2014) for simple regression discontinuity designs. Additionally, I calculate robust confidence intervals that demonstrate superior properties compared to the bias-corrected intervals suggested by Calonico et al. (2014).

Figure 4 presents the yearly RD estimates for the likelihood of being part of an inter-municipal community surrounding the 5,000-inhabitant cutoff. The two red lines mark 2010—the year the policy was implemented—and 2014—when a set of incentives was introduced to encourage municipal participation. Subfigures a) and b) display the RD estimates for the year before the reform (2008) and a year after (2015). Notably, there is no significant effect of being a municipality with fewer than 5,000 inhabitants on the likelihood of joining an IMC prior to the reform. However, the estimate becomes positive and statistically significant after the policy was enacted, although the increase in

probability is modest. Subfigure c) illustrates the evolution of yearly RD estimates over time alongside their 95% confidence intervals. The main takeaways from this analysis are: first, prior to 2010, RD estimates are insignificant and close to zero, indicating that municipalities formed unions irrespective of their population size. Second, even after the policy's implementation in 2010, not all municipalities that were expected to join did so, with only a 30% increase observed by 2018 in the likelihood of municipalities with fewer than 5,000 inhabitants belonging to an IMC. This can be attributed to the gradual enforcement of the mandate and the persistent parochialism among municipalities, as well as local politicians' concerns about potential electoral repercussions from supporting municipal unions, especially in smaller towns.

Lastly, the policy's effect became statistically significant in 2014, coinciding with the introduction of additional incentives and simplifications aimed at facilitating the creation of unions. It is important to note that 2010 should not be considered the definitive start of the post-reform period, as municipalities were granted a three-year window to delegate their functions to the newly established entities. Therefore, since this study focuses on the impact of cooperation on public good quality, it is more appropriate to define the post-period as commencing in 2013, when shared functions began to be officially implemented (Bellodi et al. 2022).

Thus, I define the post-period starting in 2013 and compare municipalities both above and below the 5,000-inhabitant threshold, before and after this year. The primary specification utilizes a first-order polynomial with a robust estimation procedure. As a robustness check, I will estimate the same model using higher-order polynomials (second and third), different bandwidths, and various estimation techniques in the Appendix. Formally, I estimate the following model, in line with the methodologies outlined by Galindo-Silva et al. (2021) and Miller et al. (2023):

$$Y_{mt} = \alpha_1 + \alpha_2 Treat_m + \alpha_3 Post_t + \tau Treat_m * Post_t + f(X_{mt}, Post_t) + \varepsilon_{mt}$$

and $Treat_m = \tau_0 + \tau_1 I(Pop_m < 0) + \tau_2 Post_t + \tau_3 I(Pop_m < 0) * Post_t + f(X_{mt}, Post_t) + u_{mt}$, where Pop_m is 2010 population of municipality m recentered around zero, $I(Pop_m < 0)$ is an indicator function that equals one if 2010 population is below zero (less than 3,000 for mountainous municipalities and less than 5,000 for other municipalities), $Post_t$ is a binary variable that equals one for the years 2013 and onward, and $f(X_{mt}, Post_t)$ is a polynomial function of the running variable that includes interactions with $I()$. Since the design is fuzzy rather than sharp, the participation in inter-municipal communities (IMC) is only partially determined by crossing the population cutoff. Some municipalities opted to form IMC prior to the mandate's implementation, while others resisted compliance even after the mandate was enforced. The estimator τ^{FRD} is the fuzzy difference-in-discontinuities estimator, obtained through a two-stage least squares estimation.

5. The effect of IMC on house prices

The principal findings are summarized in Table 3, which analyzes the impact of joining an inter-municipal community (IMC) on sale and rent prices for two categories of properties: residential and industrial. In the economic literature, variations in house prices are frequently interpreted as indicators of changes in the quality of public services; amenities such as educational institutions, parks, and shopping centers typically enhance property values, whereas disamenities such as noise and pollution detract from them (Fishel 2001). Accordingly, homebuyers and tenants are often inclined to incur higher costs for properties located in areas that provide superior public services and

overall living conditions.

A limitation of the house price data lies in the absence of detailed property characteristics, such as the number of rooms and square footage. However, the dataset categorizes buildings into three distinct conservation states (poor, average, optimal), which facilitates the aggregation of properties with similar attributes. This approach to measuring house prices has been employed and substantiated by prior literature, thus providing a reliable framework for assessing the effects in question (Fenizia and Saggio 2024; Accetturo et al. 2021; Zurla 2023).

To illustrate the observed impacts, I commence with plots of the yearly reduced-form estimates for sale and rent prices across both property categories. Figures 5 depict the estimates for residential sale and rent prices. Notably, there is a significant downward shift in the trend for residential prices following the implementation of the IMC policy in 2010. Prior to this intervention, a relatively stable pre-trend persisted until 2009, indicating consistent price levels; however, a pronounced negative change is evident after the policy took effect. This trend is similarly reflected in plots c) and d), which illustrate industrial prices, where a comparable flat pre-trend transitions into a significant decline subsequent to 2010. Collectively, these initial findings suggest that municipalities integrating into an IMC experience adverse effects on both residential and commercial property prices.

These results are further corroborated by the estimates presented in Table 3. Columns (1) and (2) reveal a statistically significant effect on sale and rent prices for residential properties across all specifications. The coefficients are negative and robustly significant, with a decrease in sale prices ranging from 4% to 4.3%, and a decline in rent prices between 6% and 6.2%. In Columns (3) and (4), a more pronounced reduction in commercial property sale prices is evident, exhibiting a decrease of 11.5% to 13.1% relative to the mean, accompanied by a notable 15% to 18% reduction in rent prices. The estimates

closely align when employing the robust and bias-corrected estimation procedure developed by Calonico et al. (2014). Importantly, all specifications demonstrate a strong first stage, as indicated by a high F-statistic value. The findings are consistent across various bandwidth specifications, as demonstrated in Figure A2 and across polynomial specifications (Table A3)[4].

These findings have significant implications regarding the effects of municipal cooperation facilitated through IMC. The observed decline in property values suggests that the anticipated benefits associated with improved public services and amenities may not be realized for residents and businesses following the formation of an IMC. This raises critical questions about the effectiveness of such cooperative arrangements in enhancing local governance and service quality. Notably, these results align with existing literature, which indicates that inter-municipal cooperation does not always translate into expected improvements in public service delivery.

5.1. Validity tests

The identification strategy employed in this analysis utilizes a fuzzy regression discontinuity design applied to first differences. This approach necessitates adherence to specific assumptions related to both instrumental variable methodology and the difference-in-discontinuity framework. The validity of the first stage is evaluated by calculating the F-statistic across all specifications, ensuring the instruments used are sufficiently strong. Additionally, the parallel trends assumption is assessed by plotting the reduced-form estimates over time for each specification.

To verify the assumptions for the difference-in-discontinuity design, I first examine the continuity of the running variable—specifically, the population count—following the guidance of McCrary (2008). Figure A1 illustrates that the Census-derived popula-

[4]The same results stand when using non-tranformed prices as in Table A2.

tion figures from 2001 and 2011 exhibit a smooth distribution at the cutoff, supporting the continuity assumption. The census is conducted independently by the National Statistical Office, ruling out the possibility of false reporting.

Subsequently, I conduct balance tests on the characteristics of municipalities around the cutoff to ensure a smooth distribution across this threshold. Table A1 provides descriptive statistics for key demographic and economic variables, confirming the absence of discontinuities or manipulations that could bias the results. Furthermore, Table A4 demonstrates that the point estimates remain consistent with the inclusion of municipal controls, emphasizing that covariates do not influence the estimates. Following Grembi et al. (2016), I focus on geographical characteristics of the municipalities, acknowledging that Italian geography correlates with economic development, crime rates, and factors related to opportunistic manipulation.

Next, I examine the sensitivity of the estimates to bandwidth choices, as illustrated in online Appendix Figures A2, A3, A4, A5, A6, and A7. I select bandwidths in increments of 50 inhabitants surrounding the optimal bandwidth calculated using Calonico et al. (2014). The estimates display robustness, remaining consistent within a range close to the value obtained from the optimal bandwidth.

Inspired by Della Vigna and La Ferrara (2010), I perform difference-in-discontinuity estimations for house price outcomes using false population thresholds around the true cutoff of 5,000. These false thresholds extend from 3,900 to 4,900 and 5,100 to 6,100, ensuring sufficient distance from the actual policy threshold. For mountainous municipalities, thresholds from 1,900 to 2,900 and 3,100 to 4,100 are employed. At these fabricated points, we do not expect to observe systematic treatment effects similar to our baseline findings.

Figure A8 displays the cumulative density functions for residential and commercial building prices based on 2,000 placebo estimates. This analysis employs a third-order

spline polynomial specification. The premise is that we should not see many coefficients outside the actual threshold's range. Indeed, all placebo coefficients fall below the estimated values for both residential and commercial properties, with the cumulative density functions steeply clustered around zero. Notably, only 3 percent of the placebo coefficients for residential prices and 5.5 percent for commercial prices exceed the absolute value of the true coefficient and show opposite (negative) signs compared to the true baseline estimate. Overall, these placebo tests strongly reinforce the robustness of our main findings related to fiscal discipline.

In conclusion, this rigorous assessment of continuity and smooth distributions validates the identification strategy utilized in this study. By ensuring that necessary assumptions are satisfied, the analysis provides a robust framework for examining the relationship between inter-municipal cooperation and local outcomes. Maintaining the design's integrity further strengthens confidence in the policy implications drawn from the findings. Future research should explore these relationships further, particularly by incorporating additional variables that may influence the effectiveness of inter-municipal cooperation in enhancing local governance and public service delivery.

6. Mechanism

The main result indicates that municipalities joining an inter-municipal community (IMC) experience a decrease in house prices in both the residential and commercial sectors. Several factors may contribute to this finding. On the demand side, changes in property tax rates could directly impact housing affordability and influence buyers' purchasing power. Additionally, variations in the quality of local public goods—such as education, public safety, and infrastructure—might affect residents' quality of life and, consequently, the desirability of housing. Research by Tricaud (2025) further suggests

that supply-side factors may also play a role, particularly regarding changes in the issuance of housing construction permits, to which I add land supply measures.

6.1. Property taxes

To examine demand-side factors, I begin by analyzing the property tax policies and rate-setting behavior of municipalities that participate in inter-municipal communities. Although existing literature on the impact of IMC on local taxation is limited, it offers valuable insights. For instance, Breuillé et al. (2018) identifies a correlation between inter-municipal cooperation in France and increased taxation, as reduced competition enables municipalities to avoid undercutting one another. However, various dynamics are also at play; a principal motivation for endorsing IMC is their potential to yield economies of scale, possibly leading to lower public expenditures and, consequently, reduced taxation (Duncombe and Yinger 1993). Thus, the relationship between IMC and taxation remains ambiguous, warranting further investigation in this section. Additionally, substantial literature highlights the negative relationship between property tax rates and house prices (Oates 1969; Elinder and Persson 2017; Oliviero et al. 2019). Collectively, these factors position property taxes as a plausible channel through which joint management of municipal functions may affect the housing market.

Property tax is the primary source of revenue for local governments in Italy. In 2015, property tax revenues accounted for 18% of total municipal revenue and 42% of total tax revenue for the average municipality[5]. Mayors have the power to adjust tax rates within the limits established by the central government, making the property tax a critical instrument for managing local taxation and revenues[6]. Although the structure of the property tax has evolved throughout the analysis period, these changes have uniformly

[5]Ministry of Finance, 2015

[6]The standard tax rate for primary residences is 0.4%, while it is 0.76% for all other buildings. Mayors can adjust this rate by up to 0.2% for primary residences and 0.3% for other buildings.

impacted all municipalities, ensuring that they do not skew the results[7].

Figure 6 presents the yearly reduced-form estimates for the period from 2002 to 2018. Subfigures a) and b) display the estimates for the main dwelling and base building tax rates, respectively. There is no evidence of any significant change in these rates following the implementation of the 2010 mandate, nor is there a noticeable change after 2014 when joint function management became mandatory. In both cases, a stable pre-trend is observed, but no clear alteration occurs post-policy implementation, suggesting that the average difference between the pre- and post-periods is likely not statistically significant. Robustness checks reveal that the results hold under different bandwidth specifications, as shown in Figure A2.

The trends observed in the graphical analysis are corroborated by the estimates presented in Table 4, which detail the effects of inter-municipal cooperation on property tax rates. The results indicate no statistically significant effect on the tax rate for either primary residences or other types of buildings. Notably, the coefficients display opposing signs—positive for the primary dwelling rate and negative for the rate applied to other properties—but lack significance across all specifications. This finding implies that the joint management of municipal functions does not meaningfully influence the tax-setting behavior of participating municipalities. This may be attributed to the nature of the IMC, which does not directly collect revenues but rather receives transfers from member municipalities based on their populations. Therefore, while cooperation may diminish competitive pressures, it does not extend to tax-setting dynamics, as the IMC is not directly influenced by these competitive interactions.

[7]The principal change involved expanding the range for adjusting tax rates, thereby granting mayors greater discretion in rate-setting (Shi and Tulli 2020)

6.2. Public good quality

The next mechanism to consider involves changes in the quality of local public goods. Since 2001, municipalities have been granted greater autonomy in managing local public goods, reflecting a broader decentralization of powers from the State. For instance, municipalities can manage local welfare policies, childcare and school buildings, local police, urban planning, etc.

In this section, I focus on a specific set of public goods commonly studied in the literature that are also pertinent to the Italian context. I compute measures of demand satisfaction for public services as the ratio between satisfied applications to total applications submitted for childcare services, as well as the ratio of households served by trash collection services to the total number of households. Public lighting is measured by the ratio of public roads equipped with lighting to total kilometers of public roads. Furthermore, I include data on the number of local police officers per 1,000 inhabitants, as well as the number of libraries per 1,000 inhabitants.

Figure 7 presents the reduced-form estimates for various public good measures. A noticeable negative trend is evident across all three measures following the implementation of the policy in 2010. Specifically, both childcare supply and library availability exhibit a declining trend that commences immediately after 2010, whereas the availability of street lighting shows a more pronounced decrease starting in 2014. Overall, the pre-trends remain relatively stable, with changes in trends emerging only after the policy was enacted, as anticipated. This stability supports the parallel trends assumption necessary for accurately estimating the causal effects of interest.

Table 5 reveals reveal significant decreases in the provision of essential public goods as a consequence of inter-municipal cooperation. For childcare, the coefficient is -0.156, indicating a statistically significant reduction at the 1% level. This suggests that

municipalities involved in inter-municipal cooperation experience a notable decline in the number of childcare facilities, with a corresponding decrease of approximately 15.6% per 1,000 inhabitants. Such a reduction raises concerns about the accessibility and availability of childcare services in cooperative municipalities.

The analysis further shows a significant impact on street lighting, with a coefficient of -0.750, which is statistically significant at the 5% level. This finding signifies a substantial decrease of 75% in the kilometers of street lighting per 1,000 inhabitants for participating municipalities, reflecting a critical decline in a service essential for public safety and community well-being. Similarly, the provision of libraries also decreases, with a coefficient of -0.003, which is significant at the 5% level. While this effect is relatively small, it nonetheless underscores the potential pitfalls of inter-municipal cooperation in maintaining public service levels.

In addition to these services, local police presence is adversely affected, with a coefficient of -0.066 that achieves statistical significance at the 1% level. This result suggests a meaningful reduction in local policing resources, which could negatively impact community safety and security. Finally, the analysis indicates a decline in trash collection services, where the coefficient is -0.638, significant at the 10% level. This outcome implies a 63.8% decrease in trash collection availability or quality, highlighting another critical area where inter-municipal cooperation may fall short of expectations.

Importantly, the robustness of these findings is consistent across various estimation methods, including bias-corrected and robust methods, as well as across different bandwidth sizes. The first-stage F-statistics, which range from 49.78 to 57.57 across the public goods analyzed, confirm the strong identification strategy employed in this study. This reassures the validity of the relationships observed between municipality size and participation in inter-municipal communities. Overall, the conventional estimation underscores significant declines in public service provision, prompting a reevaluation of

the implications of inter-municipal cooperation for essential public goods and services.

These findings collectively highlight the potential adverse effects of IMC participation on certain public goods. The negative impacts on childcare and street lighting suggest that municipalities may struggle to maintain service quality when consolidating functions under IMC. This underscores the need for policymakers to carefully consider the implications of such cooperation on public service provision, ensuring that the expected efficiencies do not come at the expense of service quality.

6.2.1. Population

Moreover, the findings do support the concept of "voting with their feet," which posits that residents may relocate in response to perceived changes in the quality of local public goods. To explore this hypothesis, I analyze change in population and in migration flows after the policy implementation. I measure changes in population as growth rate and use total net immigration for the migration flows. According to Tiebout's hypothesis, fluctuations in the quality of local public goods should incentivize residents to migrate between jurisdictions in search of an optimal balance between taxes and amenities.

Figure 8 illustrates the reduced-form estimates for the analyzed population measures, concentrating on two primary indicators: a) population growth and b) net immigration. In Subfigure a), the chart presents yearly reduced-form estimates of population growth, calculated as the logarithm of the population for municipalities with fewer than 5,000 inhabitants. The data reveal a declining trend in population growth over the observed period, suggesting challenges related to demographic dynamics within these municipalities.

Subfigure b) displays the yearly estimates of net immigration, determined by subtracting outflows from inflows of residents. The graphical representation highlights notable fluctuations in net immigration figures, reflecting the influence of local policies

and conditions on migratory patterns.

The results presented in Table 6 indicate a significant negative effect on both population growth and net immigration. Specifically, population growth decreases by approximately 6.5% to 7.3%, while net immigration reveals an increase in out-migration, quantified as a loss of approximately 88 to 89 individuals. These findings underscore the limited responsiveness of the population to changes in local public goods, suggesting a potential disconnect between public service quality and residential mobility. The results exhibit robustness to different bandwidth configurations, as evidenced by Figure A4.

6.3. Housing and land supply

On the supply side, I examine both housing and land availability. Although comprehensive data on housing construction permits in Italy is limited—aside from a snapshot from 2001—I use revenues from housing construction permits as a proxy. This revenue is calculated by multiplying the number of permits issued by the constant price of a permit during the period of interest. Thus, revenue serves as an approximate measure of variations in permits granted[8].

Regarding land supply, I utilize data from ISPRA, the Italian Higher Institute for Environmental Protection and Research, which provides information on the percentage of unused land per municipality for the years 2006, 2012, and 2015-2021. Assuming that water bodies and land with high steepness remain unchanged, reductions in unused land can be attributed to human construction activities, including buildings of various types, serving as a useful proxy.

Figure 9 provides insights into the dynamics of housing and land use in municipalities with populations under 5,000 inhabitants. The first plot, depicting house permits,

[8]This analysis assumes that the number of illegal constructions does not change significantly over time. This assumption is reasonable, given the stable enforcement of tax evasion regulations in this sector.

showcases trends over time, illustrating fluctuations in the volume of permits issued. This trend can indicate the local real estate market's health, reflecting potential demand for new housing developments. Analyzing these patterns helps stakeholders understand how regulatory environments and market conditions impact housing availability.

The second plot focuses on land use, revealing the percentage of surface area designated for construction across these small municipalities. This metric is crucial for urban planning and resource allocation, as it highlights how much land is being utilized for housing versus other purposes. The combination of these plots allows for a comprehensive overview of the relationship between housing policy, land use, and economic factors in these communities, offering valuable insights for policymakers and planners aiming to enhance housing strategies and urban development initiatives.

Table 7 presents findings that indicate no significant changes in either revenues from construction permits or land usage. These results are consistent across various specifications and bandwidths, as illustrated in Figure A5. Given that these measures are proxies and the land usage data cover only limited years, the results should be interpreted cautiously.

In conclusion, the analysis suggests that the current policy framework has not led to significant alterations in housing and land supply metrics. These observations highlight the need for further investigation into the factors influencing supply dynamics and suggest that alternative measures or datasets may be necessary to capture nuanced changes within the sector.

6.4. Expenditure

This the results related to expenditure measures, specifically focusing on two types: current expenditures—such as staff salaries and rental payments—and capital expenditures, which encompass costs associated with purchasing real estate and funding

infrastructure projects or long-term initiatives. Both types are calculated on a per capita basis and expressed in real terms (2015 euros).

To begin, I plot the yearly reduced-form RD estimates for each type of expenditure. This analysis not only examines trends but also serves as a check on a key assumption of the difference-in-discontinuity design: the absence of pre-trends, similar to a difference-in-difference approach. The expectation is that, prior to the policy's implementation, the yearly RD estimates will exhibit a flat trend; following the policy's onset, we anticipate detecting a break in the trend if the policy impacts the outcome in question.

Figure 10 displays these estimates, which represent yearly RD regressions of per capita real current and capital expenditures against the population cutoff, serving as the treatment instrument. The plots are centered around 2010, the year when the municipal union mandate was enforced for municipalities with fewer than 5,000 inhabitants. No clear pattern emerges regarding capital expenditure, while a distinct trend break is evident in current expenditure. The pre-trends appear fairly flat, but after 2010, current expenditure shows a notable increase.

Table 8 provides estimates of the effects of inter-municipal communities (IMC) on municipal expenditures, specifically differentiating between current and investment expenditures. The results indicate a statistically significant positive relationship between IMC participation and current expenditure, with a coefficient of 0.461. This suggests that municipalities involved in IMC tend to increase their current spending. This increase could reflect enhanced service delivery as communities consolidate resources and improve the efficiency of public service provision, or it might stem from the additional organizational costs associated with managing the new community. In contrast, the investment expenditure estimates reveal no significant effect, with a coefficient close to zero and no statistically significant findings. As shown in Figure A6, the findings remain significant across a range of bandwidth specifications.

The analysis also includes robust controls for demographic and economic factors, such as the proportion of workers in various sectors and the age distribution of the population. The first-stage F-statistics indicate that the instruments employed are sufficiently strong, supporting the validity of the inferences drawn regarding expenditure behaviors. These findings underscore the complexities of municipal finance dynamics under IMC arrangements, where changes primarily affect day-to-day operational spending rather than long-term investment decisions.

7. Compliers analysis

One peculiarity of this reform is the very low rate of compliance among municipalities who are mandated by law to share functions among each other. Out of a total of xxxx municipalities who satisfied the requirements to be subjected to the law, only xxxx or roughly 15% actually implemented some form of function sharing. This leaves 56% of never takers and 29% of always takers municipalities. The large share of non compliers, and particularly never takers requires some additional analysis in order to be able to gauge the external validity of ther results. If compliers are very different from non compliers, the likelihood that the LATE and the ATE are similar is small and thus requires a caveat in the interpretation of the results.

Anecdotally, municipalites were resistant to the creation of inter-municipal communities because of political reasons, if the mayors of the neighboring municipalities are not sharing the same views, structural reasons as the need to layoff workers and the union intervention which hinders the process, and technical issues, or how to concretely implement the sharing of functions.

I distinguish between two categories of non-compliers: municipalities that do not share functions when below the respective population thresholds after the policy im-

plementation in 2010, or the never-takers, and municipalities who do join an IMC independently of their population size or the policy implementation, or the always takers. I define the compliers as those municipalities who do join an IMC while being below the population thresholds from 2010 on and that do not share functions if they do not satisfy the requirements. I then follow Marbach and Hangartner (2020) method who relies on identifying observable groups based on treatment adherence while utilizing statistical techniques, specifically weighted means calculation and covariate adjustment, to infer the characteristics of the non-directly observable compliers by subtracting the means of observable always-takers and never-takers from the overall covariate mean of the sample.

Table 9 provides important insights into various characteristics of Italian municipalities, divided into four groups, including Compliers and Never-takers. When comparing Compliers and Never-takers, several differences become evident in terms of area, altitude, population, and other demographic and geographical factors.

When comparing compliers (Column 3) with never-takers (Column 2), the data reveals some key differences. For example, the mean area for compliers is 16.199 square meters with a standard deviation of 21.391, while never-takers have a mean area of 24.319 square meters and a larger standard deviation of 29.408. This indicates that never-takers typically have larger areas, but also more variability in their sizes compared to compliers.

When considering the mean altitude, compliers have an average of 176 meters, whereas never-takers are at a higher altitude with a mean of 203 meters. This may suggest that higher altitudes could be less conducive to initiative participation for never-takers, as they face different geographical challenges.

In the comparison between compliers (Column 3) and always-takers (Column 4), the differences become even more pronounced. Always-takers have a mean area of 59.257

square meters, significantly larger than that of compliers. The mean population density for compliers is not provided, but always-takers show higher values, suggesting a more consistent pattern of participation aligned with advantageous characteristics.

Additionally, the mean altitude for always-takers stands at 203 meters with a standard deviation of 295.51, again reflecting a higher elevation than compliers. This consistent engagement of always-takers in comparison to both compliers and never-takers highlights the importance of geographical and demographic factors in determining the success of program participation.

The differences between Compliers and Never-takers present significant implications for the external validity of your instrumental variable (IV) design. Compliers typically represent smaller, more densely populated municipalities that are urbanized, while Never-takers are larger, less populated, and more geographically diverse. This distinction is crucial because IV estimates primarily reflect local average treatment effects (LATE) for Compliers, meaning your findings may be more indicative of the dynamics in urbanized contexts and less applicable to the rural and geographically varied settings of Never-takers.

Consequently, the variability in characteristics between these groups can limit the generalizability of your results across all municipalities. If treatment effects differ significantly based on geographic or demographic factors, the applicability of your findings may be restricted. To enhance external validity, it might be valuable to conduct robustness checks or explore additional data that could shed light on these differences. By acknowledging these limitations in your analysis, you can provide a clearer understanding of the contexts in which your conclusions are most relevant and where they may not extend as easily, ensuring a more nuanced interpretation of your findings.

8. Conclusions

In conclusion, the exploration of jurisdiction size and inter-municipal cooperation within the Italian context has underscored the complex balance between potential benefits and inherent risks associated with consolidating municipal functions. My findings reveal that while the mandated sharing of functions aims to enhance public service delivery, it has led to significant declines in both residential and commercial housing prices, primarily driven by deteriorating local public services. This aligns with concerns expressed in the literature regarding the negative implications of forced integration on community well-being and economic vitality.

The analysis further highlights that the benefits of integration are not uniformly experienced across municipalities. Compliers—those municipalities that engage in function sharing—exhibit characteristics that distinguish them from never-takers, particularly in terms of size, population density, and geographic location. This raises critical questions about the external validity of the reported treatment effects, suggesting that results may primarily reflect the dynamics present in more urbanized contexts and not necessarily translate to rural or less densely populated municipalities.

Moreover, the overall high levels of non-compliance present significant barriers to realizing the intended outcomes of the inter-municipal cooperation framework. This reluctance underscores the necessity for policymakers to consider local contexts and specific challenges faced by municipalities when designing and implementing cooperative initiatives. As such, my research advocates for a more tailored approach that takes into account the diverse needs and capacities of municipalities to ensure that collaboration leads to meaningful improvements in service delivery and community satisfaction.

In light of the challenges identified, it is crucial for future research to further inves-

tigate the conditions under which inter-municipal cooperation can be effectively implemented. This includes examining the role of stakeholder engagement, local governance dynamics, and the socio-economic factors influencing compliance rates. Ultimately, fostering successful inter-municipal cooperation requires a nuanced understanding of the unique contexts in which these municipalities operate.

By contributing to the discourse on the optimal size of jurisdictions and the implications of municipal integration, this study aims to inform policymakers, urban planners, and scholars alike. In seeking to balance the imperatives of efficiency with the complexities of local governance, we can work toward establishing cooperative frameworks that genuinely enhance the quality of life for residents across diverse settings.

References

Accetturo, A., A. R. Lamorgese, S. Mocetti, and D. Pellegrino (2021). Housing supply elasticity and growth: evidence from Italian cities. *Journal of Economic Geography 21*(3), 367–396.

Agrawal, D. R., M.-L. Breuille, and J. L. Gallo (2024). Tax Competition with Intermunicipal Cooperation. *CESifo Working Paper* (11334).

Alesina, A. and E. Spolaore (1997). On the Number and Size of Nations. *The Quarterly Journal of Economics 112*(4), 1027–1056.

Alesina, A. and E. Spolaore (2005). *The size of nations*. Mit Press.

Allers, M. A. and J. de Greef (2018, January). Intermunicipal cooperation, public spending and service levels. *Local Government Studies 44*(1), 127–150.

Banaszewska, M., I. Bischoff, E. Bode, and A. Chodakowska (2022). Does inter-municipal cooperation help improve local economic performance? – Evidence from Poland. *Regional Science and Urban Economics 92*, 103748.

Bel, G. and M. Sebő (2021). Does Inter-Municipal Cooperation Really Reduce Delivery Costs? An Empirical Evaluation of the Role of Scale Economies, Transaction Costs, and Governance Arrangements. *Urban Affairs Review 57*(1), 153–188.

Bel, G. and M. E. Warner (2015). Inter-Municipal Cooperation and Costs: Expectations and Evidence. *Public Administration 93*(1), 52–67.

Bellodi, L., M. Morelli, and M. Vannoni (2022). A Costly Commitment: Populism, Economic Performance, and the Quality of Bureaucracy. *American Journal of Political Science 68*(1).

Bergholz, C. and I. Bischoff (2018). Local council members' view on intermunicipal cooperation: does office-related self-interest matter? *Regional Studies 52*(12), 1624–1635.

Bianchi, N., M. Giorcelli, and E. M. Martino (2022). The Effects of Fiscal Decentralization on Publicly Provided Services and Labor Markets. *SSRN Electronic Journal*.

Blesse, S. and T. Baskaran (2016). Do municipal mergers reduce costs? Evidence from a German federal state. *Regional Science and Urban Economics 59*, 54–74.

Blom-Hansen, J., K. Houlberg, S. Serritzlew, and D. Treisman (2016). Jurisdiction Size and Local Government Policy Expenditure: Assessing the Effect of Municipal Amalgamation. *American Political Science Review 110*(4), 812–831.

Bolton, P. and G. Roland (1997). The Breakup of Nations: A Political Economy Analysis. *The Quarterly Journal of Economics 112*(4), 1057–1090.

Breuillé, M.-L., P. Duran-Vigneron, and A.-L. Samson (2018). Inter-municipal cooperation and local taxation. *Journal of Urban Economics 107*, 47–64.

Brueckner, J. K. (1981). Congested public goods: The case of fire protection. *Journal of Public Economics 15*(1), 45–58.

Calonico, Cattaneo, and Titiunik (2014). Robust Data-Driven Inference in the Regression-Discontinuity Design. *The Stata Journal 14*, 909––946.

Charlot, S., S. Paty, and V. Piguet (2015). Does Fiscal Cooperation Increase Local Tax Rates in Urban Areas? *Regional Studies 49*(10), 1706–1721.

Crescenzi, R., D. Luca, and S. Milio (2016). The geography of the economic crisis in Europe: national macroeconomic conditions, regional structural factors and short-term economic

performance. *Cambridge Journal of Regions, Economy and Society 9*(1), 13–32.

Della Vigna, S. and E. La Ferrara (2010, November). Detecting Illegal Arms Trade. *American Economic Journal: Economic Policy 2*(4), 26–57.

Di Porto, E. and S. Paty (2018). Cooperation among Local Governments to Deliver Public Services: Cooperation Among Local Governments. *Politics & Policy 46*(5), 790–820.

Duncombe, W. and J. Yinger (1993). An analysis of returns to scale in public production, with an application to fire protection. *Journal of Public Economics 52*(1), 49–72.

Egger, P. and M. Koethenbuerger (2010). Government Spending and Legislative Organization: Quasi-experimental Evidence from Germany. *American Economic Journal: Applied Economics 2*(4), 200–212.

Elinder, M. and L. Persson (2017). House price responses to a national property tax reform. *Journal of Economic Behavior & Organization 144*, 18–39.

Epple, D. and T. Romer (1989). On the flexibility of municipal boundaries. *Journal of Urban Economics 26*(3), 307–319.

Ermini, B. and F. Fiorillo (2009). L'assetto federale e le forme di associazionismo intercomunale. *PRISMA Economia - Società - Lavoro*, 77–96.

Fenizia, A. and R. Saggio (2024). Organized crime and economic growth: Evidence from municipalities infiltrated by the mafia. *American Economic Review 114*, 2171–2200.

Ferraresi, M., G. Migali, and L. Rizzo (2018). Does intermunicipal cooperation promote efficiency gains? Evidence from Italian municipal unions. *Journal of Regional Science 58*(5), 1017–1044.

Fishel (2001). The Homevoter Hypothesis. *National Tax Journal 54*(1), 157–173.

Frère, Q., M. Leprince, and S. Paty (2014). The Impact of Intermunicipal Cooperation on Local Public Spending. *Urban Studies 51*(8), 1741–1760.

Gagliarducci, S. and T. Nannicini (2013). Do Better Paid Politicians Perform Better? Disentangling Incentives from Selection. *Journal of the European Economic Association 11*(2), 369–398.

Galindo-Silva, H., N. H. Some, and G. Tchuente (2021). Fuzzy Difference-in-Discontinuities: Identification Theory and Application to the Affordable Care Act. *arXiv:1812.06537*.

Grembi, V., T. Nannicini, and U. Troiano (2016). Do Fiscal Rules Matter? *American Economic Journal: Applied Economics 8*(3), 1–30.

Harjunen, O., T. Saarimaa, and J. Tukiainen (2021). Political representation and effects of municipal mergers. *Political Science Research and Methods 9*(1), 72–88.

Ivaldi, G., G. Marinuzzi, F. Quintiliani, and W. Tortorella (2016). Le Unioni di Comuni in Italia: Strumenti Efficienti a Quali Condizioni? *mimeo*.

Luca, D. and F. Modrego (2021, January). Stronger together? Assessing the causal effect of inter-municipal cooperation on the efficiency of small Italian municipalities. *Journal of Regional Science 61*(1), 261–293.

Marbach, M. and D. Hangartner (2020). Profiling Compliers and Noncompliers for Instrumental-Variable Analysis. *Political Analysis 28*(3), 435–444.

McCrary, J. (2008). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics 142*(2), 698–714.

Miller, S., L. R. Wherry, and D. G. Foster (2023). The Economic Consequences of Being Denied an Abortion. *American Economic Journal: Economic Policy 15*(1), 394–437.

Millán-Quijano, J. (2020). Fuzzy difference in discontinuities. *Applied Economics Letters 27*(19), 1552–1555.

Oates, W. E. (1969). The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis. *Journal of Political Economy 77*(6), 957–971.

Oates, W. E. (1972). *Fiscal Federalism*. Edward Elgar Publishing.

Oates, W. E. (1999). An Essay on Fiscal Federalism. *Journal of Economic Literature 37*(3), 1120–1149.

Oliviero, T., A. Sacchi, A. Scognamiglio, and A. Zazzaro (2019). House prices and immovable property tax: Evidence from OECD countries. *Metroeconomica 70*(4), 776–792.

Ostrom, E. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems. *American Economic Review 100*(3), 641–672.

Ostrom, V., C. M. Tiebout, and R. Warren (1961). The Organization of Government in Metropolitan Areas: A Theoretical Inquiry. *American Political Science Review 55*(4), 831–842.

Picchetti, P., C. C. X. Pinto, and S. T. Shinoki (2024). Difference-in-Discontinuities: Estimation, Inference and Validity Tests. *arXiv:2405.18531v1*.

Pickering, S., S. Tanaka, and K. Yamada (2020, July). The impact of municipal mergers on local public spending: Evidence from remote-sensing data. *Journal of East Asian Studies 20*(2), 243–266.

Reingewertz, Y. (2012). Do municipal amalgamations work? Evidence from municipalities in Israel. *Journal of Urban Economics 72*(2), 240–251.

Saarimaa, T. and J. Tukiainen (2015). Common pool problems in voluntary municipal mergers. *European Journal of Political Economy 38*, 140–152.

Shi, M. and A. Tulli (2020). Free to Spend? The Effect of Fiscal Autonomy on Local Governments. *Working paper*.

Tiebout, C. M. (1956). A Pure Theory of Local Expenditures. *Journal of Political Economy 64*(5), 416–424.

Tricaud, C. (2025). Better Alone? Evidence on the Costs of Intermunicipal Cooperation. *American Economic Journal: Applied Economics 17*(1), 160–207.

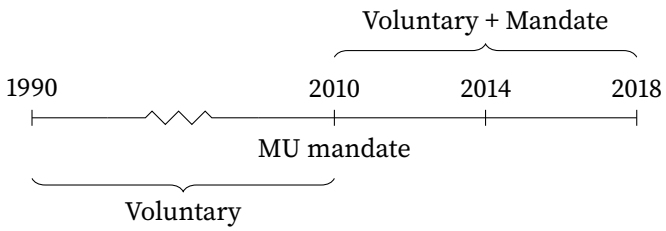
Warner, M. E. (2006). Inter-municipal Cooperation in the U.S.: A Regional Governance Solution? *Urban Public Economics Review* (6), 221–240.

Welling Hansen, S. (2014). Common pool size and project size: an empirical test on expenditures using Danish municipal mergers. *Public Choice 159*(1), 3–21.

Wolfschütz (2020). Joint Discussion Paper. *AGKS Joint Discussion Paper Series in Economics*.

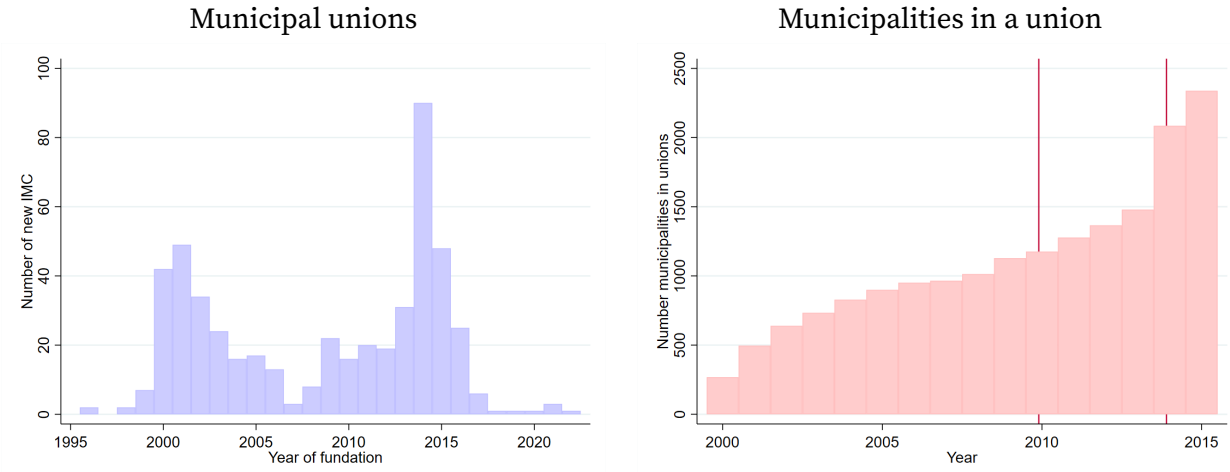
Zurla, V. (2023). How Should We Design Parental Leave Policies? Evidence from Two Reforms in Italy. *SSRN Electronic Journal*.

FIGURE 1. Inter-Municipal Cooperation timeline



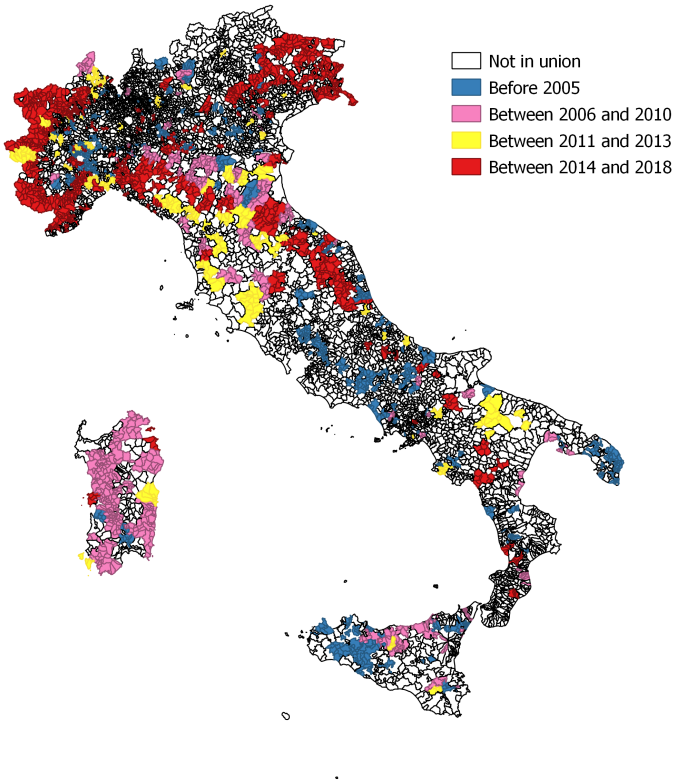
- In 1990, municipal unions were introduced in the Italian public law. Municipalities were free to join but they had to merge after 10 years of union.
- In 2000, the mandatory fusion requirement has been removed.
- In 2010, Italy passed a law that **mandate** municipalities with less than 5,000 inhabitants to join a MU.
- In 2014, the discipline of municipal unions have been simplified, reducing the types of unions existing, facilitating the internal organization, etc.

FIGURE 2. Inter-municipal community statistics



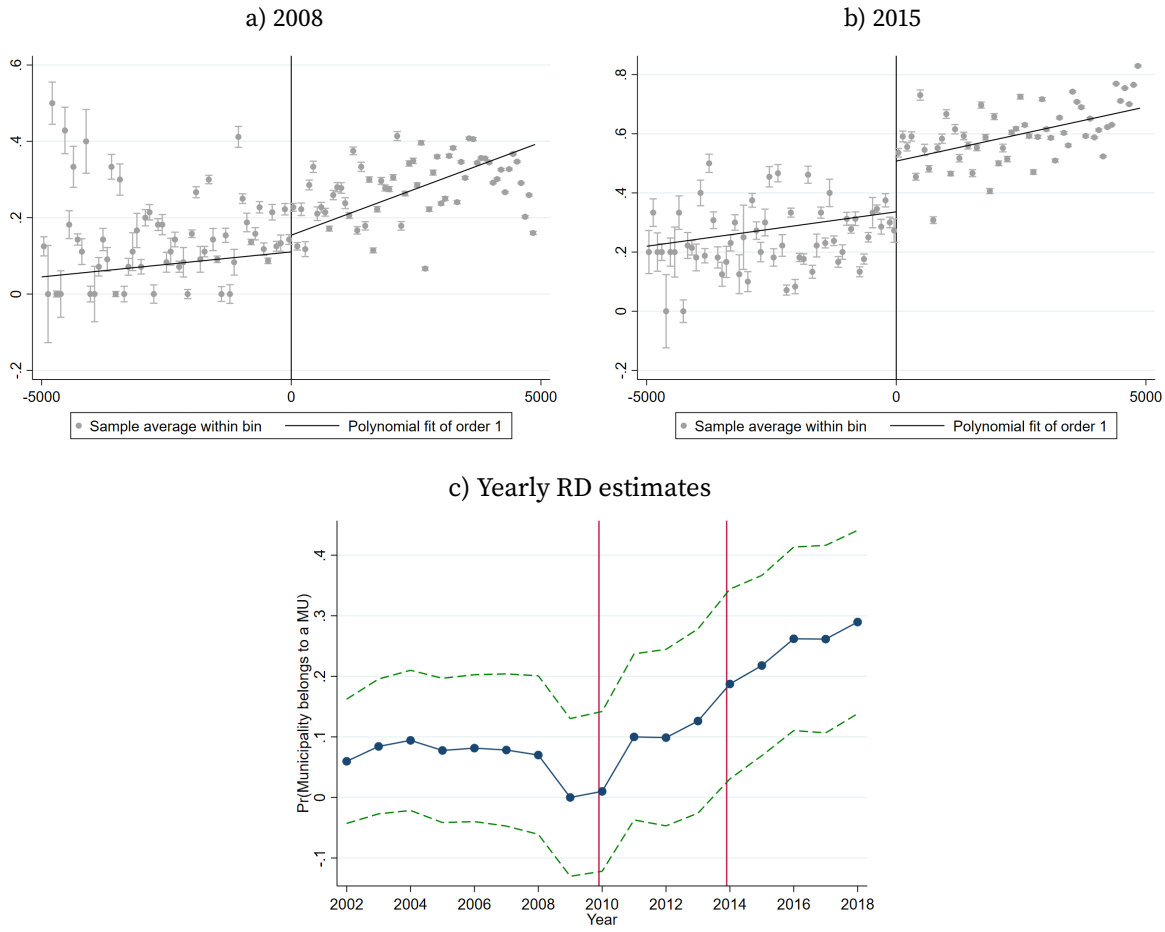
Note: The plot on the left reports the number of municipal unions by year of foundation, the plot on the right shows the number of municipalities in a municipal union by year.

FIGURE 3. Map of inter-municipal communities over time



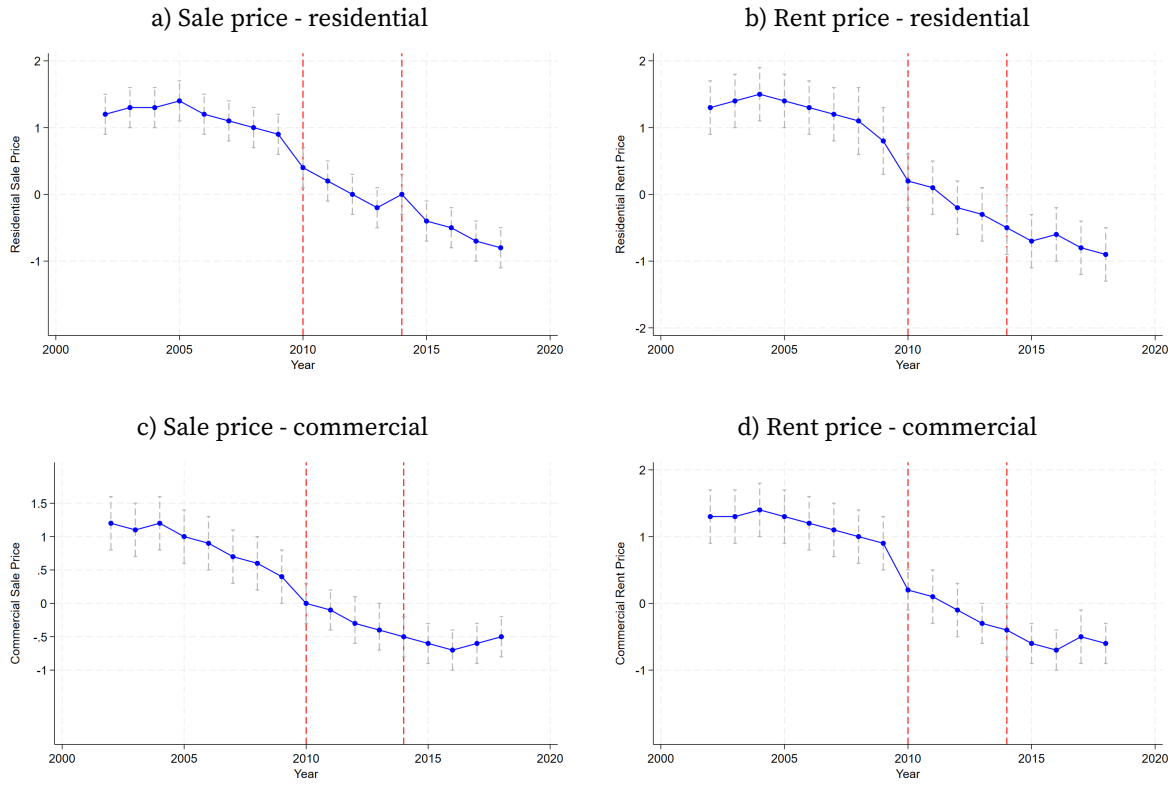
Note: The map shows Italian municipalities borders and their status, in or not in an IMC. For the municipalities in an IMC, the different colors indicate the different time period when the municipality first joined an IMC. Yellow and red refer to those municipalities which joined an IMC after the 2010 mandate.

FIGURE 4. Regression Discontinuity estimates



Note: This figure shows the RD estimates for the probability of belonging to an IMC over time. Subfigures a) and b) show RD plots for the years 2008 and 2015, before and after the IMC reform, respectively. The running variable is centered around 5000 and the dots above the cutoff represent municipalities with less than 5000 inhabitants and viceversa. Subfigure c) shows yearly RD coefficients; each dot is the RD estimate from a regression of a dummy variable equal to one if a municipality is part of a municipal union in a certain year. The dotted line represents 95% confidence intervals and the two red vertical lines indicate the two stages of the reform, implementation in 2010 and reinforcement in 2014. The optimal bandwidth is computed using Calonico et al. (2014), the polynomial is first degree, and the kernel is triangular.

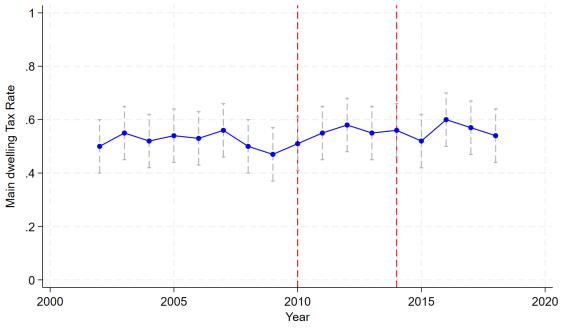
FIGURE 5. Reduced form estimates for house prices



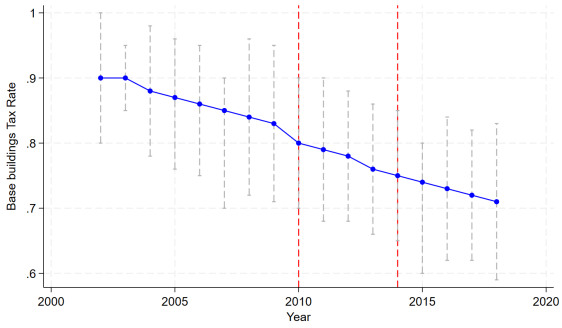
Note: These plots show the yearly reduced form estimates of house price measures on the instrument, having less than 5,000 inhabitants. Subfigures a) and b) report sale and rent prices for residential buildings, respectively. Subfigures c) and d) show the same plots for house prices of industrial buildings. The kernel used is triangular, and the bandwidths are computed using the Calonico et al. (2014) algorithm.

FIGURE 6. Reduced form estimates for property tax rates

a) Main dwelling

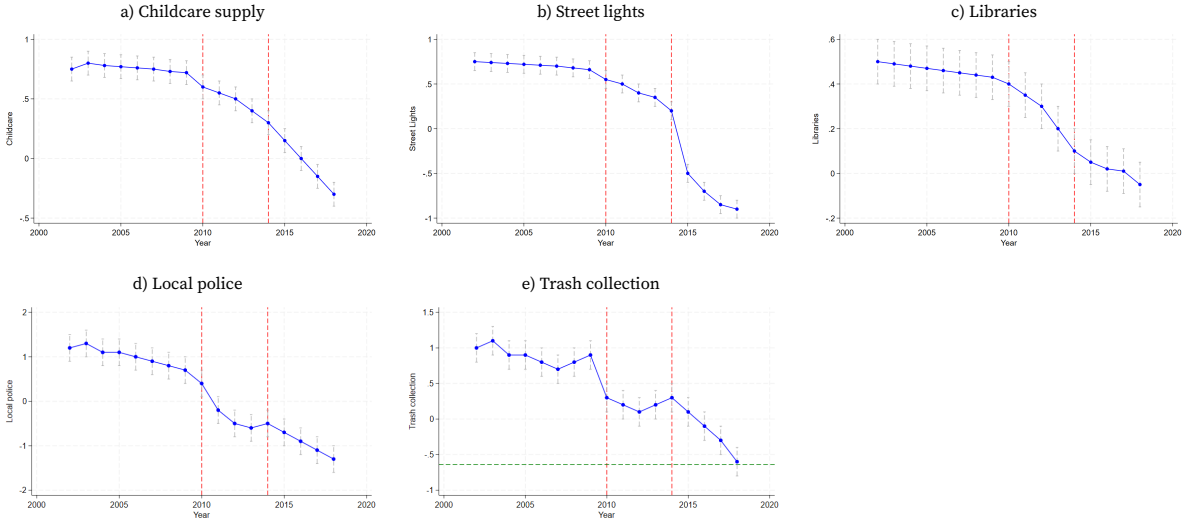


b) Base building



Note: These plots show the yearly reduced form estimates of property tax rates on the instrument, having less than 5,000 inhabitants. Subfigure a) shows the main dwelling tax rate, and b) the base building tax rate. The kernel used is triangular, and the bandwidths are computed using the Calonico et al. (2014) algorithm.

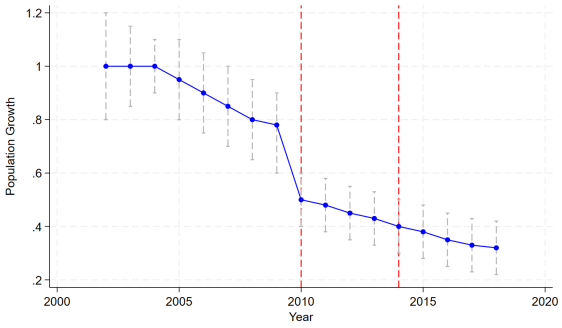
FIGURE 7. Reduced form estimates for public good quality



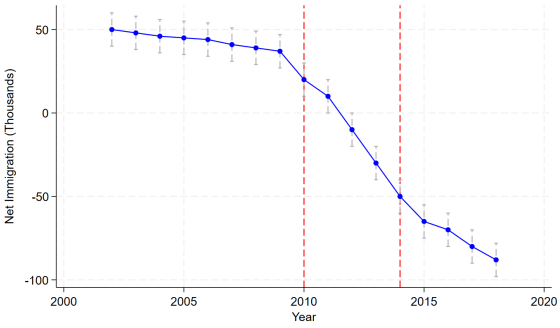
Note: These plots show the yearly reduced form estimates of house price measures on the instrument, having less than 5,000 inhabitants. Subfigure a) reports chilcare supply, b) shows street lights supply, c) the number of libraries per 100,000 inhabitants, d) number of local policemen per 100,000 inhabitants, and e) trash collected per capita. The kernel used is triangular, and the bandwidths are computed using the Calonico et al. (2014) algorithm.

FIGURE 8. Reduced form estimates for population measures

a) Population growth



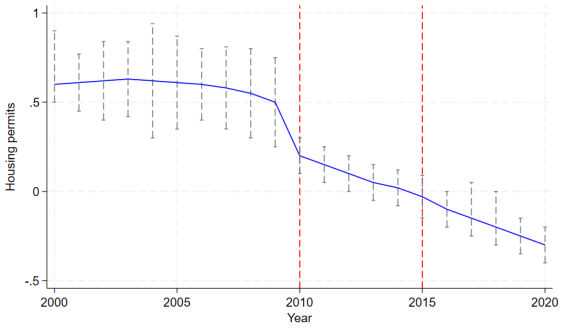
b) Net immigration



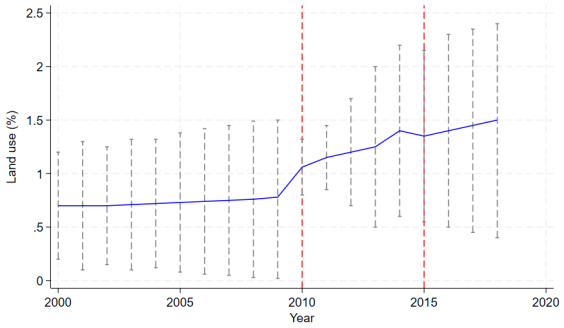
Note: These plots show the yearly reduced form estimates of house price measures on the instrument, having less than 5,000 inhabitants. Subfigure a) shows population growth computes as the logarithm of population and b) reports net immigration computed as the difference between in- and out-migration. The kernel used is triangular, and the bandwidths are computed using the Calonico et al. (2014) algorithm.

FIGURE 9. Reduced form estimates for housing supply

a) House permits



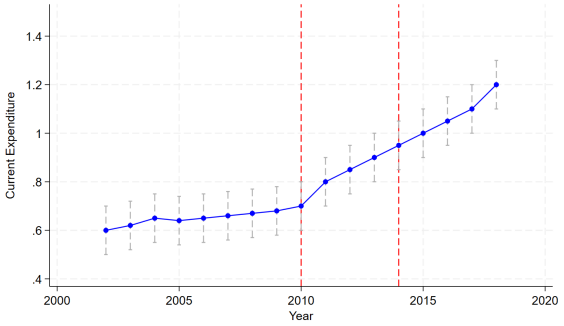
b) Land use



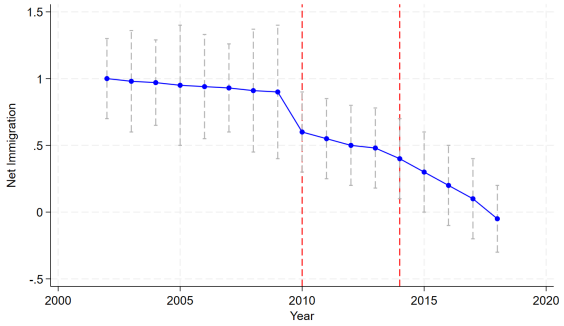
Note: These plots show the yearly reduced form estimates of house price measures on the instrument, having less than 5,000 inhabitants. Subfigure a) shows the revenues from house permits per capita, in logs and 2015 real euros and b) reports the percentage of surface used by constructions for a municipalities. The kernel used is triangular, and the bandwidths are computed using the Calonico et al. (2014) algorithm.

FIGURE 10. Reduced form estimates for expenditure

a) Current



b) Capital



Note: These plots show the yearly reduced form estimates of expenditure measures on the instrument, having less than 5,000 inhabitants. Subfigure a) shows current expenditure and b) capital expenditure. The kernel used is triangular, and the bandwidths are computed using the Calonico et al. (2014) algorithm.

TABLE 1. Geographical distribution of inter-municipal communities

Region	IMC	Municipalities	Avg. # municipalities	Avg. mun population
Abruzzo	12	75	6.25	3851.67
Basilicata	4	27	6.75	1712.75
Calabria	14	64	4.57	3364.86
Campania	19	90	4.74	6266.53
Emilia-Romagna	41	266	6.49	7914.02
Lazio	21	102	4.86	2451.48
Liguria	20	91	4.55	2490.5
Lombardia	75	258	3.44	2238.45
Marche	20	121	6.05	4098
Molise	11	61	5.55	2850.27
Piemonte	116	753	6.49	1749.96
Puglia	23	111	4.83	11966.7
Toscana	23	136	5.91	6809.30
Umbria	2	16	8	10348
Veneto	43	198	4.60	7125.98
Total	525	2369	5.54	5015.9

Notes: The table shows the number of inter-municipal communities (IMC), the number of municipalities that are part of an IMC, the average number of municipalities, and the average population per IMC.

TABLE 2. Summary statistics

	(1) Treated		(2) Untreated	
	Mean	SD	Mean	SD
Panel A: Outcomes				
Residential sale price	859.16	319.56	1179.67	481.11
Residential rent price	2.97	1.36	4.15	1.92
Commercial sale price	607.99	237.62	842.80	334.51
Commercial rent price	2.85	1.24	4.02	1.69
Panel B: Mechanism				
Main dwelling tax rate	0.48	0.18	0.45	0.18
Base building tax rate	0.60	0.07	0.63	0.07
Population	1549.34	1233.79	19890.09	76492.00
Net immigration	7.08	36.01	105.33	484.82
Childcare	0.02	0.11	0.05	0.07
Street lights	2.23	1.00	1.51	0.65
Local police	0.52	0.45	0.56	0.24
Trash collection	6.17	3.44	5.98	3.52
Libraries	0.26	0.59	0.08	0.08
House permit revenues 35.08	43.42	46.00	41.86	
Land use	5.81	5.77	16.75	13.31
Current expenditure	622.70	326.86	467.40	194.95
Capital expenditure	97.77	173.15	50.13	98.09
Panel C: Controls				
Area (km^2)	27.35	28.98	57.52	72.33
Population density	128.20	212.98	604.44	966.34
Altitude (m)	419.51	306.57	231.60	230.77
North-West	0.43	0.50	0.28	0.45
North-East	0.14	0.35	0.23	0.42
Center	0.11	0.31	0.15	0.36
South and Islands	0.31	0.46	0.34	0.47
Rural	0.85	0.36	0.23	0.42
Mountainous	0.37	0.48	0.21	0.41
Observations	75,829		32,931	

Notes: This table shows the summary statistics (mean and standard deviation) of the outcomes and control variables used in the main analysis. *Treated* means having 2010 population below 5000 inhabitants (or 3000 inhabitants for mountainous municipalities). All prices in Panel A are computed in logs. In Panel B, property tax rates are in percentage points; childcare is defined as the ratio between accepted demands and available spots, street lights are computed per 100km, and libraries are computed per 1000 inhabitants. Land use is in percentage. The expenditures are in per capital real terms using 2015 euros. In Panel C, all variables are indicators, unless otherwise stated.

TABLE 3. House prices

	Residential		Commercial	
	(1)	(2)	(3)	(4)
	ln(sale)	ln(rent)	ln(sale)	ln(rent)
Conventional	-0.043**	-0.060**	-0.115***	-0.150**
	(0.014)	(0.029)	(0.033)	(0.049)
First-stage F	37.78	38.38	21.24	20.85
Bias-corrected	-0.040**	-0.062**	-0.131***	-0.181**
	(0.014)	(0.029)	(0.033)	(0.049)
First-stage F	42.09	42.75	23.71	23.28
Robust	-0.040*	-0.062*	-0.131***	-0.181*
	(0.022)	(0.34)	(0.037)	(0.058)
First-stage F	34.53	34.64	19.17	18.92
Mean	1236.243	4.385	890.597	4.289
Bandwidth	1211	1427	1950	1068
Observations	7,463	7,463	7,554	7,554

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. All dependent variables are in logs, while the means are reported as non-transformed . The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

TABLE 4. Property Taxes

	(1) Main dwelling	(2) Base
Conventional	0.014	-0.036
	(0.018)	(0.023)
First-stage F	31.04	25.17
Bias-corrected	-0.023	-0.035
	(0.018)	(0.023)
First-stage F	33.22	27.59
Robust	-0.023	-0.035
	(0.020)	(0.027)
First-stage F	27.56	21.93
Mean	0.48	0.74
Bandwidth	794	995
Observations	7,895	7,895

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The dependent variables are property tax rate for main dwelling and other buildings (in %). The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

TABLE 5. Public goods

	(1) Childcare	(2) Street lights	(3) Libraries	(4) Local police	(5) Trash collection
Conventional	-0.156***	-0.750**	-0.003**	-0.066***	-0.638*
	(0.045)	(0.372)	(0.001)	(0.023)	(0.487)
First-stage F	54.74	57.57	55.56	49.78	51.87
Bias-corrected	-0.145***	-0.723**	-0.002**	-0.080***	-0.600*
	(0.045)	(0.372)	(0.001)	(0.023)	(0.487)
First-stage F	58.64	61.35	59.28	52.18	56.24
Robust	-0.145***	-0.723**	-0.002**	-0.080***	-0.600
	(0.061)	(0.386)	(0.003)	(0.027)	(0.532)
First-stage F	52.29	54.29	50.12	45.56	47.53
Mean	0.055	16.946	0.181	0.718	47059.07
Bandwidth	1292	1045	702	714	1259
Observations	5,563	7,850	7,856	5,825	10,156

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The dependent variables are public good measures (log childcares per 1000 inhabitants and log kilometers of street lights per 1000 inhabitants, and the number of libraries per 1000 inhabitants). The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

TABLE 6. Population

	(1) Log(Population)	(2) Net Immigration
Conventional	-0.065***	-88.737***
	(0.020)	(10.177)
First-stage F	59.12	59.64
Bias-corrected	-0.073***	-89.554***
	(0.020)	(10.177)
First-stage F	62.32	63.52
Robust	-0.073***	-89.554***
	(0.032)	(12.256)
First-stage F	57.02	56.84
Mean	19,656.65	58.128
Bandwidth	488	1092
Observations	7,895	7,895

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The dependent variables are population growth and net immigration. The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

TABLE 7. Housing and land supply

	(1) Housing supply	(2) Land use
Conventional	0.537	-0.054
	(0.539)	(0.800)
First-stage F	23.79	99.72
Bias-corrected	0.690	-0.088
	(0.539)	(0.800)
First-stage F	22.82	105.4
Robust	0.690	-0.088
	(0.650)	(0.954)
First-stage F	14.55	68.54
Mean	39.56	42.659
Bandwidth	1241	1149
Observations	6,488	6,330

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The dependent variables are current and investment expenditures (in per capita and 2015 real terms). Means are reported non-transformed. The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

TABLE 8. Expenditure

	(1) Current	(2) Investment
Conventional	0.461**	-1.89
	(0.222)	(1.500)
First-stage F	22.66	21.95
Bias-corrected	0.420**	-1.79
	(0.222)	(1.500)
First-stage F	20.82	20.20
Robust	0.420**	-1.79
	(0.260)	(1.723)
First-stage F	13.43	13.09
Mean	474.942	42.659
Bandwidth	864	1149
Observations	6,488	6,330

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The dependent variables are current and investment expenditures (in per capita and 2015 real terms). Means are reported non-transformed. The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

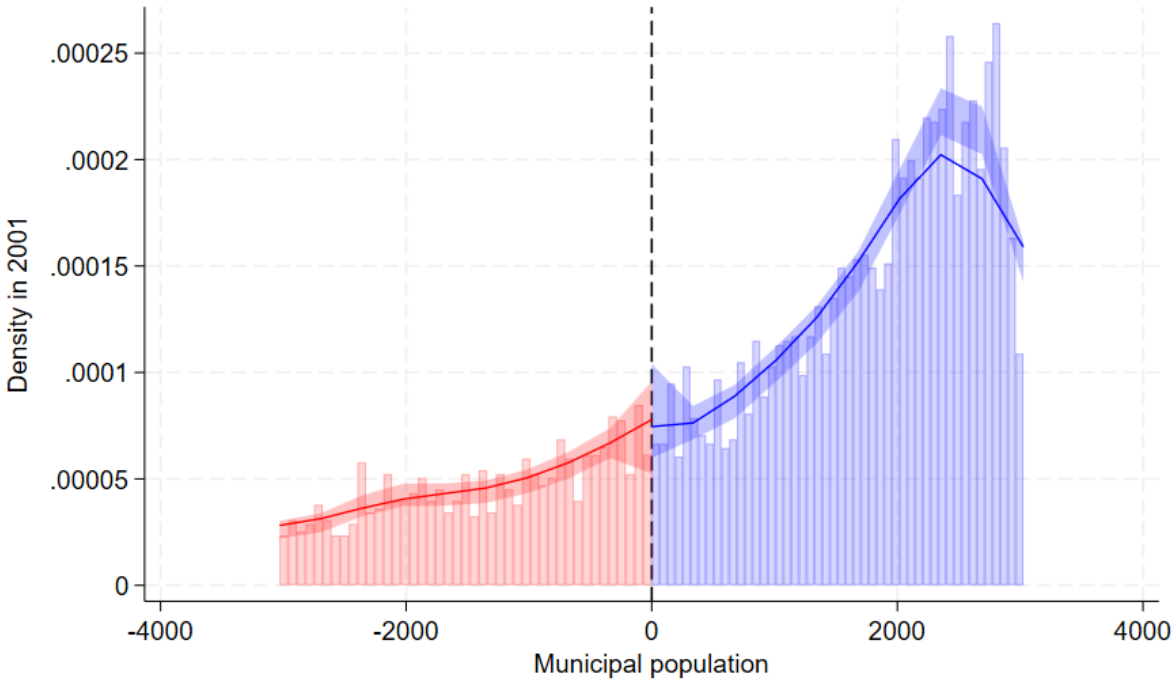
TABLE 9. Compliers analysis

	(1) Whole sample	(2) Compliers	(3) Never-takers	(4) Always-takers
Area (sqm)	37.709	46.199	24.319	59.257
	(0.137)	(1.091)	(0.119)	(0.513)
Altitude (m)	354.975	430.848	394.360	240.659
	(0.804)	(6.013)	(1.282)	(2.037)
Coastal	0.082	0.131	0.045	0.128
	(0.001)	(0.006)	(0.001)	(0.003)
Island	0.004	-0.000	0.006	0.003
	(0.000)	(0.001)	(0.000)	(0.000)
Population density	297.579	703.575	164.920	348.497
	(1.696)	(14.206)	(1.167)	(4.264)
North-West	0.381	0.631	0.432	0.156
	(0.001)	(0.010)	(0.002)	(0.003)
North-East	0.174	-0.079	0.144	0.359
	(0.001)	(0.009)	(0.002)	(0.004)
Center	0.122	0.122	0.106	0.150
	(0.001)	(0.006)	(0.001)	(0.003)
South	0.324	0.326	0.318	0.334
	(0.001)	(0.008)	(0.002)	(0.004)
Rural	0.637	0.619	0.803	0.326
	(0.001)	(0.011)	(0.002)	(0.004)
Mountaineous	0.313	0.273	0.347	0.268
	(0.001)	(0.008)	(0.002)	(0.004)
Share of municipalities	100%	14.4%	56.5%	29.1%

Notes: This table presents summary statistics of the time-invariant characteristics of the municipalities for the whole sample (column 1), compliers (column 2), never-takers (column 3), and always-takers (column 4). The covariate means for the compliers, never-takers, and always-takers are calculated using the approach in Marbach and Hangartner (2020). Bootstrapped standard errors are reported in parentheses.

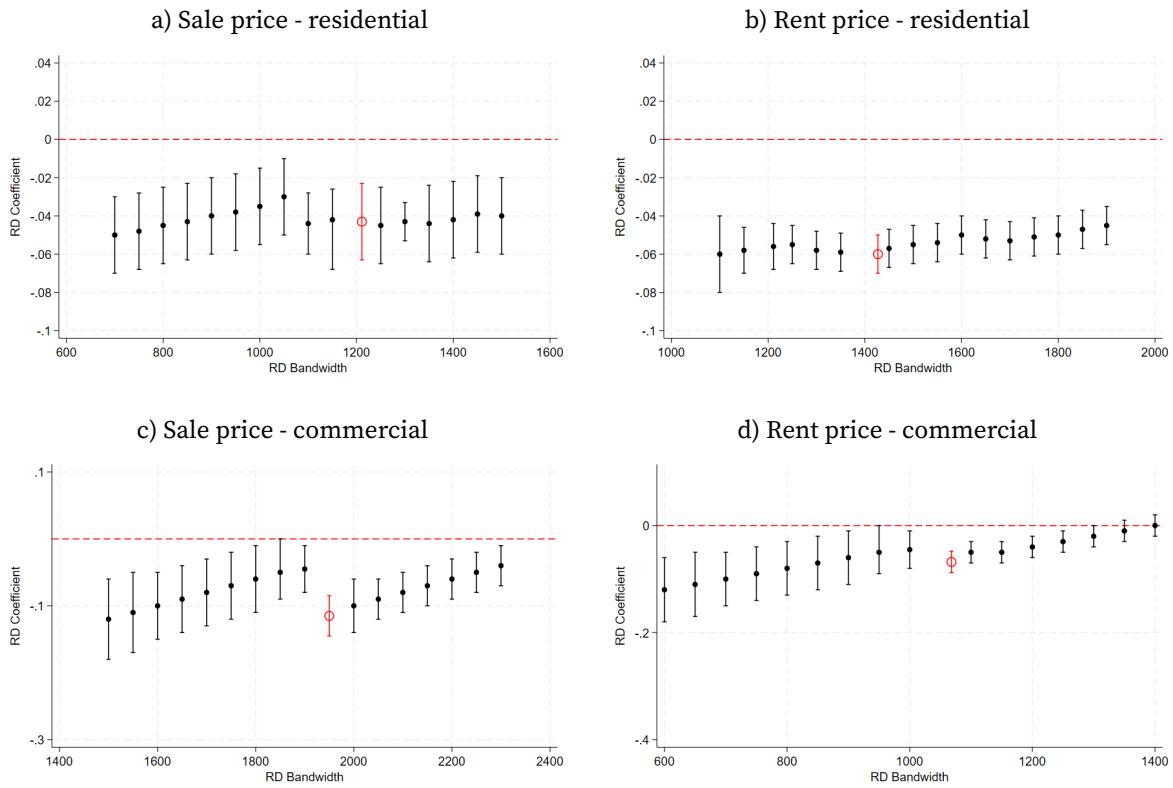
Appendix A. Other Figures

FIGURE A1. McCrary's test



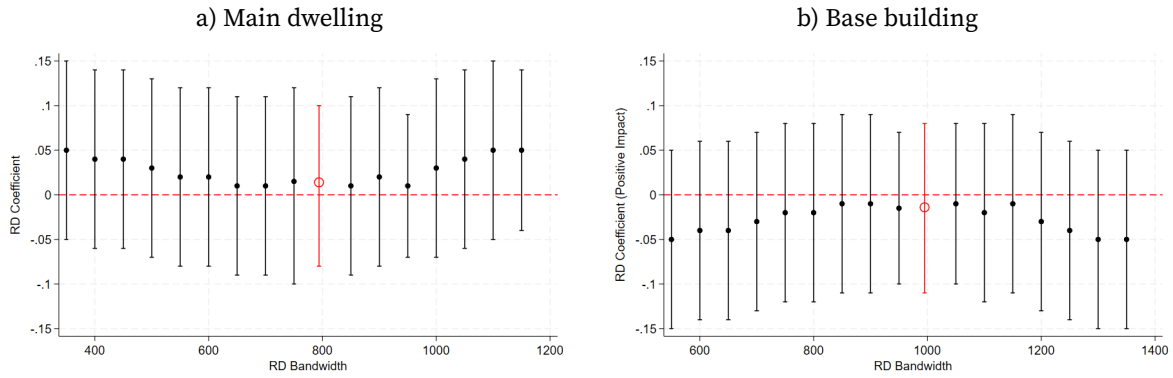
Note: This figure illustrates the results of the McCrary test for discontinuities in the population count at the cutoff. The population used by the law is the 2010 intercensal population.

FIGURE A2. House prices - Different bandwidths



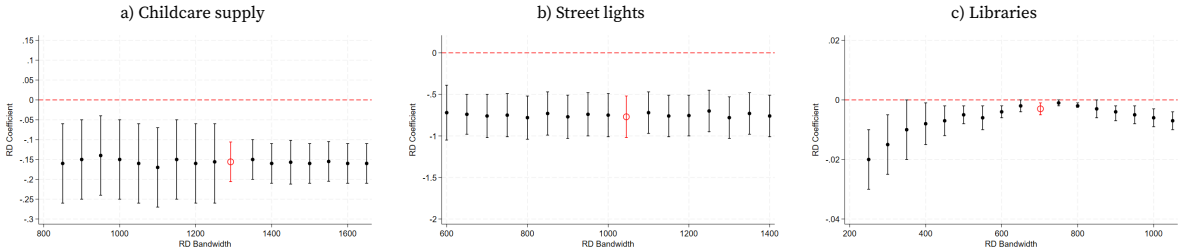
Note: This figure displays plots of estimates corresponding to varying bandwidth sizes. The dependent variables are sale and rent prices for both residential and commercial properties, with values computed in logarithmic terms. The main estimate, highlighted in red, utilizes the optimal bandwidth as determined by the method proposed by Calonico et al. (2014).

FIGURE A3. Property tax rates - Different bandwidths



Note: This figure displays plots of estimates corresponding to varying bandwidth sizes. The dependent variables are property tax rates for main dwelling and base buildings. The main estimate, highlighted in red, utilizes the optimal bandwidth as determined by the method proposed by Calonico et al. (2014).

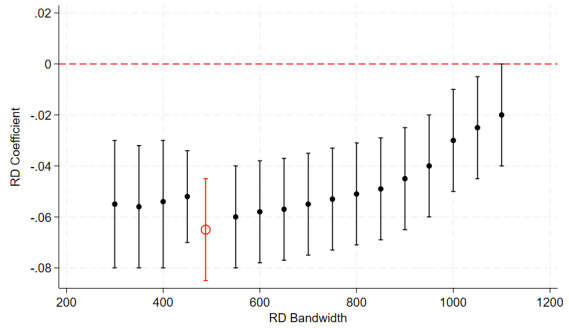
FIGURE A4. Public good quality - Different bandwidths



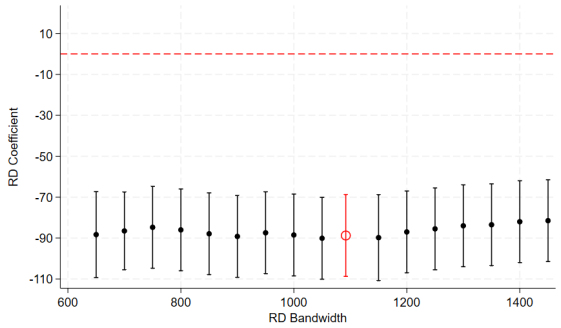
Note: This figure displays plots of estimates corresponding to varying bandwidth sizes. The dependent variables are childcare supply, street light supply and number of libraries per 100,000 inhabitants. The main estimate, highlighted in red, utilizes the optimal bandwidth as determined by the method proposed by Calonico et al. (2014).

FIGURE A5. Population - Different bandwidths

a) Population growth



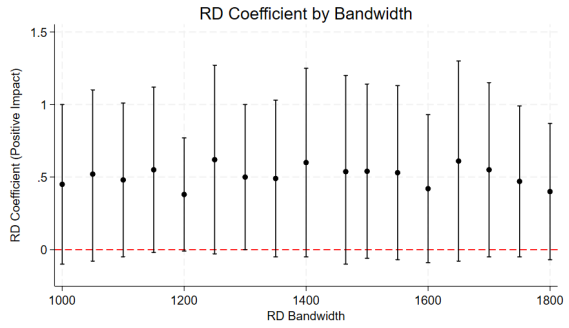
b) Net migration



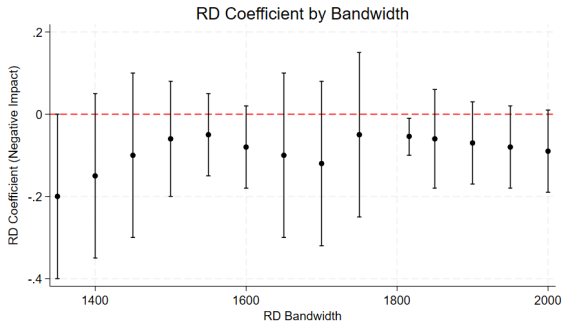
Note: This figure displays plots of estimates corresponding to varying bandwidth sizes. The dependent variables are population growth rate and net migration. The main estimate, highlighted in red, utilizes the optimal bandwidth as determined by the method proposed by Calonico et al. (2014).

FIGURE A6. Supply - Different bandwidths

a) House permits



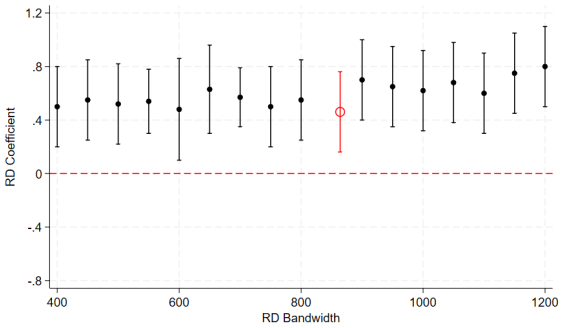
b) Land use



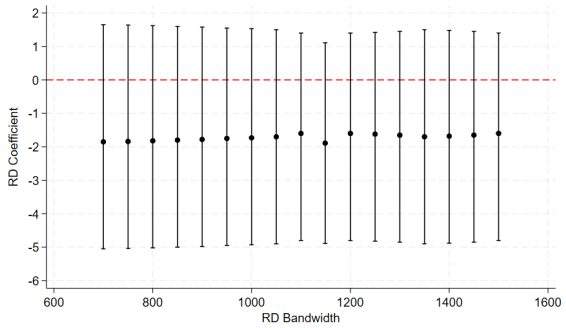
Note: This figure displays plots of estimates corresponding to varying bandwidth sizes. The dependent variables are the revenues from housing permits, in logs, per capita and real 2015 euros, and the percentage of used land in a municipality. The main estimate, highlighted in red, utilizes the optimal bandwidth as determined by the method proposed by Calonico et al. (2014).

FIGURE A7. Expenditure - Different bandwidths

a) Current

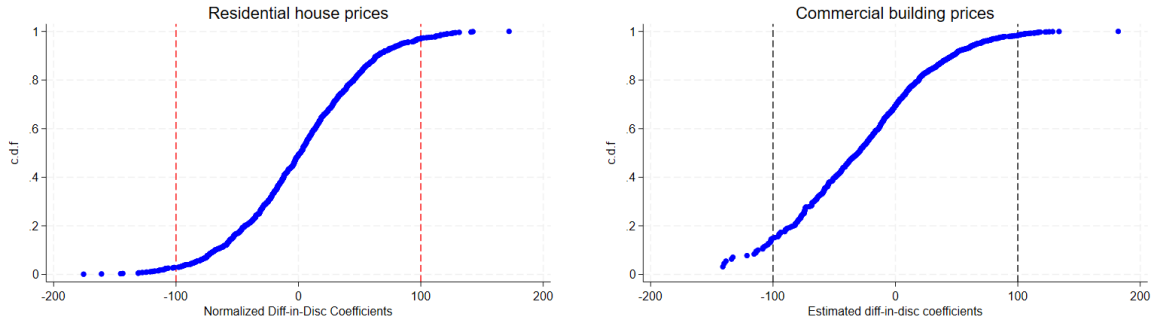


b) Investments



Note: This figure displays plots of estimates corresponding to varying bandwidth sizes. The dependent variables are current and capital expenditures, in logs, per capita and real 2015 euros. The main estimate, highlighted in red, utilizes the optimal bandwidth as determined by the method proposed by Calonico et al. (2014).

FIGURE A8. Placebo test - House prices



a) Residential prices

b) Commercial prices

Note: Placebo tests based on permutation methods for the probability of re-election. The figures reports the empirical c.d.f. of normalized point estimates from a set of diff-in-disc estimations at 400 false thresholds below and above the true thresholds at 5,000 (namely at any 5 inhabitants from 4,000 to 4,900 and any 5 inhabitants from 5,100 to 6,000). Estimation methods: local linear probability model. The optimal bandwidth h is estimated implementing the algorithm introduced by Calonico et al. (2014). The vertical line indicates our benchmark estimate (i.e. true coefficient normalized to 100) and its negative value.

Appendix B. Other Tables

TABLE A1. Continuity of covariates

	(1) North West	(2) North East	(3) Center	(4) South	(5) Area (km^2)	(6) Altitude (m)	(7) Rural	(8) Mountainous
Conventional	-0.025	-0.021	-0.001	0.068	3.558	-2.888	0.036	0.002
	(0.380)	(0.364)	(0.133)	(0.458)	(46.710)	(150.629)	(0.415)	(0.272)
First-stage F	6.117	5.039	14.22	3.980	3.979	13.49	4.621	15.69
Bias-corrected	-0.021	-0.023	0.001	0.111	2.767	-3.036	0.054	0.007
	(0.380)	(0.364)	(0.133)	(0.458)	(46.710)	(150.629)	(0.415)	(0.272)
First-stage F	9.649	6.889	23.51	3.059	2.704	23.40	3.365	25.70
Robust	-0.021	-0.023	0.001	0.111	2.767	-3.036	0.054	0.007
	(0.455)	(0.436)	(0.157)	(0.557)	(57.979)	(180.010)	(0.493)	(0.334)
First-stage F	6.726	4.769	16.09	2.125	1.810	15.71	2.357	17.48
Observations	37,845	41,715	21,016	52,924	54,202	22,042	47,367	18,388
Bandwidth	1455							
Mean	0.381	0.174	0.122	0.324	37.71	355	0.637	0.313

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The table reports difference-in-discontinuity for a selection of time-varying municipal characteristics including the age composition of the population, the share of foreign residents, population density, and per capita income. The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The covariates are indicator variables for geographical area (North-West, North-East, Center, and South), municipal area in squared kilometers, altitude of the municipality in meters, an indicator for a rural municipality, and an indicator for a mountainous municipality. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).

TABLE A2. House prices - Absolute prices

	Residential		**Commercial**	
	(1)	(2)	(3)	(4)
	Sale	Rent	Sale	Rent
Conventional	114.801**	0.138	-5.034	0.166
	(50.934)	(0.162)	(35.584)	(0.265)
First-stage F (Conv.)	39.39	37.78	20.64	21.60
Bias-corrected	104.324**	0.113	-18.938	0.309
	(50.934)	(0.162)	(35.584)	(0.265)
First-stage F (Bias-corr.)	43.88	42.09	23.04	24.11
Robust	104.324*	0.113	-18.938	0.309
	(60.029)	(0.193)	(42.572)	(0.313)
First-stage F (Robust)	35.81	34.44	18.75	19.46
Observations	10,191	15,893	13,184	7,693
Mean	1056	3.593	753.8	3.511
Bandwidth	993	1141	1540	1087

Notes: The table reports difference-in-discontinuity estimates for house price outcomes, separated by building category (residential and commercial). The F statistics are for the first stage regressions of the probability to belong to an IMC on the treatment status, i.e., having less than 5,000 inhabitants in 2010.

TABLE A3. House prices - Other polynomial specifications

	Residential		Industrial	
	(1)	(2)	(3)	(4)
	ln(sale)	ln(rent)	ln(sale)	ln(rent)
Panel A: 2nd degree polynomial				
Estimate	-0.035**	-0.071*	-0.113**	-0.010*
	(0.018)	(0.043)	(0.058)	(0.006)
First-stage F	52.64	54.52	39.06	48.23
Panel B: 3rd degree polynomial				
Estimate	-0.020*	-0.073	-0.138**	-0.145
	(0.012)	(0.138)	(0.070)	(0,269)
First-stage F	50.47	33.97	34.24	46.73
Observations	15,969	11,302	13,322	17,778
Mean	6.827	1.462	6.517	1.456
Bandwidth	1219	1493	1618	1849

Notes: The table reports difference-in-discontinuity estimates for house price outcomes, separated by building category (residential and commercial). The polynomial form of the running variable is second-degree (Panel A) and third-degree (Panel B). The F statistics are for the first stage regressions of the probability to belong to an IMC on the treatment status, i.e., having less than 5,000 inhabitants in 2010.

TABLE A4. House prices - Including controls

	Residential		**Commercial**	
	(1)	(2)	(3)	(4)
	ln(sale)	ln(rent)	ln(sale)	ln(rent)
Conventional	-0.045**	-0.058**	-0.114***	-0.148**
	(0.015)	(0.028)	(0.032)	(0.050)
First-stage F	37.80	38.20	21.30	20.90
Bias-corrected	-0.038**	-0.060**	-0.132***	-0.179**
	(0.015)	(0.028)	(0.032)	(0.050)
First-stage F	43.00	42.60	23.80	23.30
Robust	-0.042*	-0.061*	-0.129***	-0.182*
	(0.021)	(0.036)	(0.036)	(0.057)
First-stage F	34.80	34.70	19.10	19.00
Mean	1236.243	4.385	890.597	4.289
Bandwidth	1350	1500	2050	1100
Observations	7,463	7,463	7,554	7,554

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors clustered at the municipality level are reported in parentheses. The table reports difference-in-discontinuity for a selection of time-varying municipal characteristics including the age composition of the population, the share of foreign residents, population density, and per capita income. The F statistics are for the first stage regressions of the probability to belong to an IMC on an indicator for having less than 5,000 (3,000 if mountaineous) inhabitants. The covariates are indicator variables for geographical area (North-West, North-East, Center, and South), municipal area in squared kilometers, altitude of the municipality in meters, an indicator for a rural municipality, and an indicator for a mountainous municipality. The optimal bandwidth is estimated the MSE-optimal bandwidth selector of Calonico et al. (2014).