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Tax incentives and Housing Renovation: Evidence from France

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Tax incentives and Housing Renovation: Evidence from France

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Abstract

This paper investigates the impact of the Denormandie tax incentive, introduced in 2019 to promote the renovation of dilapidated housing in medium-sized French municipalities. The study employs a spatial difference-in-differences framework, exploiting geographic discontinuities at municipal boundaries induced by the policy to identify causal effects. The analysis focuses on areas within a 1–5 kilometer range of the policy boundary to ensure robust identification while addressing potential spillover effects from neighboring untreated zones. The findings reveal a 19% increase in building permits and a 32.3% rise in renovated rental units within the treated zones. Additionally, vacant housing sales increased by 18%, reflecting the reintegration of underutilized properties into the active housing market. These impacts were resilient to displacement effects and robust to different distance specifications. Furthermore, the policy induced a temporary 2% decline in older housing prices, which dissipated within two years as the market adjusted. This study highlights the effectiveness of renovation-focused tax incentives in addressing housing market inefficiencies and fostering urban revitalization. The findings offer actionable insights for policymakers seeking to balance housing affordability with urban regeneration objectives.

Keywords: Public Policy, Housing Price, Difference-in-Differences, Dynamic treatment effects.

JEL Codes: R31, R38, C23, H71

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1 Introduction

The housing affordability crisis has become a critical issue in many advanced economies, including France, where rising housing costs, coupled with stagnant wage growth, have significantly increased rent burdens on households (Glaeser and Gyourko 2018). In response, governments have implemented a variety of policy interventions aimed at stabilizing housing markets and alleviating affordability pressures. A central debate in urban economics concerns whether these interventions should focus on demand-side solutions, such as housing vouchers or subsidies, or prioritize supply-side strategies that seek to increase housing availability (Apgar 1990; Olsen 2003).

In France, supply-side interventions, which focus on stimulating the construction or rehabilitation of housing units, have long been a cornerstone of housing policy. Beginning with the *dispositif Quilès-Méhaignerie* in 1984, successive French governments have implemented tax incentives to encourage private investment in rental housing, particularly for low-income tenants (Bosvieux 2011). Over the years, these programs have expanded substantially, with government spending on housing tax incentives quadrupling between 2005 and 2018, reaching an estimated 2 billion euros annually under stable conditions (Deniau 2019). Despite these significant expenditures, questions persist regarding the effectiveness of such policies in expanding affordable housing supply, given the theoretical ambiguities and limited empirical evidence on their outcomes (Sinai and Waldfogel 2005; Eriksen and Rosenthal 2010; Chapelle, Vignolles, and G. Wolf 2018).

A key challenge in evaluating supply-side policies lies in their dependence on the elasticity of housing supply in targeted areas. Housing supply elasticity—defined as the responsiveness of housing stock to price changes—plays a crucial role in determining whether increased demand results in more housing units or simply drives up prices (Fack 2006; Guillaume Chapelle, Eyméoud, and C. Wolf 2023). In regions with inelastic housing supply, such as many French urban centers, studies have documented systematic price increases following policies designed to expand supply, including rent subsidies, subsidized loans, and tax in-

centives (Labonne 2015; P. Bono and Trannoy 2019). These findings suggest that, in some cases, policies aimed at improving housing affordability may inadvertently exacerbate the problem by driving up prices rather than increasing the availability of affordable housing.

In 2019, the French government introduced the Denormandie scheme, a new supply-side policy targeting housing shortages in medium-sized municipalities experiencing economic decline and population loss. Unlike previous policies focused on new construction, the Denormandie scheme offers tax incentives for the renovation of dilapidated housing stock as part of the broader *Action Cœur de Ville* initiative.[1] This shift toward rehabilitating underutilized properties represents a strategic pivot aimed at reintegrating these units into the rental market, thus addressing both housing shortages and urban decay.

The Denormandie scheme was implemented not merely as a measure to alleviate housing shortages but also to mitigate underlying market inefficiencies and socio-economic disparities. In regions characterized by high vacancy rates and underutilized housing stock, private investment in renovations has been inhibited by low anticipated returns. This has perpetuated market inefficiencies, leaving potentially viable housing units unoccupied. By offering targeted tax incentives for renovations, the scheme aims to correct these inefficiencies, encouraging private actors to reintegrate deteriorated housing units into the active housing market. Furthermore, the policy addresses broader socio-economic objectives by prioritizing municipalities marked by urban decay and concentrated low-income populations. These factors exacerbate geographic inequalities and adversely affect urban economic health.

The Denormandie scheme also addresses key inefficiencies in earlier supply-side interventions, especially in areas where housing supply elasticity is limited by geographic or regulatory constraints. By prioritizing the renovation of existing properties over new construction—particularly in locations where new development faces barriers—the scheme offers a potentially more efficient strategy for increasing affordable housing supply (Redding and

[1]The *Action Cœur de Ville* initiative is a French program launched in 2017 to revitalize the urban cores of medium-sized municipalities facing economic and demographic challenges. It supports housing, business, and infrastructure development to enhance urban attractiveness. See more details in the Appendix.

Rossi-Hansberg 2016; P. Bono and Trannoy 2019). This approach reduces the risk of driving up property prices by avoiding the cost pressures typically associated with new construction, while also facilitating the return of vacant and underutilized properties to the rental market. As such, the Denormandie scheme presents a promising policy tool for promoting urban revitalization in regions constrained by spatial limitations and market rigidities.

Despite its potential, the Denormandie scheme's impact remains underexplored. While a large body of literature has evaluated the effects of tax incentives on new housing construction (Eriksen and Rosenthal 2010; Chapelle, Vignolles, and G. Wolf 2018; P. Bono and Trannoy 2019; Chareyron, Ly, and Trouvé-Sargison 2021), few studies have rigorously assessed the effectiveness of tax incentives aimed at renovating and rehabilitating existing housing stock, especially in economically declining areas. This research seeks to address that gap by analyzing the Denormandie scheme's effects on housing prices, local economic revitalization, and housing availability. Utilizing a difference-in-differences (DiD) framework, this study assesses whether the policy successfully stimulated investment and revitalized urban centers.

This study employs a spatial difference-in-differences (DiD) framework to evaluate the causal effects of the Denormandie scheme, following the methodologies of Overman and Einio 2012 and Kline and Moretti 2014. Geographic discontinuities at municipal boundaries are exploited to compare treated municipalities eligible for the policy with neighboring ineligible municipalities. This boundary-based approach isolates policy effects from broader regional trends and addresses concerns about unobservable spatial characteristics.

To strengthen causal identification, treated and control areas are defined within a geographically constrained 1–5 kilometer radius of the policy boundary. This design minimizes heterogeneity and ensures comparability of pre-treatment trends. To address potential displacement effects—where investment might shift from untreated to treated areas—the analysis excludes transactions within the immediate 1-kilometer ring surrounding the boundary, where spillover risks are most pronounced. Additionally, treatment distances are varied

within the 1–5 kilometer range in 2-kilometer increments (e.g., 1 km, 3 km, and 5 km) to test the robustness of the results, reinforcing the validity of the empirical strategy and enhancing confidence in the generalizability of the results.

To assess potential displacement externalities in untreated areas, complementary spatial analyses compare real estate activity across different distances from the boundary in non-eligible municipalities. Specifically, trends in untreated areas within the 0–5 kilometer and 5–10 kilometer ranges are analyzed to determine whether observed changes reflect displacement effects, broader spillovers, or purely localized impacts.

The findings reveal that the Denormandie tax incentive significantly boosted housing renovation activity. Building permits increased by 19%, and the number of renovated rental units rose by 32.3% within 1–5 kilometers of the policy boundary. Vacant housing sales grew by 18%, reflecting the reintegration of underutilized properties into the active housing market. These effects remained consistent across varying distances, underscoring the robustness of the results and the policy's effectiveness.

Displacement effects in non-treated municipalities were negligible, as renovation activity and housing prices remained stable in spatial comparisons with non-eligible areas. Within treated zones, the policy induced a temporary 2% decline in prices for older housing stock, likely driven by an increase in vacant housing sales that temporarily exceeded demand in the older housing segment. However, this decline dissipated within two years as the market adjusted.

These findings provide new evidence on the short- and medium-term effects of renovation-focused tax incentives. Unlike studies primarily examining new construction subsidies, this analysis addresses the underexplored impacts of policies targeting dilapidated housing in economically declining areas. By employing a spatial difference-in-differences framework, the study isolates policy effects from displacement and spillover dynamics. The results underscore the potential of renovation-based incentives to expand housing availability while mitigating urban decay, offering key insights for policymakers addressing housing shortages

and promoting sustainable urban revitalization.

The remainder of this paper is structured as follows: Section 2 reviews the relevant literature and policy background. Section 3 outlines the data. Section 4 describes the empirical strategy, followed by the presentation of results in Section 5. Section 6 concludes with a discussion of the findings and policy implications.

2 Related literature and policy overview

2.1 Related literature

This research contributes to the growing body of literature on the economic impacts of housing tax incentives, with a particular emphasis on policies aimed at stimulating investment in the renovation of existing housing stock. While tax incentives have been extensively studied in relation to new housing construction, relatively limited attention has been given to their role in promoting housing renovation. This gap is particularly relevant in the context of urban revitalization efforts, where the renovation of existing housing stock can play a critical role in restoring underutilized urban areas, especially in medium-sized municipalities .

In the United States, the Low-Income Housing Tax incentive (LIHTC) has been a cornerstone of housing policy, extensively studied for its role in encouraging housing development. Notable studies, such as those by Sinai and Waldfogel (2005) and Eriksen and Rosenthal (2010), have documented the LIHTC's success in attracting investment to affordable housing. However, these studies also highlight a redirection of funds towards alternative housing types, which in some cases has limited the expansion of affordable housing stock (Sinai and Waldfogel 2005, Eriksen and Rosenthal 2010). Similarly, McClure (2019) critiques the LIHTC for exacerbating socioeconomic segregation in metropolitan areas, as it often fails to increase supply in markets where affordability is most constrained (McClure 2019). These findings underline a broader issue in the literature: while tax incentives are powerful tools for stimulating investment, their effects on housing markets vary significantly across regions

and housing types.

In France, tax incentives have also played a central role in housing policy. For instance, Rigaud, Gay, and Barthélemy (2008) evaluated the *Robien* tax incentive, which was introduced to boost housing construction, finding a positive impact on housing production in regions benefiting from the policy (Rigaud, Gay, and Barthélemy 2008). More recent studies, such as Chapelle, Vignolles, and Wolf (2018), reported that the cessation of the *Borloo-Robien* tax scheme did not significantly impact housing stock growth, but did contribute to a deflationary effect on housing prices (Chapelle, Vignolles, and G. Wolf 2018). Bono and Trannoy (2019) further observed that the scheme led to rising land prices, suggesting inflationary pressures on property values (P.-H. Bono and Trannoy 2019). In Lyon, Chareyron, Ly, and Trouvé-Sargison (2021) found that tax incentives had a differential impact on housing prices, with new housing units experiencing price increases while older units saw a reduction (Chareyron, Ly, and Trouvé-Sargison 2021). These studies provide a nuanced understanding of the role of tax incentives in influencing housing supply and prices, but they primarily focus on new housing construction rather than renovation.

While the above studies provide valuable insights into the effects of housing tax incentives on new construction, there is a notable gap in the literature regarding the impact of tax incentives on the renovation and rehabilitation of existing housing stock. The Denormandie scheme, which specifically targets the renovation of older housing units in medium-sized municipalities, addresses this gap. Unlike broader tax incentive programs that cover both renovation and new construction[2], the Denormandie scheme offers a targeted approach to urban revitalization through housing rehabilitation.

Massié (2022), for example, examined financial aid schemes related to energy-efficient renovations, finding that such incentives significantly influence homeowner decisions to retrofit older properties (Massié 2022). Similarly, Dohollou (2023) explored how tax benefits through real estate investment funds (SCPIs) have attracted significant investment into the French

[2]Such as Loi Besson; (Loi Besson Ancien 1999-2006)-(Loi Besson neuf 1999-2006).

housing market, particularly for renovation projects (Dohollou 2023). However, these studies do not provide a regional or urban context that is central to understanding the potential of tax incentives like the Denormandie scheme to stimulate comprehensive urban renewal.

Our study aims to fill this gap by focusing on the Denormandie scheme's impact within the medium-sized municipalities targeted by the *Action Cœur de Ville* initiative. This initiative provides a unique context for studying the effects of tax incentives on housing renovation in areas that face significant economic and demographic challenges.

2.2 Policy Overview

The Denormandie scheme is an integral component of the *Action Cœur de Ville* (ACV) initiative, launched in 2018 to revitalize medium-sized French municipalities facing economic stagnation, population decline, and deteriorating housing conditions. The scheme specifically incentivizes the renovation of neglected housing stock through tax benefits, aiming to promote urban regeneration in the designated ACV areas.

Medium-sized French municipalities, defined as those with populations between 20,000 and 100,000 inhabitants and representing approximately 21% of the national population, have been disproportionately impacted by the decline of industrial activities and the concentration of economic resources in larger metropolitan regions Stratégie 2016. These trends have contributed to weakened infrastructure and aging housing stock, exacerbating social and economic challenges. According to a report by France Stratégie (2016) on Territorial Dynamics and Inequalities, these municipalities face diminishing economic opportunities, rising unemployment, and growing low-income populations. To address these issues, the ACV initiative focuses on five key objectives: the rehabilitation of city-center housing, the promotion of local economic development, improvement in mobility and accessibility, renovation of cultural heritage, and the enhancement of public services[3].

The French government initially allocated €5 billion over five years for the ACV initia-

[3]More details in Appendix.

tive, with further funding extended through 2026. These funds support a range of urban development projects, such as the creation of educational institutions, the rehabilitation of urban wastelands, and the renovation of public spaces. One of the primary mechanisms for addressing housing challenges is the Denormandie scheme, which provides tax incentives to encourage the renovation of existing properties in ACV areas.

Implemented on January 1, 2019, the Denormandie scheme offers tax incentives to private landlords who renovate deteriorated or unhealthy housing stock in medium-sized municipalities. Initially set to expire in 2022, the scheme has been extended to align with the ACV timeline. The program prioritizes the renovation of existing housing over new construction, with eligible renovations including energy efficiency improvements such as thermal insulation and heating system upgrades, provided these renovations account for at least 25% of the total transaction cost. The scheme is restricted to private landlords, excluding firms and agencies.

Landlords can claim a tax incentive based on the acquisition price of the property, up to a maximum of €300,000. The tax incentive is scaled according to the length of the rental contract: 12% of the acquisition value for a six-year contract, 19% for a nine-year contract, and 21% for contracts lasting twelve years or longer. The maximum tax incentive per property is capped at €63,000 and is calculated using the following formula:

$$\text{AnnualDTC} = \left[\frac{1}{6}(0.12 \times \mathbf{1}_6) + \frac{1}{9}(0.18 \times \mathbf{1}_9) + \frac{1}{12}(0.21 \times \mathbf{1}_{12})\right] \times \min(P, 300000)$$

where $\mathbf{1}_6$, $\mathbf{1}_9$, and $\mathbf{1}_{12}$ are dummy variables that equal one for rental contracts of six, nine, and twelve years, respectively, and P is the acquisition price capped at €300,000.

Eligibility for the tax incentive requires a minimum rental contract duration of six years, rental prices below the intermediate rent barometer set by the government,[4] and the prop-

[4]The French zoning system (A, A bis, B1, B2, C) establishes rent caps based on regional housing market tension. See Table 13 for details on rent caps by zone.

erty's location in one of the 234 municipalities designated by the ACV initiative.

The Denormandie scheme specifically targets areas with high vacancy rates and underinvestment in housing and infrastructure (Desquinabo 2024; Stratégie 2016). Its zoning approach ensures that tax incentives are concentrated in municipalities most in need of urban revitalization.

One of the primary challenges in these municipalities is the prevalence of vacant housing, often due to poor physical conditions and energy inefficiency. High vacancy rates depress property values, reduce land-use efficiency, and limit the ability of these areas to attract both residents and businesses, exacerbating economic decline. The Denormandie scheme addresses these issues by incentivizing the renovation of vacant and neglected properties, transforming them into habitable units that support urban renewal.

The broader objective of the Denormandie scheme is to promote the rehabilitation of older, deteriorating housing units in urban centers, encouraging the repopulation of city centers and stimulating local economic activity (Glaeser and Gyourko 2005). By prioritizing the renovation of existing housing stock over new construction, the policy reflects a strategic shift in urban planning toward sustainability and revitalization. This emphasis also aligns with the growing demand for affordable and energy-efficient housing, modernizing the housing stock in medium-sized urban areas while addressing environmental and social challenges.

The Denormandie scheme serves as a targeted response to two primary challenges: addressing market failures in underinvested urban areas and mitigating socio-economic inequalities associated with the concentration of low-income populations in medium-sized municipalities. High vacancy rates and poor housing conditions in these areas signal a market failure, where the cost of renovation often exceeds the expected financial returns, discouraging private investment. By providing tax incentives for renovation, the scheme aims to correct this imbalance and stimulate revitalization in urban centers critical to economic and social cohesion.

Beyond addressing market failures, the policy aims to mitigate socio-economic chal-

lenges arising from the geographical concentration of deprivation. Reports from France Stratégie (Stratégie 2016) highlight diminished economic opportunities and elevated rates of low-income populations in these municipalities, rendering them increasingly vulnerable to decline without targeted government intervention. As part of the broader *Action Cœur de Ville* (ACV) initiative, the Denormandie scheme aligns with overarching objectives of promoting social equity through neighborhood revitalization and the development of affordable, habitable housing units.

While this paper primarily evaluates the scheme's effectiveness in stimulating renovations and influencing housing outcomes, a comprehensive policy evaluation would require an assessment of the financial costs of tax incentives relative to their long-term benefits. By late 2022, the program had exceeded its initial objectives, with financial commitments from the state and its partners surpassing €5 billion. Given the scheme's extension and substantial funding allocation, future research should examine the cost-effectiveness of these fiscal measures over time, particularly in relation to the scale of urban regeneration achieved. Such an analysis should explore whether the investment in tax incentives translates into sustainable economic benefits, including enhanced property quality, improved local infrastructure, and a more resilient housing stock that supports the socio-economic vitality of these municipalities.

In this context, the Denormandie scheme highlights the delicate balance policymakers must strike between offering financial incentives substantial enough to elicit meaningful market responses and ensuring the efficient allocation of public resources. By targeting municipalities disproportionately affected by vacancy and urban decay, the program employs a geographically focused intervention designed to address localized housing market failures. This approach seeks to maximize socio-economic benefits through urban regeneration while minimizing inefficiencies associated with broad-based fiscal measures. The scheme underscores the critical role of place-based policies in addressing spatial inequalities and revitalizing underperforming urban areas.

2.3 Conceptual framework

The Denormandie scheme operates through several mechanisms that collectively influence urban housing markets and broader urban revitalization efforts. The policy's design integrates demand- and supply-side incentives, each contributing distinctively to its overall impact.

On the demand side, the scheme reduces the effective cost of acquiring and renovating neglected properties through substantial tax incentives, lowering financial barriers to investment in underutilized urban areas. These incentives make renovation projects in weaker housing markets more attractive to investors, thereby increasing transaction volumes. By reducing the investment threshold, the policy enables acquisitions and renovations that would otherwise be financially unfeasible.

Another driver of demand stems from the intrinsic value of property ownership in France, where real estate is regarded as a form of *patrimoine*—a cultural and financial asset. Beyond serving as a secure investment, property ownership represents a tangible legacy for future generations. This patrimonial perspective amplifies demand for housing units eligible under the scheme, particularly as renovations enhance their resale value. By improving both the functional and aesthetic quality of underutilized units, investors position these properties for higher market valuations post-renovation. This dual benefit of immediate tax relief and potential capital appreciation underscores the scheme's appeal, especially in markets where long-term value growth is a significant consideration for investors.

In addition to capital gains, investors may derive financial returns through rental income. However, the scheme requires compliance with rental caps on renovated units, restricting rental income relative to non-eligible areas with unrestricted rents[5]. These caps, summarized in Table 13, ensure that rents remain below market rates, positioning the tax incentive as the primary financial benefit. Despite limitations on rental income, the scheme remains

[5]The rental caps vary by zoning (A bis, A, B1, B2/C), reflecting regional housing market conditions. Higher caps are observed in zones with greater market tension.

attractive by balancing immediate fiscal benefits with long-term patrimonial gains.

On the supply side, the policy seeks to increase the availability of affordable rental units by incentivizing landlords to rehabilitate vacant or deteriorated properties into habitable rentals. By mandating minimum rental periods and rent caps for tax eligibility, the scheme directly enhances the supply of quality, affordable rental units in designated *Action Cœur de Ville* areas.

Additionally, the scheme alleviates liquidity constraints in urban housing markets by transforming previously undesirable or vacant properties into market-ready units. Before intervention, these properties were often deemed financially unviable due to their deteriorated state or high renovation costs. By altering the financial equation through tax incentives, the policy enables the rehabilitation of such properties, thereby broadening the housing supply and alleviating pressure on existing stock. This increase in liquidity fosters greater market efficiency and enhances the overall dynamism of targeted urban areas.

Beyond direct demand and supply effects, the scheme is expected to generate positive externalities that extend its benefits to the broader urban environment. Improved housing quality and increased population density in previously underpopulated areas can stimulate local economic activity and attract businesses. As revitalized neighborhoods attract more residents, demand for retail, services, and amenities rises, creating opportunities for local businesses and drawing additional investment. Over time, this concentration of economic activity may lead to enhanced infrastructure and public services, further increasing the area's appeal and economic viability. These externalities could reinforce initial policy impacts by fostering a self-sustaining cycle of growth and investment, ultimately contributing to a more balanced urban development landscape (Glaeser and Gyourko 2005; De Groot, Poot, and Smit 2009).

The Denormandie scheme thus operates through a combination of demand, supply, and externality mechanisms, with the relative influence of each channel varying by local market conditions. For example, in areas with high vacancy rates, supply-side effects may domi-

nate as idle properties are introduced into the market. In regions with moderate demand potential, positive externalities and portfolio considerations could play a larger role as businesses and services capitalize on the influx of residents. Observed outcomes, such as changes in transaction volumes and renovation activity, reflect the interplay of these channels, suggesting that the scheme's impact arises from a nuanced interaction of demand, supply, and externality effects, with tax incentives serving as the central driver.

3 Context and data

This study utilizes the *Demande de Valeur Foncière Version 3F* (DV3F) dataset, an enriched version of the standard DVF dataset, curated by the General Directorate of Public Finance (DGFiP) in collaboration with Cerema. The DV3F dataset provides transaction-level data on real estate across mainland France and the Overseas Departments and Regions (excluding Alsace-Moselle and Mayotte), spanning from 2010 to 2022. This comprehensive dataset includes key variables such as transaction prices, property characteristics (e.g., total area, number of rooms), and precise geolocation data, offering highly granular insights into housing market dynamics. The richness of the DV3F dataset is particularly advantageous for evaluating the impacts of policy interventions like the Denormandie scheme, designed to stimulate housing renovation.

Transaction Dataset - A critical feature of the DV3F dataset is its distinction between transactions involving new and existing housing stock. This allows for an evaluation of the Denormandie scheme's specific focus on renovating existing housing in medium-sized towns, enabling a detailed assessment of how different segments of the housing market are affected. The dataset's geospatial precision, augmented by cadastral references, further facilitates spatial analysis of policy effects, particularly in relation to proximity to policy-eligible municipalities.

The analysis focuses on real estate dynamics between 2014 and 2022, capturing both the

pre- and post-policy periods surrounding the implementation of the Denormandie scheme in 2019[6]. This time frame allows for a robust analysis of the policy's effects on market outcomes while accounting for broader economic trends. The sample is restricted to transactions involving residential properties, excluding land exchanges and non-residential properties. To ensure that the analysis reflects meaningful housing market activity, transactions below €40,000 are excluded to filter out outliers and non-standard sales.

The primary unit of observation in the DV3F dataset is the individual real estate transaction, allowing for a detailed and granular analysis of housing market dynamics. Each record corresponds to a unique property transaction, and we analyze these at the transaction level rather than aggregating them geographically. This approach enables a thorough examination of price trends, while controlling for each property's characteristics, in response to the Denormandie scheme.

Vacant Properties - The DV3F dataset also includes information on transactions involving vacant properties, which is crucial for evaluating the Denormandie scheme's broader urban renewal goals. Vacant property transactions are identified using both transaction records and tax data, enabling us to track changes in vacancy rates and assess whether the policy has successfully brought underutilized housing stock back into the market. For the analysis, the sale of vacant units is aggregated at the municipal level, with transactions grouped by year. This creates a balanced panel, assigning a value of zero if no vacant units were sold in a given year.

Building Permits Dataset - To complement the DV3F data and evaluate changes in housing supply, we integrate data from the *Sitadel* database, which records building permits and urban planning authorizations across France. Sitadel tracks building permits for both residential and commercial projects and classifies permits based on project type (e.g., new

[6]France's zoning system divides municipalities into four zones (A, A bis, B1, B2, and C) based on real estate market conditions, including housing demand and market pressure. Using the classification of Zone ABC from 2014, this study focuses on municipalities located in Zone C, which have maintained their status as Zone C municipalities throughout the period from 2014 to 2022. This approach ensures consistency in the treatment group, as the eligibility criteria and geographic boundaries for the Denormandie scheme did not change for these municipalities during this time. More details in section 4.

construction vs. renovation) and project purpose (Personal use vs. Sale vs. Rental vs. Sale). This data is essential for assessing the scheme's impact on the supply side of the housing market, particularly in relation to residential renovations project, a key target of the policy.

In analyzing the Sitadel data, we construct a balanced panel at the municipal level, grouped by year. This panel structure allows us to explore both annual housing market dynamics and the longer-term effects of the Denormandie scheme on real estate supply. We construct a balanced panel (assigning a value of zero if no permits were issued in a given year), allowing for a detailed examination of how the policy influenced renovation activity across treated and non-treated areas.

Spatial Data and Geolocation Precision - A central component of this study involves the use of geospatial data to measure the proximity of real estate transactions and building permits to municipalities eligible for the Denormandie scheme. Enhanced geospatial tools allow us to assign precise GPS coordinates to each transaction and building permit. This approach allows for the estimation of the causal impact of the policy by comparing treated and non-treated areas based on their proximity to policy boundaries.

One challenge associated with the Sitadel datasets is incomplete information for some building permits, particularly regarding geolocation data. Approximately 53% of building permits have precise geolocation information (Table 9). To mitigate potential biases resulting from missing data, we adopt a two-step approach. First, the main analysis is conducted using permits with complete geolocation data. Second, we conduct robustness checks using the full sample, thus ensuring the validity of our findings.

By integrating real estate transaction data from DV3F and building permit data from Sitadel, we are able to comprehensively evaluate the effects of the Denormandie scheme on both housing demand and supply. This combined dataset offers a robust foundation for assessing the policy's impact on housing market dynamics in medium-sized municipalities across France.

4 Empirical Framework

To estimate the causal impact of the Denormandie scheme on housing outcomes, we employ a spatial difference-in-differences (DiD) approach. This methodology leverages spatial discontinuities created by the policy, allowing us to compare housing outcomes in municipalities eligible for tax incentives (treatment group) with neighboring ineligible municipalities (control group). This approach, inspired by Overman and Einio (2012) and Chapelle et al. (2018) Overman and Einio 2012; Chapelle, Vignolles, and G. Wolf 2018, is particularly suited for evaluating place-based policies with spatial spillover concerns. Our analysis focuses on housing prices, transaction volumes, and renovation activities, accounting for potential spillover effects between treated and control areas.

4.1 Identification Strategy

The identification strategy relies on two primary components. First, we restrict our analysis to municipalities exclusively affected by the Denormandie scheme, excluding those eligible for broader housing policies targeting both renovation and new construction. Specifically, we focus on municipalities classified as Zone C in France's housing tax incentive zoning system,[7] ensuring that observed changes in housing outcomes can be attributed to the scheme rather than other concurrent policies.

Second, we select neighboring Zone C municipalities not eligible for the scheme as control groups, ensuring geographic proximity and similarity in economic conditions to enhance the plausibility of the parallel trends assumption. The credibility of the DiD approach rests on the assumption that, in the absence of the policy, treated and control areas would have followed parallel trends in housing outcomes. By using neighboring municipalities as controls, we increase the likelihood of this assumption holding, thus attributing post-policy differences

[7] France's zoning system divides municipalities into four zones (A, A bis, B1, B2, and C) based on housing market conditions, where Zone C represents areas with low real estate pressure. These zones are generally excluded from incentives for new construction, which helps isolate the effect of the Denormandie scheme on renovations.

primarily to the Denormandie scheme.

An essential component of our analysis is the assessment of comparability between treated municipalities and the control group of unaffected municipalities. Table 11 presents descriptive statistics comparing key characteristics across the two groups: municipalities eligible for the Denormandie scheme and those located near the policy boundary, which serve as the control group.

Although some differences in municipality characteristics between the treated and control groups remain, Table 12 shows that the two groups are largely comparable in terms of real estate market dynamics. Additionally, as demonstrated in Table 12, restricting the sample to transactions closer to the policy boundary further improves the comparability between municipalities on either side of the boundary.

The primary model delineates the study area as a 0-5 kilometer radius around the policy boundary. Within this framework, municipalities eligible for the Denormandie scheme constitute the treated group, while municipalities outside the scheme's scope serve as the control group.[8]

The selection of the 0-5 kilometer radius is methodologically motivated to achieve two key objectives: enhancing the reliability of the results beyond the immediate boundary and preserving the validity of the parallel trends assumption, which underpins the difference-in-differences (DiD) framework. By restricting the analysis to a geographically constrained area, this design minimizes heterogeneity between treated and control groups, thereby improving the comparability of pre-treatment trends. Differences in transaction values and renovation activities observed within this radius are more likely to capture causal effects of the policy intervention rather than confounding influences or broader market dynamics.

To assess the robustness of the results to the choice of treatment radius, we systematically vary this distance within the 0-5 kilometer range in 2-kilometer increments (e.g., 1 km, 3 km, 5 km). The findings remain consistent across these variations, indicating that the observed

[8]This spatial range captures approximately 51% of building permits and 95% of transactions (see Table 9), balancing proximity to the boundary with minimizing spillover effects.

impacts persist even at greater distances from the boundary. By demonstrating stable effects across varying distances, the analysis reinforces the validity of the empirical strategy and enhances confidence in the generalizability of the findings.

Our primary model is specified as follows:

$$\log(Y_{i,t}) = \delta_t + \phi_{b(i)} + \gamma_y(Post_t \times TaxIncentive_i) + \beta X_{i,t} + \varepsilon_{i,t} \tag{1}$$

In this model, $Y_{i,t}$ represents the outcome variable at time t (e.g., transaction prices, renovation permits). The interaction term ($Post_t \times TaxIncentive_i$) captures the treatment effect, equaling 1 for municipalities impacted by the policy post-implementation. Control variables, represented by $X_{i,t}$, adjust for time-varying factors affecting all municipalities. Time fixed effects δ_t capture broader economic trends, while boundary fixed effects $\phi_{b(i)}$ account for unobservable, time-invariant characteristics specific to the boundary. For municipal-level outcomes, $\phi_{b(i)}$ represents unobserved characteristics specific to each municipality.

A key challenge is the presence of missing address data in the building permit database. Approximately 53% of permits have precise geolocation information (see Table 9). Missing data could bias results if it correlates with treatment status or other unobserved factors.[9] To address this, we employ two complementary strategies: (1) using only geolocated data with municipality fixed effects to control for spatial heterogeneity, and (2) analyzing the full sample without distance controls but with municipality fixed effects. This dual approach mitigates concerns related to missing data and enhances the robustness of our findings.

Event Study Specification for Parallel Trends Assessment – To rigorously test the parallel trends assumption, we implement an event study specification. This approach enables us to examine dynamic policy effects over time and identify any pre-treatment differences. The model is specified as follows:

[9]Municipalities with greater administrative capacity or renovation activity (likely treated areas) may report precise locations more diligently, introducing potential bias.

$$\log(Y_{i,t}) = \delta_t + \phi_{b(i)} + TaxIncentive_i \times \sum_{\substack{y=-5 \\ y\neq -1}}^{3} \gamma_y I(t - t_c^* = y) + \beta X_{i,t} + \varepsilon_{i,t} \quad (2)$$

In this model, $I(t - t_c^* = y)$ is an indicator for each time period relative to the policy start date (t_c^*), allowing us to estimate the treatment effect for each period. The omitted category is the year prior to the policy ($y = -1$), with γ_y representing the treatment effect for each period. A lack of significant pre-treatment coefficients would support the parallel trends assumption.

4.2 Addressing Potential Displacement Effects

A critical consideration when evaluating spatial policies, such as the Denormandie scheme, is the potential violation of the Stable Unit Treatment Value Assumption (SUTVA). Tax incentives can induce spillover effects, where investment is shifted from untreated areas to treated zones near the policy boundary. This redistribution, commonly referred to as displacement, complicates causal inference, as increased activity in treated zones may reflect reallocation rather than genuine new investment. To address displacement effects, we employ two complementary analyses.

First, to mitigate the influence of displacement, the analysis excludes transactions within the 1-kilometer ring surrounding the policy boundary. This exclusion follows the approach of Kline and Moretti 2014 and is motivated by two key factors. The 1-kilometer zone represents the area of greatest economic and spatial integration with treated zones. As shown in Table 12, real estate characteristics, such as transaction values and property types, are more similar within this boundary than in areas farther away, such as those located 1–3 kilometers or 1–5 kilometers from the boundary. This proximity makes the 1-kilometer zone particularly susceptible to spillover effects, where investment in treated areas may directly influence neighboring untreated zones, or vice versa. By excluding this zone, the analysis reduces the risk of contamination and enhances the robustness of the causal estimates. Furthermore,

spillover effects are expected to attenuate with distance. Beyond the 1-kilometer boundary, the study area located 1–5 kilometers away is less likely to exhibit significant displacement effects, as the spatial and economic integration with treated areas weakens.

The findings remain consistent after this exclusion across different distance variations within the 1–5 kilometer range, indicating that the observed impacts persist even at greater distances from the boundary. This robustness supports the validity of the empirical strategy and reinforces confidence in the causal interpretation of the results.

To rigorously evaluate potential displacement effects and policy spillovers in non-eligible areas, the analysis implements two complementary assessments. First, within untreated areas located in a 0–5 kilometer range from the boundary, renovation activity, transaction volumes, and price trends are compared between the 0–1 kilometer area and the remaining 1–5 kilometer area. This comparison provides insight into whether displacement effects are concentrated in zones closest to the treated areas. Second, the analysis extends to untreated areas in the 5–10 kilometer range, contrasting trends in this outer zone with those observed in the primary untreated area (0–5 kilometers). This extended comparison isolates displacement effects by capturing whether the presence of the policy incentivizes activity in areas immediately adjacent to treated zones at the expense of more distant untreated areas.

In sum, the spatial difference-in-differences approach, incorporating boundary fixed effects, robust exclusion strategies, and multi-layered spillover assessments, provides a rigorous framework for evaluating the Denormandie scheme. This approach addresses the complexities inherent in spatial policy analysis and minimizes the risk of displacement biases, enhancing the reliability of the findings.

5 Results

5.1 The Impact of Tax Incentives on Urban Housing Renovations

In this subsection, we present the results from our spatial difference-in-differences (DiD) analysis and the event study, which estimate the impact of the Denormandie tax incentives on urban housing renovations. The primary focus is on the number of building permits issued and the number of housing units renovated[10], with a particular emphasis on those issued with rental purposes, as these were the primary target of the scheme.

As discussed earlier, a key challenge in this analysis is the presence of missing geolocation data for building permits. Approximately 53.2% of the permits include precise location data (see Table 9), and the missing information could introduce bias if the excluded permits are systematically related to treatment status or renovation activities. To address this issue, we adopt two complementary approaches. First, we estimate the model using the subset of geolocated data, controlling for distance to the boundary and applying municipality fixed effects to account for unobserved heterogeneity at the municipal level. Second, we estimate an alternative specification using the full sample of permits, without distance controls, but still incorporating municipality fixed effects. This comparison allows us to test the robustness of our findings across different model specifications and to mitigate concerns related to missing data.

Table 1 reports the estimated effects of the tax incentives across varying distances from the policy boundary. The results show that the tax incentives had the largest effect in municipalities closest to the policy boundary. In the 0-1 km range, the number of building permits increased by 12%, and the number of renovated units increased by 20.8%. These effects remain statistically significant up to 5 kilometers, where similar estimates are observed.

[10]The number of housing units renovated refers to the total number of units reported as per the building permit, which may include more than one unit per permit. For instance, a single permit could account for the renovation of multiple housing units within a larger building.

Table 1: The Impact of Tax Incentives on Urban Housing Renovations

	0-1km		0-3km		0-5km	
	Number of Permits	Renovated Units	Number of Permits	Renovated Units	Number of Permits	Renovated Units
Post Tax Incentive	0.120***	0.208**	0.295***	0.492***	0.292***	0.492***
	(0.036)	(0.071)	(0.056)	(0.108)	(0.056)	(0.108)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations				1,674		
Number of Municipalities				186		
Adjusted R^2	0.46	0.42	0.47	0.44	0.47	0.44

$^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.10$

Note: This table presents results from boundary fixed-effects regressions, where the dependent variables are aggregated annually. The sample includes only building permits for existing constructions for rental purposes. The dependent variables are in the logarithm. The number of housing units renovated refers to the total number of units reported as per the building permit, which may include more than one unit per permit. Standard errors, presented in parentheses, are clustered at the municipality level.

Displacement effects - A key concern in spatial policy evaluations is the potential for displacement effects, where economic activities shift from untreated areas to treated municipalities rather than reflecting a net increase in renovations. Displacement effects may occur if tax incentives stimulate renovation activities in treated municipalities at the expense of neighboring, untreated areas, thereby misrepresenting the policy's true impact.

First, to evaluate displacement effects within treated areas, we analyze renovation activity and building permits in zones just outside the nearest boundary, specifically within the 1-5 kilometer range. The results, presented in Table 2, show a noticeable decline in renovation activities in control municipalities located farther from the boundary after excluding the immediate 0-1 kilometer ring. The coefficients, while remaining statistically significant, exhibit a reduced magnitude. For instance, the effect on the number of building permits decreased from 29.5% in the 0-3 kilometer range to 19.2% in the 1-3 kilometer ring, a pattern also observed for the number of renovated units. These findings suggest that part of the increased renovation activity within treated areas is potentially offset by reduced activity in neighboring untreated zones, indicative of localized displacement effects. However, the overall positive impact of the tax incentives remains evident beyond the immediate boundary, suggesting that the policy continues to generate net positive renovation activity despite some potential localized displacement.

Table 2: The Impact of Tax Incentives on Urban Housing Renovations - Controling for Displacement Effect

	1-3km		1-5km	
	Number of Permits	Renovated Units	Number of Permits	Renovated Units
Post Tax Incentive	0.192***	0.323***	0.190***	0.323**
	(0.052)	(0.097)	(0.052)	(0.098)
Time Fixed Effects	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes
Number of Observations			1,674	
Number of Municipalities			186	
Adjusted R^2	0.39	0.36	0.38	0.36

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Note: This table reports the results of boundary fixed-effects regressions conducted on a sample that excludes the nearest ring (0-1 km) to address potential displacement effects. Dependent variables include the logarithm of the number of building permits and renovated units for rental purposes, aggregated annually. The analysis focuses on untreated zones within 1-3 km and 1-5 km from the policy boundary. Standard errors, presented in parentheses, are clustered at the municipality level.

Second, to directly evaluate displacement effects in untreated municipalities, we analyze building permits and renovation activity within non-treated zones. Table 3 presents the results, with the first two columns comparing the 0–1 kilometer ring (treated area) to the remainder of the 0–5 kilometer non-treated sample. The findings indicate no statistically significant increase in building permits or renovation activity in non-treated municipalities. The coefficients for both the number of permits and renovated units are close to zero, suggesting the absence of displacement effects.

Similar results are observed when the analysis is extended to a 0–10 kilometer range, comparing the 0–5 kilometer treated area to the outer 5–10 kilometer region. Across both spatial scales, the results consistently demonstrate that the Denormandie scheme did not induce significant shifts in renovation activity or permits in adjacent non-treated municipalities, reinforcing the robustness of the policy's localized impact.

These findings suggest that the policy's effects are primarily concentrated within treated areas, with minimal immediate spillover into nearby untreated municipalities. However, the absence of short-term spillover effects does not preclude the possibility of longer-term positive externalities. Improvements in infrastructure, amenities, and housing quality within treated zones may gradually influence adjacent areas, as localized enhancements in urban

environments often require time to stimulate broader market responses (De Groot, Poot, and Smit 2009).

While this study focuses on the immediate impacts of the policy, future analyses could explore whether these localized improvements contribute to broader spatial development over longer time horizons. Such research would provide valuable insights into the policy's potential for fostering regional economic growth and enhancing market dynamics beyond the treated zones.

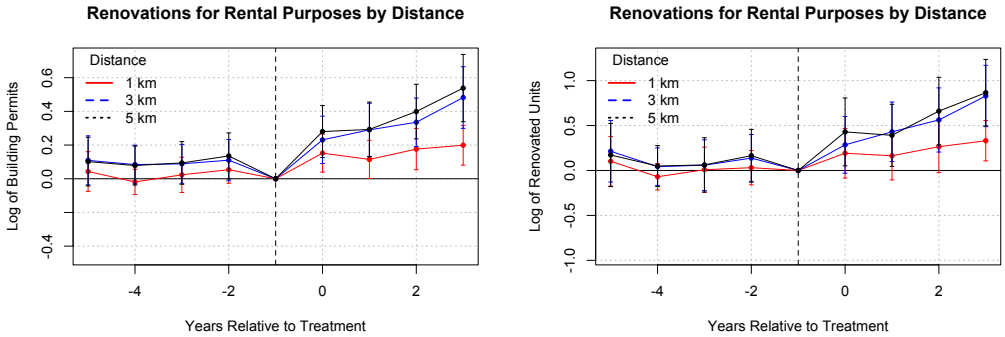
Table 3: The Impact of Tax Incentives on Urban Housing Renovations: Displacement Effects in Non-Eligible Municipalities

	Non-Eligible Municipalities			
	0-5km		0-10km	
	Number of Permits	Renovated Units	Number of Permits	Renovated Units
Post Tax Incentive	−0.002	−0.003	−0.001	−0.004
	(0.010)	(0.013)	(0.008)	(0.016)
Time Fixed Effects	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes
Number of Observations			1,224	
Number of Municipalities			136	
Adjusted R^2	0.38	0.29	0.36	0.27

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

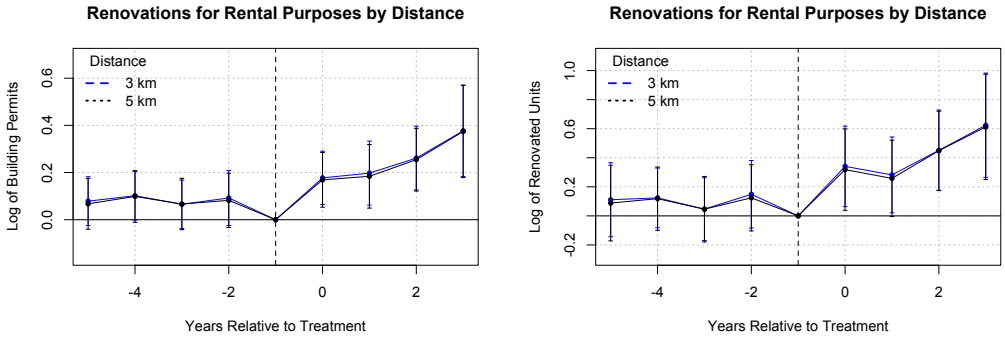
Note: This table reports the results of the displacement effects analysis conducted on non-eligible municipalities. The analysis utilizes a non-treated sample to estimate potential spillover effects. For the 0-5 km range, the treated sample includes municipalities within the 0-1 km boundary, compared to the 1-5 km boundary. For the 0-10 km range, the treated sample includes municipalities within the 0-5 km boundary, compared to the 5-10 km boundary. Dependent variables include the logarithm of the number of building permits and renovated units for rental purposes, aggregated annually. Standard errors, presented in parentheses, are clustered at the municipality level.

To further explore the temporal dynamics of the policy's effects and to test the validity of the parallel trends assumption inherent in the Difference-in-Differences (DiD) approach, we conduct an event study analysis. This method allows us to determine whether the policy's impact was immediate and sustained or transitory. The results, displayed in Figure 1, provide a detailed view of the policy's effects over time. The increase in building permits and renovations for rental purposes becomes statistically significant shortly after the policy's implementation. Importantly, the results confirm the parallel trends assumption, as the post-policy effects remain both robust and persistent over time, indicating a lasting policy impact.



(a) Permits Issued

(b) Renovated Units

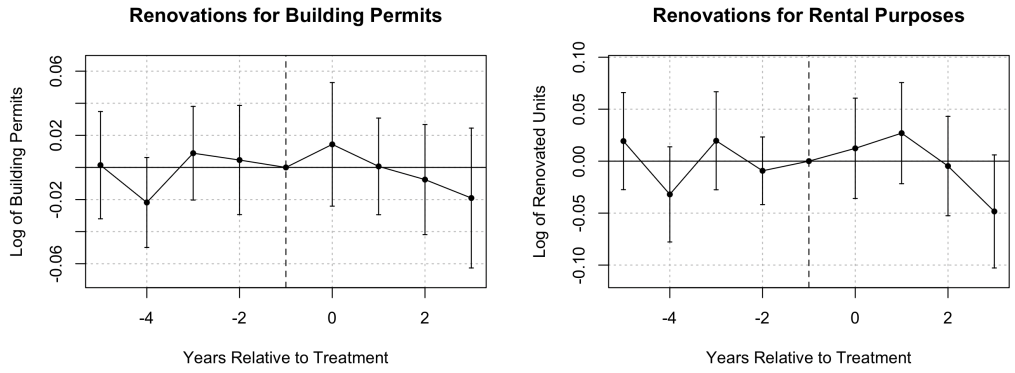


(c) Permits Issued Excluding the Nearest 1km Ring

(d) Renovated Units Excluding the Nearest 1km Ring

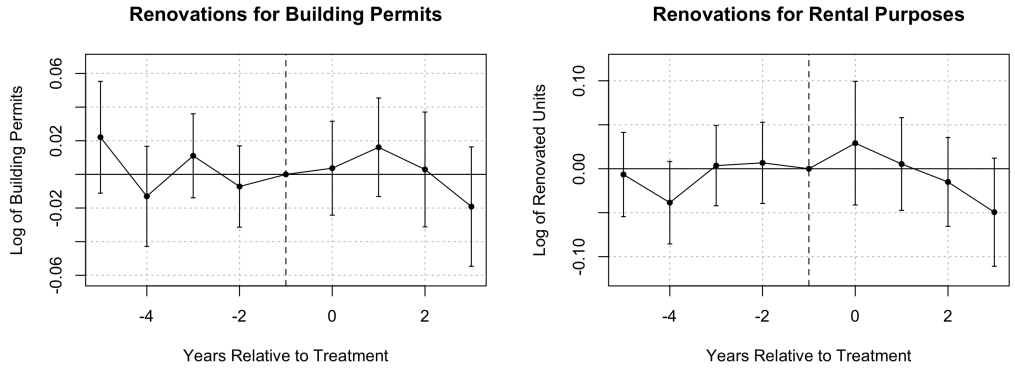
Figure 1: The Effect of Tax Incentives on Urban Housing Renovations: An Event Study Approach

The event study results illustrating displacement effects in non-eligible areas are presented in Figure 2. These findings corroborate the Difference-in-Differences (DiD) results, showing no significant impact on renovation activity. Furthermore, the results validate the parallel trends assumption, as the pre-policy effects are non-significant, while the post-policy trends remain robust and consistent over time.



(a) Permits Issued Within 0-5km

(b) Renovated Units Within 0-5km



(c) Permits Issued Within 0-10km

(d) Renovated Units Within 0-10km

Figure 2: Displacement Effects in Non-Eligible Municipalities on Urban Housing Renovations : An Event Study Approach

Alternative Sample - To ensure the robustness of our findings, we estimate an alternative specification using the full sample of building permits, controlling for unobserved heterogeneity through municipality fixed effects. Table 4 presents results consistent with those from the spatial model controlling for distance to the boundary, showing that the tax incentives are associated with a 36.5% increase in building permits and a 65.4% increase in renovated units for rental purposes.

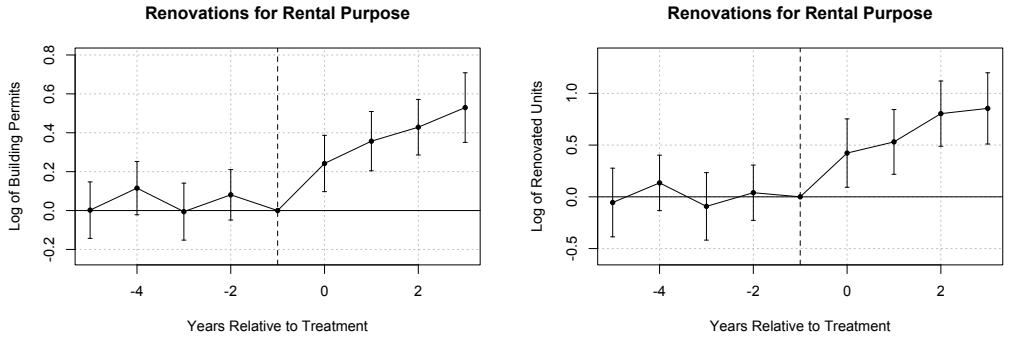
Table 4: The Impact of Tax Incentives on Urban Housing Renovations (Full Sample)

	Building Permit for Rental Purposes	
	Number of Permits	Renovated Units
Post Tax Incentive	0.365^{***}	0.654^{***}
	(0.052)	(0.105)
Time Fixed Effects	Yes	Yes
Municipality Fixed Effects	Yes	Yes
Number of Observations	5,760	
Number of Municipalities	640	
Adj. R^2	0.47	0.48

$^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.10$

Note: This table presents results from fixed-effects regressions at the municipality level, where the dependent variables are aggregated annually. The dependent variables are expressed in logarithmic. The sample includes only building permits for existing constructions. The number of housing units renovated refers to the total number of units reported as per the building permit, which may include more than one unit per permit. Standard errors, presented in parentheses, are clustered at the municipality level.

To explore the temporal pattern of the second specification and assess the validity of the parallel trends assumption in the DiD framework, we conduct an event study analysis. The event study estimates presented in Figure 3 confirm the sustained impact of the tax incentives over time. The lack of significant pre-treatment effects strongly validates the parallel trends assumption, which is crucial for the credibility of the DiD framework. The consistency of results across both specifications and the lack of pre-treatment effects in the event study reinforce the credibility of the findings. This robust replication across specifications confirms that the Denormandie tax incentives significantly increased renovation activity, particularly in the rental housing sector, demonstrating the effectiveness of the policy intervention.



(a) Permits Issued (b) Renovated Units

Figure 3: The Impact of Tax Incentives on Urban Housing Renovations (Full Sample) - Event Study

However, a limitation of this analysis is the absence of post-renovation energy efficiency data, which restricts our ability to fully assess the environmental benefits of the policy. Massié (2022), for instance, examined the effects of financial aid schemes for energy renovation in households on energy-efficient renovations and found that such incentives significantly influence homeowners' decisions to retrofit older properties Massié 2022. This suggests that similar mechanisms may be at work in the Denormandie scheme, where financial incentives could also encourage energy-efficient upgrades, although this aspect is not captured in our current dataset.

Moreover, a substantial portion of energy-inefficient and deteriorating housing stock in France, particularly in small and medium-sized municipalities, remains vacant for extended periods Desquinabo 2024. This vacancy issue undermines the attractiveness of urban centers and reduces land-use efficiency. The Denormandie scheme is well-positioned to address these broader challenges by incentivizing the renovation of older housing, particularly in underutilized urban areas. Although this study focuses primarily on renovation activities, future research should consider the scheme's potential impact on improving energy efficiency. Including post-renovation energy data would provide a more comprehensive evaluation of the scheme's environmental and urban revitalization effects.

5.2 The Impact of Tax Incentives on the Sale of Vacant Housing

This subsection evaluates the effect of the Denormandie tax incentives on the sale of vacant housing units. In medium-sized municipalities, a high portion of vacant properties typically consist of dilapidated or uninhabitable units, representing a significant share of the housing stock[11]. These properties cannot be rented or sold without substantial renovations. By analyzing the impact of the Denormandie scheme on vacant housing sales, we assess its role in revitalizing underutilized properties and contributing to urban renewal objectives.

Table 5 reports the results of the boundary fixed-effects regressions, showing a positive and statistically significant effect of the tax incentives on vacant housing sales. In the 0–1 kilometer range, the sale of vacant properties increased by 13.6% following the introduction of the tax incentives. The magnitude of this effect grows with distance from the boundary, with sales increasing by 17.2% in the 0–3 kilometer range and by 18.0% in the 0–5 kilometer range. These results indicate that the policy had a significant and sustained positive impact on vacant housing sales.

Displacement effects - To address potential displacement effects—where tax incentives may shift investment from untreated to treated areas near the boundary—we estimate an alternative specification that excludes the 1-kilometer ring adjacent to the boundary. As shown in Table 7, although the coefficients are slightly smaller after this exclusion, they remain statistically significant. Specifically, the sale of vacant properties increased by 15.2% in the 1–3 kilometer range and by 18.0% in the 1–5 kilometer range. These findings suggest that while some displacement may have occurred, the tax incentives continued to exert a positive influence on vacant housing sales beyond the immediate boundary area.

[11] Vacant units accounted for approximately 13% of the total housing stock in 2015 (see Table 11).

Table 5: The Impact of Tax Incentives on the Sale of Vacant Housing

	Full Sample			Without Nearest Ring	
	0-1km	0-3km	0-5km	1-3km	1-5km
Post Tax Incentive	0.136**	0.172***	0.181***	0.152***	0.180***
	(0.042)	(0.041)	(0.046)	(0.044)	(0.042)
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Municipality Fixed Effects	Yes	Yes	Yes	Yes	Yes
Number of Observations			5,742		
Number of Municipalities			638		
Adjusted R^2	0.85	0.86	0.86	0.85	0.85

$^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.10$

Note: This panel fixed-effects regression uses the logarithm of vacant housing units sold per year as the dependent variable. The dependent variable is expressed in logarithmic form. Standard errors, shown in parentheses, are clustered at the municipality level.

To directly evaluate displacement effects in untreated municipalities, we examine the volume of vacant housing transactions within non-treated zones. The results, presented in Table 6, provide evidence on the spatial dynamics of the policy's impact. The first column reports findings for the 0-5 kilometer range, comparing the 0-1 kilometer ring (treated area) to the 1-5 kilometer ring (control group) within non-eligible municipalities. The coefficients for the post-tax incentive period are close to zero and statistically insignificant, indicating no detectable spillover effects on vacant housing transactions in non-treated municipalities. Similarly, the second column extends the analysis to the 0-10 kilometer range, comparing the 0-5 kilometer treated area to the outer 5-10 kilometer region. Again, the coefficients are small in magnitude and statistically insignificant, reinforcing the absence of substantial spillover effects.

These findings suggest that the tax incentives under the Denormandie scheme do not induce significant displacement effects into untreated municipalities. The observed impacts of the policy are spatially concentrated within treated areas and do not appear to influence

transaction activity in adjacent non-treated zones. This localized effect underscores the targeted nature of the policy and suggests limited unintended redistribution of economic activity across municipal boundaries.

Table 6: The Impact of Tax Incentives on the Sale of Vacant Housing :Displacement Effects in Non-Eligible Municipalities

	Non-Eligible Municipalities	
	0-5km	0-10km
Post Tax Incentive	0.003	−0.018
	(0.028)	(0.025)
Time Fixed Effects	Yes	Yes
Municipality Fixed Effects	Yes	Yes
Number of Observations	5,139	
Number of Municipalities	571	
Adj. R^2	0.28	0.40

$^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.10$

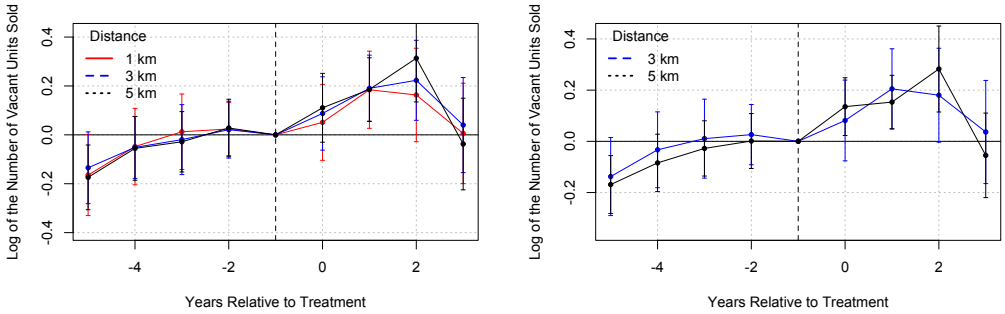
Note: This table presents results from fixed-effects regressions conducted at the municipality level, with the dependent variable being the logarithm of vacant housing units sold annually. The analysis focuses on non-eligible municipalities to estimate displacement effects. For the 0-5 km range, the comparison is made between municipalities within the 0-1 km boundary (treated sample) and those within the 1-5 km boundary (control group). For the 0-10 km range, the treated sample includes municipalities within the 0-5 km boundary, compared to those within the 5-10 km boundary. Standard errors, reported in parentheses, are clustered at the municipality level. All variables are expressed in logarithmic form, and the regressions control for both time and municipality fixed effects.

The effects of the Denormandie tax incentives on vacant housing sales are both statistically significant and economically meaningful, leading to a notable increase in the sale of previously underutilized housing stock. However, it is essential to analyze the temporal dynamics of these effects to fully understand the policy's long-term implications. Figure 4 illustrates the evolution of the policy's impact over time. The results indicate that the tax incentives had a significant effect on housing sales in the first year following implementation (year 1), with the impact persisting into the second year. By the third year (year 3), however, the coefficient decreased, and the effects became statistically insignificant, suggesting

that the policy's influence may have been temporary.

One potential explanation for this diminishing impact is the constrained supply of vacant housing units eligible for the program. In the initial phase, demand for vacant units requiring substantial renovation surged as buyers sought to capitalize on the tax incentives. The policy's focus on properties in poor condition further stimulated demand. However, as the stock of eligible properties was exhausted, the program's effectiveness weakened.

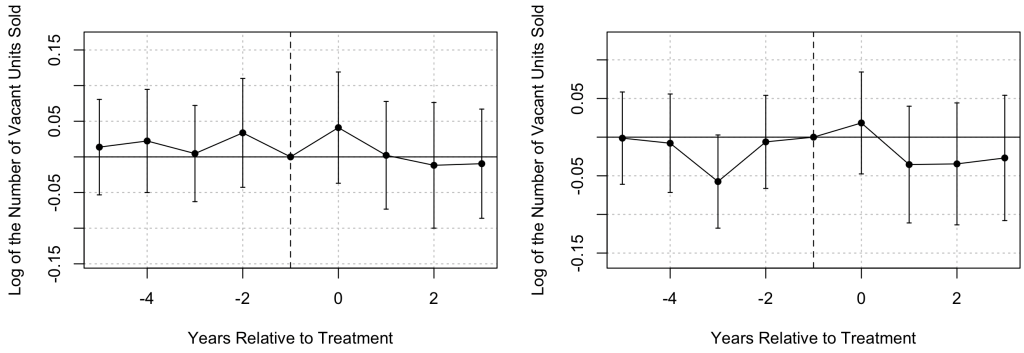
Additionally, the tax incentives likely motivated property owners to list their vacant units in anticipation of increased buyer demand. This combination of heightened demand and newly listed properties contributed to the substantial rise in vacant housing sales during the policy's first two years.



(a) Different Distance to Boundary (b) Without the Nearest Ring

Figure 4: The Impact of Tax Incentives on the Sale of Vacant Housing

The event study results illustrating displacement effects in non-eligible areas are presented in Figure 5. These findings provide further evidence supporting the Difference-in-Differences (DiD) results. Specifically, the event study reveals no statistically significant impact on vacant housing transactions in non-eligible municipalities, reinforcing the conclusion that spillover effects into untreated areas are minimal. Importantly, the event study results validate the parallel trends assumption, a critical requirement for the robustness of the DiD approach.



(a) Within 0-5km (b) Within 0-5km

Figure 5: Displacement Effects in Non-Eligible Municipalities on the Sale of Vacant Housing : An Event Study Approach

In conclusion, the Denormandie tax incentives had a clear positive impact on the sale of vacant housing units, particularly in the early stages of the program. However, the long-term sustainability of these effects may be limited.

The long-term effectiveness of the Denormandie tax incentives in medium-sized municipalities is likely constrained by the limited stock of vacant or dilapidated housing units that qualify for the program. Unlike larger urban centers, medium-sized municipalities have fewer eligible properties, and as the program progresses and these units are renovated and sold, the policy's overall impact may weaken.

While this section has primarily focused on the tax incentives' effect on vacant unit sales volumes, the increase in available properties on the market may also influence housing prices, particularly within the older housing stock segment. These potential price dynamics will be discussed in the following subsection.

5.3 The Impact of Tax Incentives on Old Housing Prices

This subsection evaluates the impact of the Denormandie tax incentives on old housing prices, shedding light on the broader market effects of the policy in targeted areas. Given that the scheme specifically targets dilapidated properties, understanding its influence on

prices in the older housing segment is crucial for assessing its economic implications.

Table 7 presents the boundary fixed-effects regression results, which indicate a negative and statistically significant impact of the tax incentives on old housing prices. Prices decreased by 2.3% in the 0-1 km range, with similar reductions observed in the 0-3 km (2.1%) and 0-5 km (2.0%) ranges. These findings suggest a localized price reduction, particularly near the policy boundary.

Displacement effects - To assess potential displacement effects, we estimated an alternative model excluding the nearest control ring (1 km). The results remained statistically significant, with consistent price reductions across the 1-3 km and 1-5 km ranges. This suggests that the observed price effects reflect broader market adjustments rather than being solely driven by displacement effects near the boundary.

As discussed earlier, the Denormandie tax incentives triggered a significant increase in the sale of vacant housing units, primarily targeting dilapidated properties. This surge in sales likely contributed to the observed temporary price reductions in the older housing segment, as the inflow of renovated properties temporarily exceeded demand, suppressing prices.

Table 7: Impact of Tax Incentives on Old Housing Prices

	Full Sample				Without Nearest Ring	
	0-1km	0-3km	0-5km		1-3km	1-5km
Post Tax Incentive	-0.023^{**}	-0.021^{**}	-0.020^{**}	-0.021^{***}	-0.022^{**}	-0.020^{**}
	(0.009)	(0.007)	(0.007)	(0.006)	(0.008)	(0.008)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Boundary Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	76,655	154,855	168,792	177,672	78,200	92,137
Number of Municipalities	535	624	624	640	598	613
Adjusted R^2	0.55	0.53	0.53	0.52	0.55	0.54

$^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.10$

The dependent variable in this boundary fixed-effects regression is the logarithm of housing prices for older constructions. Control variables include surface area, number of main rooms, bedrooms, bathrooms, kitchens, dependencies, floor level, number of floors in the building, age of the building, distance to the nearest train station, distance to the urban center and distance to the border. Standard errors, shown in parentheses, are clustered at the municipality level.

To evaluate displacement effects on housing prices in non-eligible municipalities, we analyze changes in the prices of older constructions within non-treated zones. The results, presented in Table 8, show no significant impact. In the 0-5 kilometer range, the coefficient for the post-tax incentive period is small and statistically insignificant, indicating no measurable effect. Similarly, in the 0-10 kilometer range, the coefficient is also small and statistically insignificant.

These findings suggest that the effects of the tax incentives under the Denormandie scheme are spatially concentrated within treated areas, with no evidence of spillover effects on housing prices in neighboring non-eligible zones. However, the impact on prices may take time to materialize, as housing markets often respond to policy changes with a lag. This localized impact highlights the targeted nature of the policy and minimal redistribution across municipal boundaries.

Table 8: Impact of Tax Incentives on Old Housing Prices : Displacement Effects in Non-Eligible Municipalities

	Non-Eligible Municipalities	
	0-5km	0-10km
Post Tax Incentive	0.001	0.005
	(0.009)	(0.011)
Time Fixed Effects	Yes	Yes
Municipality Fixed Effects	Yes	Yes
Number of Observations	112,402	113,969
Number of Municipalities	555	571
Adj. R^2	0.50	0.48

$^{***}p < 0.001$; $^{**}p < 0.05$; $^{*}p < 0.10$

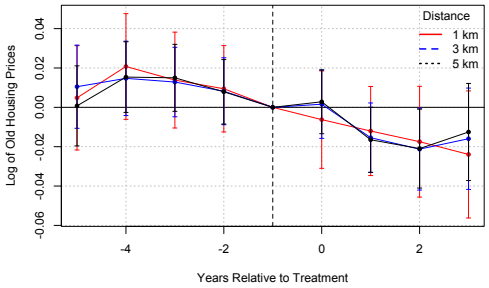
Note: This table presents results from fixed-effects regressions conducted at the municipality level. The dependent variable in this boundary fixed-effects regression is the logarithm of housing prices for older constructions. Control variables include property characteristics such as surface area, number of main rooms, bedrooms, bathrooms, kitchens, dependencies, floor level, number of floors in the building, and age of the building. Additionally, locational characteristics such as distance to the nearest train station, urban center, and the municipal boundary are included. The analysis focuses on non-eligible municipalities to estimate displacement effects. For the 0-5 km range, the comparison is made between municipalities within the 0-1 km boundary (treated sample) and those within the 1-5 km boundary (control group). For the 0-10 km range, the treated sample includes municipalities within the 0-5 km boundary, compared to those within the 5-10 km boundary. Standard errors, reported in parentheses, are clustered at the municipality level.

The event study analysis presented in Figure 6 provides detailed insights into the temporal dynamics of these price effects. The absence of significant pre-treatment effects supports the validity of the parallel trends assumption, thereby ensuring robust causal identification. Price reductions became statistically significant in the first year (year 1) following the introduction of the Denormandie scheme and persisted into the second year (year 2). By the third year (year 3), however, these price effects dissipated, with coefficient estimates becoming statistically insignificant, suggesting a potential market adjustment. This temporal pattern closely mirrors the dynamics of vacant housing sales shown in Figure 4, where the temporary increase in the supply of vacant and dilapidated properties likely intensified competition among sellers, contributing to the observed price declines.

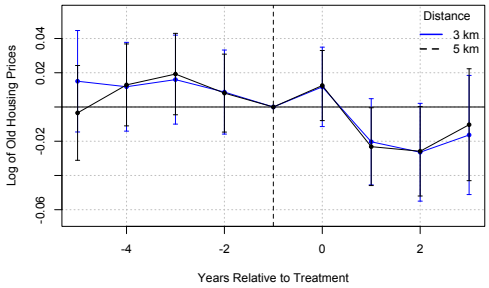
The observed price reductions in the older housing segment are consistent with a supply-side adjustment driven by the scheme's incentives. By encouraging property owners to renovate and list previously vacant units, the Denormandie scheme triggered a surge in the supply of available housing. This sudden influx of renovated and vacant units exceeded short-term demand, creating a temporary imbalance that suppressed prices in the older housing segment. Over time, as the market absorbed the additional supply, prices stabilized, consistent with the observed dissipation of effects within two years.

These findings highlight the importance of spatial and temporal dynamics in evaluating the impacts of place-based housing policies. They suggest that the Denormandie scheme's effectiveness in mobilizing underutilized housing stock came with short-term market adjustments that temporarily reduced property values in nearby areas. This underscores the need to account for supply-side pressures when assessing the broader implications of targeted housing incentives.

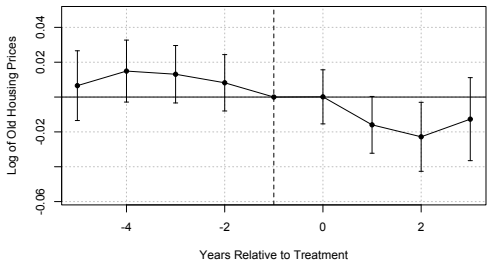
However, this pattern was not uniform across all distances from the policy boundary. In the nearest ring (0-1km), the coefficients became negative but remained statistically insignificant, possibly reflecting a displacement effect. This suggests that demand was partially shifted to areas closer to the policy boundary, where buyers sought to benefit from the scheme's incentives. As a result, the displacement effect may have mitigated the price decreases in the nearest control ring by sustaining demand and limiting downward pressure on prices in that area.



(a) Different Distance to Boundary



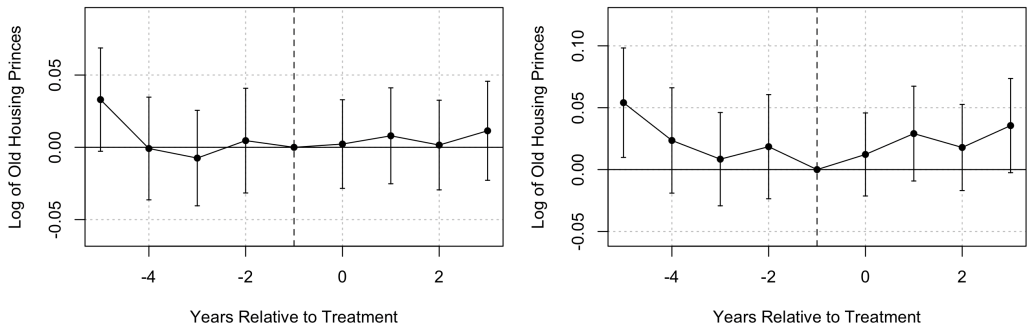
(b) Without the Nearest Ring



(c) Full Sample

Figure 6: Impact of Tax Incentives on Old Housing Prices

The event study results illustrating displacement effects in non-eligible areas are presented in Figure 7. These findings provide further evidence supporting the Difference-in-Differences (DiD) results suggesting an absence of significant impact.



(a) Within 0-5km (b) Within 0-10km

Figure 7: Impact of Tax Incentives on Old Housing Prices : Displacement Effects in Non-Eligible Municipalities

Another potential explanation lies in the broader context of the Denormandie scheme, integrated within the Action Cœur de Ville (ACV) initiative, which provides additional insight into the short-term negative price impacts. While renovation activities may have introduced temporary challenges, such as construction disruptions and potential short-term externalities, the long-term objective of urban revitalization aims to enhance the economic prospects of the targeted municipalities. As housing quality improves and public infrastructure is upgraded, demand for housing in these urban cores is expected to increase, with corresponding upward pressure on housing prices in the longer term.

In conclusion, while the short-term effects of the Denormandie scheme led to observable price reductions, the long-term potential for price appreciation remains plausible as the market adjusts to the improved housing stock and enhanced urban infrastructure. Future research should extend the time horizon of the analysis to capture the full effects of the policy, particularly as the dynamics of housing demand and supply evolve in response to the comprehensive urban regeneration efforts. A more detailed examination of the long-term impacts, incorporating broader economic variables and urban policy developments, will be essential for fully understanding the efficacy of the Denormandie scheme.

6 Conclusion and Discussion

6.1 Discussion on Mechanisms

The results of this study provide compelling evidence that the Denormandie tax incentives have significantly stimulated urban housing renovations and the sale of vacant properties in treated municipalities. The mechanisms underlying these effects, however, warrant closer examination to fully understand the policy's impact and its broader implications.

First, the increase in building permits and renovation activity suggests that the financial incentives effectively reduced barriers to entry for investors and property owners targeting dilapidated housing in the targeted area. By subsidizing renovation costs, the policy likely improved the financial viability of investing in older housing stock, particularly in medium-sized municipalities where underutilized properties represent a substantial portion of the housing market.

Second, the observed reductions in old housing prices may reflect short-term adjustments in supply and demand dynamics. The increase in the volume of vacant housing sales and the resulting inflow of dilapidated properties may have temporarily suppressed prices in the older housing segment, as supply outpaced demand. This transitory phase aligns with findings in urban renewal literature, where temporary trends often precede long-term market stabilization and appreciation as improved housing stock and enhanced urban infrastructure create new demand over time (DeGiovanni 1983; Glaeser and Gyourko 2005).

Third, the limited evidence of displacement effects in untreated municipalities indicates that the policy's impacts were largely localized, with minimal unintended redistribution of economic activity. This highlights the targeted nature of the Denormandie scheme, which appears to have succeeded in revitalizing treated areas without significantly detracting from adjacent non-treated zones.

Finally, the potential for positive externalities, such as improvements in local infrastructure and urban attractiveness, remains an important area for further exploration. While

these benefits may not materialize immediately, they could enhance housing market dynamics and economic activity in treated and neighboring areas over a longer horizon. Future studies should investigate the spillover effects and the broader urban development impacts of the scheme.

6.2 Conclusion

This paper demonstrates that the Denormandie tax incentives significantly increased renovation activity, vacant housing sales, and building permits in treated municipalities. While short-term price reductions were observed, they likely reflect temporary market adjustments rather than permanent declines in property values.

The absence of significant spillover or displacement effects into untreated areas further underscores the policy's effectiveness in targeting its intended zones. However, the sustainability of these effects may be constrained by the limited stock of eligible properties in medium-sized municipalities. As the pool of dilapidated and vacant properties diminishes, the policy's capacity to stimulate further activity may weaken.

In the long term, the Denormandie scheme has the potential to catalyze broader urban regeneration by improving housing quality and infrastructure in underutilized areas. To fully understand its impact, future research should extend the time horizon of analysis and incorporate additional data on energy efficiency and urban development outcomes. By capturing these dimensions, policymakers can better assess the scheme's contributions to sustainable urban revitalization.

Tables

Table 9: Descriptive Statistics for Eligible and Not Eligible Groups by Distance - Building Permits

	Eligible	**Not Eligible**	**Total**
0-1 km	285	75	360
0-2 km	524	140	664
0-3 km	613	190	803
0-4 km	630	216	846
0-5 km	630	227	857
0-6 km	633	229	862
0-7 km	637	232	869
0-8 km	639	234	873
0-9 km	639	235	874
0-10 km	639	240	879
Total Including Exact Locations	650	244	894
Percentage Including Exact Locations	57.8%	43.7%	53.2%
Total in Full Sample	1,124	558	1,682

Note: The values refer to the number of building permits present in each ring from 2014 to 2022.

Table 10: Descriptive Statistics for Eligible and Not Eligible Groups by Distance - Residential Transaction

	Eligible	**Not Eligible**	**Total**
0-1 km	22,624	55,859	78,483
0-2 km	38,583	96,237	134,820
0-3 km	48,417	110,319	158,736
0-4 km	54,640	113,403	168,043
0-5 km	58,441	114,401	172,842
0-6 km	60,879	114,633	175,512
0-7 km	62,544	114,782	177,326
0-8 km	63,614	114,866	178,480
0-9 km	64,485	114,899	179,384
0-10 km	65,274	114,905	180,179

Note: The values refer to the number of transactions present in each ring from 2014 to 2022.

Table 11: Comparative Statistics between Eligible and Not Eligible Groups (2015)

	Eligible in Zone C	**Zone C at the Frontier**	
	Mean	**Difference in Mean**	**t-stat**
Population	15,817	14,525	22.49
Male Population	7,424	6,789	22.69
Female Population	8,393	7,736	22.24
Population 15 years or older	13,368	12,306	22.52
Households	7,787	7,234	21.76
Population 15 years or older Married	5,286	4,732	21.57
Housing	9,211	8,568	22.09
Primary Residences	7,788	7,235	21.77
Secondary Residences	263	224	9.99
Vacant Dwellings	1,161	1,109	20.42
Houses	4,419	3,839	16.91
Apartments	4,722	4,662	16.27
Main Residence with 1 Room	399	393	13.67
Main Residence with 2 Rooms	1,084	1,060	18.66
Main Residence with 3 Rooms	1,914	1,837	19.10
Main Residence with 4 Rooms	2,124	1,963	20.54
Main Residence with 5 Rooms or More	2,266	1,982	20.07
Main Residences Occupied by Owners	3,636	3,216	19.31
Main Residences Occupied by Tenants	3,995	3,873	19.30
Main Residences HLM Rented Empty	1,666	1,633	12.83
Main Residences Free Housing	156	147	17.62
Employed Persons Aged 15 and Over	5,549	5,021	21.83
Employed Men Aged 15 and Over	2,865	2,589	22.25
Employed Women Aged 15 and Over	2,685	2,432	21.07
Unemployed Persons Aged 15-64	1,258	1,195	18.95
Retirees and Pre-retirees Aged 15-64	827	744	21.10
Number of Municipalities	69	571	

Note: The t-statistics compare the mean values for "Eligible in Zone C" with "Zone C at the Frontier." The statistics are for the year 2015.

Table 12: Comparative Statistics between Eligible and Not Eligible Groups

	Full Sample			0-1km			0-3km			0-5km		
	Mean Difference	t-stat	p-value	Mean Difference	t-stat	p-value	Mean Difference	t-stat	p-value	Mean Difference	t-stat	p-value
Real Estate Transaction												
Transaction Value	17,439.41	5.63	0.00	4,741.46	0.57	0.57	57,168.90	1.41	0.16	16,966.84	5.47	0.00
Number of 1-Room Houses	0.01	5.39	0.00	0.01	0.96	0.34	0.00	1.41	0.16	0.01	5.03	0.00
Number of 2-Room Houses	0.03	7.82	0.00	0.03	2.73	0.01	0.03	3.74	0.00	0.03	7.42	0.00
Number of 3-Room Houses	0.06	7.54	0.00	-0.01	-0.31	0.76	0.03	2.78	0.01	0.06	7.44	0.00
Number of 4-Room Houses	0.11	9.22	0.00	-0.03	-0.42	0.68	0.05	2.33	0.02	0.11	8.97	0.00
Number of 5-Room Houses	0.11	11.14	0.00	0.05	1.51	0.13	0.08	5.01	0.00	0.12	11.28	0.00
Total Built Area (m^2)	-1.08	-0.19	0.85	-14.28	-0.89	0.38	103.93	0.98	0.33	-0.04	-0.01	0.99
Number of Commercial Buildings Sold	-0.05	-9.49	0.00	-0.03	-1.27	0.21	0.07	0.67	0.50	-0.05	-8.99	0.00
Number of Residential Buildings Sold	-0.57	-16.53	0.00	-0.39	-3.25	0.00	-0.40	-7.78	0.00	-0.58	-16.73	0.00
Number of Unit Sold	-0.54	-13.91	0.00	-0.58	-2.66	0.01	-0.31	-2.10	0.04	-0.55	-13.95	0.00
Number of Recent Unit Sold (year<5 years)	0.00	1.43	0.16	-0.01	-0.39	0.69	-0.00	-0.23	0.81	0.01	1.49	0.13
Commercial Building Floor Area (m^2)	-5.13	-0.99	0.32	-4.88	-0.49	0.62	99.51	0.95	0.34	-3.96	-0.72	0.47
House Floor Area (m^2)	39.43	15.96	0.00	15.71	1.74	0.10	29.89	8.33	0.00	39.53	15.98	0.00
Distance to City Center (km)	1.17	0.33	0.74	0.07	0.02	0.98	-1.29	-0.37	0.71	1.15	0.32	0.75
Distance to Nearest Train Station (km)	16.87	0.85	0.40	20.15	0.98	0.33	22.47	1.11	0.27	16.48	0.83	0.41
Building Permits												
Commercial Space Created (m^2)	-8.86	-1.69	0.10	-3.03	-1.00	0.33	-9.19	-0.81	0.42	-9.91	-0.90	0.37
Residential Space Created (m^2)	-9.32	-0.89	0.37	29.56	1.95	0.06	12.34	0.95	0.34	7.93	0.64	0.52
Commercial Space Demolished (m^2)	-6.26	-1.72	0.10	3.59	0.37	0.71	-10.31	-1.13	0.26	-11.89	-1.34	0.19
Residential Space Demolished (m^2)	-0.64	-4.38	0.00	1.40	0.24	0.82	3.95	0.84	0.40	2.36	0.59	0.56
Residential Space Transformed (m^2)	-16.48	-2.38	0.06	-37.48	-1.92	0.07	-37.98	-2.85	0.01	-41.90	-3.21	0.00
Residential Space from Transformations (m^2)	-56.67	-6.08	0.00	-33.51	-0.84	0.41	-93.84	-3.64	0.00	-94.21	-3.76	0.00
Commercial Space from Transformations (m^2)	-7.14	-1.93	0.06	-4.11	-1.67	0.11	-13.32	-1.43	0.16	-13.54	-1.46	0.15
Total Number of Units Created	-1.02	-6.03	0.00	-0.29	-0.68	0.51	-1.03	-3.53	0.00	-1.04	-3.64	0.00
Number of Social Housing Units Created	-0.16	-2.23	0.03	-0.08	-1.34	0.20	-0.16	-2.20	0.03	-0.16	-2.20	0.03
Number of Housing Units Demolished	-0.00	-0.28	0.78	-0.02	-1.00	0.33	-0.01	-1.69	0.10	-0.01	-1.69	0.10

Note:The t-statistics and p-values refer to the differences in means between ineligible and eligible groups for each variable by distance ring. The values are based on transactions and building permits from 2014 to 2018, excluding building permits issued for personal use.

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Appendix

The *Action Cœur de Ville* Initiative

The *Action Cœur de Ville* initiative is a comprehensive urban revitalization program launched by the French government in December 2017. Its primary objective is to address the economic and social decline of medium-sized municipalities , which have suffered from population loss, economic stagnation, and deteriorating infrastructure. The program is designed to revitalize urban centers (*cœurs de ville*) and make these municipalities more attractive for residents and businesses alike.

The initiative has four main goals. First, it aims to improve the housing stock by promoting the rehabilitation of deteriorating buildings. This effort is focused on increasing the supply of affordable housing and attracting new residents to city centers while improving living conditions for existing populations. Second, it seeks to boost economic activity by supporting local businesses and enhancing commercial areas in urban centers. This is intended to stimulate the local economy, attract new enterprises, and foster a more vibrant business environment. Third, the initiative focuses on revitalizing urban infrastructure by modernizing transportation networks, public spaces, and cultural venues. Improved mobility, connectivity, and public amenities are key to making these municipalities more livable and attractive to residents and tourists. Finally, the initiative seeks to enhance public services, such as healthcare, education, and administrative functions, ensuring that the targeted municipalities offer the necessary infrastructure for everyday life.

The program targets medium-sized municipalities with populations generally ranging from 10,000 to 100,000, which face significant economic and demographic challenges. By the end of 2019, 222 municipalities had been selected to participate. These municipalities were chosen based on criteria such as population decline, urban decay, and the potential for urban renewal. Local authorities are responsible for the implementation of projects, and their involvement ensures that the specific needs of each municipality are addressed.

The *Action Cœur de Ville* initiative is supported by substantial financial backing, with over 5 billion euros allocated for the period between 2018 and 2024. This funding comes from a combination of public and private resources, including contributions from the French government, local municipalities, financial institutions such as the *Caisse des Dépôts et Consignations*, and private sector partners. The initiative relies heavily on partnerships between local governments and private investors, and these collaborations are essential for the success of the urban renewal efforts.

The key components of the initiative focus on housing rehabilitation, economic revitalization, improved accessibility, and the modernization of public spaces and services. Housing rehabilitation is central to the program, with a significant portion of funding allocated to renovating existing buildings, particularly in areas where the housing stock has fallen into disrepair. Economic revitalization is pursued by attracting businesses back into city centers, including retail, services, and other commercial enterprises that can reinvigorate local economies. Accessibility is improved through investments in transportation infrastructure, parking facilities, and pedestrian areas, ensuring better connections between urban cores and surrounding areas. Finally, the modernization of public spaces and services includes renovating public squares, parks, cultural sites, and administrative buildings, making these areas more functional and appealing to residents and visitors.

The expected outcomes of the *Action Cœur de Ville* initiative are multifaceted. First, the program aims to increase population retention and attract new residents to the revitalized urban cores. By improving housing quality and availability, the initiative seeks to create more livable and affordable municipality centers. Second, it aims to stimulate local economic growth by encouraging business activity in areas that have experienced economic decline. Third, the initiative is expected to enhance the overall attractiveness of these municipalities , improving the quality of public spaces and services and making them more appealing for residents and tourists. Ultimately, the goal of the *Action Cœur de Ville* initiative is to create vibrant, economically sustainable municipality centers that can serve as models for balanced urban development across France.

In summary, the *Action Cœur de Ville* initiative plays a crucial role in France's strategy to promote balanced territorial development by focusing on municipalities that have been economically and demographically disadvantaged. By addressing the specific challenges faced by these medium-sized municipalities , the initiative seeks to create vibrant urban centers that are economically, socially, and culturally sustainable for the long term.

Table 13: Rent Caps by Zone (2024)

	Rent Cap (€/m²)
Zone A bis	18,89
Zone A	14,03
Zone B1	11,31
Zone B2 / C	9,83

Note: The zoning system (A bis, A, B1, B2/C) categorizes areas in France based on housing market tension.