Knocking it Down and Mixing it Up:
The Impact of Public Housing Regenerations*

Hector Blanco†　　　　　　Lorenzo Neri‡
MIT　　　　　　*University of St. Andrews*

November 5, 2021

Abstract

This paper studies the effects of regenerating public housing into mixed-income communities on the local housing market. We exploit a wave of public housing regenerations in London that not only demolish and rebuild existing public housing but also almost double the number of units on-site with new market-rate units. Over a six-year period, we estimate that regenerations significantly raise nearby house prices and rents, although house prices decrease slightly farther away. We also find that they attract higher-income households, increase positive amenities (e.g., cafés, restaurants), and reduce negative amenities (e.g., crime). The results are consistent with strong demand effects concentrated near the buildings and moderate effects from increased supply that persist in the broader area. We provide suggestive evidence that changes in a neighborhood's socioeconomic composition are important to explain price effects: regenerations in low-income areas and those adding a large number of market-rate units lead to larger price increases. Overall, our findings indicate that mixed-income housing can revitalize neighborhoods near decaying public housing, but the supply of new market-rate units can increase unaffordability in low-income neighborhoods.

1 Introduction

Over the past few decades, traditional public housing developments in countries like the United States and the United Kingdom have been demolished and replaced with mixed-income housing, i.e. a combination of affordable and market-rate units in the same building.[1] Public housing high-rises generated negative effects on nearby houses such as poverty clusters, high crime rates and low housing values. While prior research has examined the effects of public housing demolitions on affected neighborhoods (Aliprantis and Hartley, 2015; Sandler, 2016; Tach and Emory, 2017; Blanco, 2021), there has been little focus on their redevelopment as mixed-income housing. In this case, the effects on local housing markets are ambiguous: while an increase in market-rate supply on-site can decrease local housing prices, demand effects from improved amenities can raise them. Moreover, concerns about gentrification and displacement of local residents are especially relevant in such low-income neighborhoods.[2]

In this paper, we study the effects of regenerating decaying public housing into mixed-income developments on local housing markets. We exploit the demolition and redevelopment of over 130 public housing *estates* (akin to US projects) between 2004 and 2018 in London, UK that approximately maintain the amount of public housing and add a similar number of market-rate units on-site. This context is particularly well-suited to answer two questions. First, can mixed-income housing prevent traditional public housing's negative effects even when preserving the number of public units? Second, what are the local effects of increasing market-rate supply in low-income areas?

Despite the fact that almost a fourth of households live in one of its units, London's public housing has faced similar challenges to those of distressed projects in the United States. We focus on a set of large public housing developments that were mostly built between 1950 and 1980, when the public sector supplied a significant amount of new affordable housing. From the 1980s, gradual

---

[1] Vale and Freemark (2012), Goetz (2012) and Fraser, Oakley and Levy (2013) provide a detailed description of this policy shift. Since the 1990s, the public housing stock in the United States has been reduced by about 300,000 units, while affordable units in subsidized private mixed-income developments have increased by 1.7 million units via the Low-Income Housing Tax Credit (LIHTC) program.

[2] Guerrieri, Hartley and Hurst (2013) suggest that housing demand shocks such as urban revitalization programs can increase local housing prices in low-income areas by attracting high-income households.

disinvestment and poor maintenance led to the decay of many of these buildings –referred to as "sink estates" (Slater, 2018; Lees and White, 2020). Hence, public authorities started a wave of regeneration programs with the involvement of private developers, which led to the creation of mixed-income housing through the sale of additional units in the new buildings on the private market. In our sample, regenerations entail a large housing supply shock: about 31,000 public housing units are regenerated into 60,000 units, of which 34,000 are market-rate.

To study the impact of regenerations on the local housing market, we leverage a particularly rich set of data. We gather address-level data on the universe of real estate transactions, as well as rental listings from the UK's leading company in the online rental sector. The listings data is fairly representative of the distribution of private rents in London, in contrast to sources used in prior research that tend to overrepresent the high-end of the market or limit the study sample to apartment buildings.[3] Moreover, we construct a novel dataset by scraping online listings' descriptions in order to measure housing quality changes around regeneration.

Our main empirical strategy consists of a difference-in-differences design that defines the comparison group using variation in proximity to the estates. We assume that distance to the buildings determines treatment intensity. Hence, we compare housing units within an inner ring of a certain radius around an estate to units within an outer ring surrounding that inner ring, which serve as the comparison group. Intuitively, the only difference between units in the inner and the outer rings after controlling for observables is distance to the estate, since they belong to the same neighborhood. And, because proximity determines treatment, sufficiently far away units (i.e., in the outer ring) should not be treated. Reassuringly, an alternative specification that uses units in the inner ring of estates being regenerated later in the period as the comparison group yields remarkably similar estimates, which suggests that spillovers on the outer ring are negligible.

Following this method, we estimate that public housing regenerations significantly raise nearby house prices and rents, but moderately decrease house prices in the broader area. Over a six-year period, we find that house prices rise up to 6% within 100m of a regenerated estate and drop by

---

[3]E.g., Asquith, Mast and Reed (2021) find that Zillow rents are a 20% higher than estimates from the American Community Survey for low-income areas.

2-3% for housing units within 300-600m. Rents increase by 8% within 100m and up to 2% as far as 400m away from regenerated sites –we do not observe rent reductions at any distance. Moreover, the number of sales and listings of old units, as well as new market-rate construction, increases very close to the buildings, pointing to the growing attractiveness of these areas. Interestingly, we also find that landlords in the broader area upgrade the quality of their rental units to compete with market-rate housing in the new buildings, e.g., through refurbishment and renovation. Overall, these findings are consistent with strong demand effects very close to the buildings –leading to observed price increases–, and moderate supply effects that dominate farther away only in the sales market –explaining the negative result.

To explore the mechanisms behind these results, we collect additional data on neighborhood characteristics and amenities. For the former, we use data on primary school-age children's subsidized lunch eligibility to track the socioeconomic status of regenerated neighborhoods. For the latter, we use the listings' descriptions dataset to study changes in advertised local amenities, such as green spaces and businesses; as well as administrative data on crime.

Using the same empirical strategy, we document strong demand effects that support nearby price increases: new mixed-income housing significantly changes neighborhood socioeconomic composition and improves local amenities. Firstly, regenerations attract higher-income households. The number of children not eligible for subsidized lunch increases by 12.5% within 200m after the regenerations, while the number of eligible children does not change –we cannot reject the null of no displacement effects for nearby low-income households in the medium-run. Regarding local amenities, we estimate that the probability of a listing advertising general amenities, cafés, restaurants and green spaces significantly jumps for nearby rental units around the time of regeneration. Improvements in local amenities are also supported by sizeable crime reductions within 200m. Taken together, these results indicate that mixed-income housing can overcome the negative effects of traditional public housing on nearby areas while preserving the public housing stock.

Lastly, we provide suggestive evidence that neighborhoods undergoing large changes in their socioeconomic composition after regenerations experience larger price increases. To show this,

4

we study the heterogeneity of our price results in two ways. First, we estimate that low-income neighborhoods account for most rent increases. Second, we find that housing price increases are considerably higher for regenerations that build relatively more market-rate housing. Since the new buildings attract richer households, these results suggest that regenerations are more likely to have the highest impact on prices in areas that considerably increase their ratio of high- to low-income households. These findings are consistent with high levels of new market-rate construction making these neighborhoods less affordable by changing their socioeconomic composition.

This paper is related to several strands of literature. First, we contribute to the literature on the impact of public housing on surrounding neighborhoods. Prior research focuses on the demolition of US' most problematic projects, which resulted in a large, negative supply shock and its partial replacement with mixed-income housing through private subsidies. Demolitions led to large house prices increases (9-20%) in nearby areas (Brown, 2009; Zielenbach and Voith, 2010; Blanco, 2021), as well as sizeable crime rate decreases (Aliprantis and Hartley, 2015; Sandler, 2016) and changes neighborhood socioeconomic composition (Tach and Emory, 2017). In addition, Koster and van Ommeren (2019) estimate a mild positive reaction of house prices to a public housing quality improvement in the Netherlands. This paper examines a new setting in which redevelopment resulted in mixed-income comminities by preserving the amount of public housing and expanding market-rate housing supply. Thus, the housing price increases in this paper, which are smaller than those for US demolitions, are likely mitigated by increased supply.

Second, this paper builds on the literature studying the provision of affordable housing through mixed-income developments. Previous work focuses on the Low-Income Housing Tax Credit program (LIHTC) in the US, which subsidizes affordable housing in the construction of new market-rate buildings. Diamond and McQuade (2019) show that LIHTC buildings have heterogeneous price effects that depend on neighborhood composition –poorer areas experience price increases–, while Sinai and Waldfogel (2005) and Eriksen and Rosenthal (2010) find large crowd-out effects of LIHTC on new market-rate housing supply. In our context, we study mixed-income buildings as an alternative form of supplying public housing that may alleviate its negative effects nearby.

Third, a growing body of work has recently examined the local effects of new market-rate buildings on housing prices. While most studies point to a reduction in nearby rents (Li, 2019; Asquith et al., 2021; Pennington, 2021), others find significant rent increases near new construction (Singh, 2020). Damiano and Frenier (2020) suggests that low-end units experience rent increases, while high-end units bear rent decreases. We contribute by examining how supplying market-rate units through public housing affects the local housing market in deprived areas. A potential reason for our contrasting positive price effects is that we focus on previously decaying public housing –where amenity gains are probably much larger.

Finally, our paper is also related to the literature on the consequences of public housing demolitions on displaced and local residents. The literature on demolitions in the US shows that, although displaced children do no better in the short-run, they improve their labor market outcomes in the long-run after moving to less disadvantaged neighborhoods (Jacob, 2004; Chyn, 2018; Haltiwanger, Kutzbach, Palloni, Pollakowski, Staiger and Weinberg, 2020). In the case of London's regenerations, Neri (2020) shows that children staying in the neighborhood improved their academic performance, potentially by increased exposure to a more income-diverse population. In this paper, we seek to understand how public housing regenerations change neighborhood outcomes, which may lead to increased opportunities for nearby residents.

2 Background

Although public housing had been an important source of new affordable housing in London until the 1980s, gradual disinvestment led to the decay of most of its traditional developments (known as council estates; henceforth, *estates*) by the 2000s. To address this, local authorities started a wave of public housing regenerations that resulted in new mixed-income housing by rebuilding existing public housing units and constructing additional market-rate units on-site. How these regenerations impact local housing markets is ambiguous: they increase nearby housing demand by making the area more appealing, which raises prices, but they also expand housing supply, driving prices down.

2.1 An Overview of Public Housing in London

Public housing is more common in London and the United Kingdom, more generally, than in other developed countries.[4] In 2011, there were about 786,000 public housing units in London providing affordable housing to about 24% of the 3.2 million households living in the city. Such units are subject to a range of rent levels, yet all of them are below the market price.[5] In contrast, the population share living in public housing is much lower for comparable metropolitan areas in the United States, a country that has faced similar challenges regarding large public housing developments. Some examples include New York (2.2%), Chicago (0.5%) or Atlanta (0.4%).[6]

The management of public housing is decentralized to the 33 Local Authorities in London (LAs, i.e., boroughs) and housing associations (HAs).[7] HAs are non-profit organizations, regulated and funded by the government, that cooperate with LAs in providing affordable housing –as of 2011, 45% of public housing units were managed by HAs. However, LAs set eligibility requirements for all public housing.[8] Once an individual meets the eligibility criteria, they join a waiting list and can apply for housing as properties become available. Priority is given to households with medical or welfare needs, those living in unsatisfactory conditions (e.g., overcrowding), and the homeless.

In this paper, we focus on a subset of public housing estates that had entered into a state of decay by the 2000s after gradual disinvestment by public authorities. These estates were mostly built between the 1950s and the 1980s, a period when LAs accounted for almost half of the yearly production of new housing units in England. By the early 1990s, however, this figure had dropped to

---

[4]According to the OECD, 17% of UK dwellings were social rental dwellings in 2020, compared to the 7% OECD average. The share was only higher for the Netherlands, Austria and Denmark. Social housing is defined as the rental housing stock provided at sub-market prices and allocated according to specific rules rather than market mechanisms.

[5]There are three main rent levels associated to public housing in London. The most common category is *social rent*, with a median rent of around 35% of that in the private market (Trust for London, 2020). The second category is *intermediate rent*, which includes rentals and shared-ownership housing that targets lower middle-and middle-income households. Lastly, *affordable rent* was introduced in 2011 with rents up to 80% of those in the private market. This last category accounted for a very small fraction of units in the regenerated buildings that are the focus of this paper.

[6]Based on the authors' calculations. London's number comes from the percentage of housing units classified as social housing according to the 2011 Census. For the US, public housing population was obtained from the Picture of Subsidized Households of the Department of Housing and Urban Development and total population from the Census.

[7]LAs – or 'local councils' – represent one of the local government units in England and are responsible for a range of services, such as education and housing. In London, there are 32 Local Authorities plus the City of London.

[8]Generally, any adult individual who has low income, has recognized housing needs, has lived for a certain number of years in the LA, and hasn't displayed situations of anti-social behavior or rent arrears, can apply for public housing.

below 1% –most new public housing production had been undertaken by HAs, accounting for 20% of total new construction.[9] The process of disinvestment in public housing started in 1980, when the government introduced the possibility for public housing tenants to buy their unit at a highly discounted price, i.e., the so-called *Right-to-buy* scheme (RTB). The RTB scheme considerably reduced the housing stock publicly maintained by LAs.[10] Furthermore, the government continued the cutback on public housing with the 1986 Housing and Planning Act, which allowed LAs to transfer the management of all their public housing stock to HAs. By the turn of the millenium, the ongoing decay –and a mounting need to increase housing density in major urban centres– fostered a large wave of public housing estate regenerations.

2.2 Public Housing Regenerations: towards Mixed-Income Housing

In response to the poor condition of public housing estates, LAs/HAs started a process of demolition and redevelopment ("regeneration") in the early 2000s. Before this, the word "estate" carried stigma: the press related it to crime, neglect and poverty –similarly to US projects.[11] Given the lack of investment from public authorities, some researchers even referred to the poor housing conditions and the estates' general air of disrepair as "managed decline" (Watt, 2009, 2013). Regeneration programs are seen, in the words of the Mayor of London, "as an opportunity to revitalize local communities rather than to move their residents away".[12] In fact, estates should be prioritized for regeneration based on their level of unfitness, i.e., poor design and physical conditions.

As a result, many public housing estates have been redeveloped as mixed-income communities, i.e., a combination of public and market-rate units in the new building.[13] Due to the lack of fund-

---

[9]Ministry of Housing, Communities and Local Government, "Live tables on house building", Table 244.

[10]The *Right-to-buy* scheme helps public housing tenants to buy their home by benefiting from a consistent discount. House and flat tenants can benefit from a 35% and 50% discount, respectively after they have been public sector tenants for three years. After 5 years the discount increases by 1% and 2%, respectively, up to a maximum of 70%.

[11]Some examples include: "The word 'estate' has become synonymous with the term 'ghetto'. It's become a dirty word. Back in the '20s and '30s it didn't carry the same stigma", "The Aylesbury estate became journalistic shorthand for inner-city crime, squalor and deprivation, with the Daily Mail describing a walk around its precincts as 'like visiting hell's waiting room'", "The estate has been neglected for years". *Sources*: BBC (2012), The Guardian (2010).

[12]Mayor of London, *"Better homes for local people. The mayor's good practice guide to estate regeneration"*, 2018.

[13]Appendix Fig. B.1 provides an example of a regeneration program in West London. In some instances, large regeneration programs can include the provision of new amenities for the area, such as new parks or playgrounds.

ing of LAs/HAs, regenerations are often carried out with the involvement of private developers. Hence, regeneration programs not only tend to preserve the amount of public housing originally present in the estate but also facilitate the sale of a substantial number of market-rate units in the new buildings. The details of these partnerships with private developers vary from regeneration to regeneration.[14] LAs/HAs retain the ownership of public housing units in new mixed-income buildings, although the management of these units is often transferred to a private entity. Note that the involvement of the private sector also implies that, in practice, LAs/HAs may have the incentive to prioritize estates in more "profitable" neighborhoods. In fact, public authorities are often accused of accelerating gentrification and displacing low-income households from the center of London via estate regeneration (Lees and White, 2020).[15] Despite our focus on mixed-income regenerations, a subset of small estates have been regenerated as public housing only.[16]

Regenerations take several years to complete and displaced households are generally relocated nearby, which temporarily increases housing demand nearby. After permission is granted for the regeneration, it takes on average one year to start the regeneration and about four years to complete. During regeneration, tenants were moved to alternative public or private accommodation, located either in the preferred area or one that minimizes disruption to the household's work and schooling circumstances.[17] Due to this provision, public housing tenants tended to be initially rehoused in the surrounding neighborhood.[18] Life-time tenants had the right to be offered a flat in the new premises and homeowners who bought their home through the RTB scheme were offered a price for the flat.

---

[14]The Myatts Field North estate is an example of this: "the local authority signs a contract with a private developer, which provides the upfront capital financing and subsequent management of the asset. The public sector repays the developer in monthly installments and, in residential developments, often with land and permission for private dwellings alongside the revamped social housing". *Source*: The Guardian (2017).

[15]See, e.g., "Regeneration –or pushing out the poor? Labour divides in bitter housing battle", The Guardian (2017); "The real cost of regeneration", The Guardian (2017)

[16]We focus on mixed-income housing for two reasons. First, mixed-income housing is especially policy relevant: policymakers argue that it can solve problems associated with traditional public housing. Second, estates regenerated fully as public housing are significantly smaller than those converted into mixed-income housing (77 and 248 units on average, respectively), which has several implications. One is that estates rebuilt as public housing only cannot serve as a counterfactual for mixed-income regenerations, since the two distributions of existing units do not overlap sufficiently. Another implication is that we have less statistical power due to their small size. Finally, the fact that mixed-income regenerations are larger indicates that this group reflects better the sample of estates that were in poor conditions and that are the focus of this paper. Appendix A.2 reproduces the main analysis for "public housing only" regenerations.

[17]Households who had to move also had priority when bidding for vacancies advertised by the LA.

[18]Based on the authors' calculations, 80% of tenants with children moved within 1km of the regeneration site.

2.3 Potential Demand and Supply Effects of Regenerations

Public housing regenerations can affect the local housing market through both demand and supply effects, which push prices in opposite directions. To study these effects, we treat housing units around each estate as a separate neighborhood within the city, following the previous literature (Diamond and McQuade, 2019; Asquith et al., 2021; Pennington, 2021).

On the demand side, nearby housing prices may rise if regenerations increase amenities and attract higher-income neighbors. First, redevelopment replaces run-down housing with new and higher-quality buildings, along with further beautification of the area (newly paved streets, green spaces, etc.). The old buildings' poor conditions likely depressed the values of nearby properties due to an eyesore effect. Second, households living in newly constructed market-rate units are presumably richer. Prior research suggests that households are willing to pay to live near higher-income and more educated neighbors (Bayer, Ferreira and McMillan, 2007; Guerrieri et al., 2013; Diamond, 2016). Furthermore, the deconcentration of poor households in large estates may also bring amenities to the broader neighborhood such as crime reductions and increases in local economic activity, e.g., new businesses. Taken together, demand effects should be strong very close to the estates and still be present in the broader area, but decaying with distance to the estates.

Tenant relocation is an additional demand margin that plausibly increases local housing prices in the short/medium-run. Most displaced public housing tenants are at least temporarily rehoused within 1km of the estates, a fraction of which relocates to private housing. Hence, the reduction in public housing supply shifts the local private housing demand outwards, which pushes up prices. Rents should especially reflect this increase due to the temporary nature of the shock. This feature of regenerations, i.e., the provision (in this case, temporary reduction) of public housing as a way to affect local housing prices, links to the public finance literature on the pecuniary effects of in-kind transfers (Coate, Johnson and Zeckhauser, 1994; Blanco, 2021).

On the supply side, estate regenerations shift the private housing supply curve outwards, which puts downward pressure on prices. In a simple supply and demand model, this shift implies that the marginal household's willingness to pay for living in the neighborhood is weakly lower after the

regeneration. How the magnitude of the supply effect varies with distance is uncertain. Intuitively, supply effects should be stronger for closer substitutes of newly constructed units. If housing demand is strongly driven by distance to the estate, i.e., households really care about location within the neighborhood, we expect supply effects to be highly concentrated right around the estate. If housing demand reflects preference for the neighborhood more generally, as opposed to others, supply effects should persist also for units farther away from the estate.

The net price effect is therefore *ex ante* ambiguous, and an empircal question. It also likely varies with distance to the regeneration site, since the relative impact of demand-side and supply-side factors may vary with distance. If demand effects are strong relative to supply effects, regenerations may result in nearby price increases. Singh (2020) finds rent increases within 150m of new market-rate housing in NYC. On the contrary, if supply effects are stronger, we can expect lower sale and rental prices in the neighborhood. Li (2019), Asquith et al. (2021) and Pennington (2021) estimate rent decreases up to a distance from market-rate construction going from 0.15 to 1.5km for several US metropolitan areas. A third option is that the two effects dominate at different distances. For instance, highly localized demand-side factors can lead to price increases near the building but price reductions in the broader area as the relative importance of supply effects dominates.

3 Empirical Strategy

We estimate the effects of public housing regenerations on nearby housing units using a difference-in-differences design that compares units near regenerated estates to those located farther away. To do this, we gather a rich set of data on regenerations, house sales, rental listings, and local amenities.

3.1 Data

We identify public housing regenerations from a dataset containing the universe of planning applications in London. To explore the effects on the local housing market, we collect data on real estate transactions, rental listings, and new construction. Importantly, we build a novel dataset

containing information on the quality of rental units and nearby local amenities by scraping rental listings' descriptions. Lastly, we further study neighborhood change using data on primary school-age children to track the socioeconomic status of nearby households, as well as data on crime.

Estate regenerations.   We identify all estate regenerations in London between 2004 and 2018 using administrative records from the London Development Database (LDD). The LDD contains all housing planning applications filed to the planning authorities –represented by the 33 LAs– either approved or completed since 2004. Each application contains information on the permission, start and completion dates, exact location, the number of existing/proposed units by type (i.e., public or market-rate), and the provider of existing/proposed units (LA, HA or private entity). We identify buildings belonging to a estate regeneration as applications where the existing building contains public housing units whose provider was either a LA or a HA. There are 432 such buildings.

Given that buildings belonging to the same estate may be filed under different applications, we group them as follows. Buildings are grouped into the same estate regeneration if they share the same estate name in the application, were located within 400m of each other and their planning permission was approved within six years of each other.[19] We drop estate regenerations with less than 10 units in the existing building. This process leaves a sample of 239 estate regenerations.

Finally, we define mixed-income regenerations as estates where the new buildings include a percentage of public housing units of 80% or less. Panel (a) of Fig. B.2 shows that our analysis is not sensitive to this threshold because an overwhelming majority of regenerations above the 80 percent limit are capturing estates regenerated as public housing only. In addition, panel (b) illustrates that the number of regenerations is consistently spread throughout the sample period. The final sample consists of 135 regenerations.

House sales and rental listings.   To measure house prices, we use administrative records from the UK Land Registry on all residential sales between 1998 to 2019. Every transaction records the date, price paid, unit type (detached, semi-detached, terraced, flats/maisonettes), age (newly built

---

[19]The six-year limit is guided by the time window used in our empirical strategy.

or established residential property), contract type (leasehold or freehold) and address.[20]

We complement house price data with the universe of rental listings posted between 2006 and 2019 on the website Rightmove, leader in the sector of online rental listings.[21] Every listing reports the date, rent, status (available or let agreed), house type, number of bedrooms, address and website link.[22] The dataset is fairly representative of rent levels in London: the correlation at the LA level between Rightmove rents and official estimates is 0.99. While Rightmove rents are on average 10% higher, part of this is explained because Rightmove mostly captures asking rents, as opposed to agreed rents (only 24% of the sample). In our sample, agreed rents are 5-10% lower than asking rents, which explains most of the gap. Appendix A.1.1 provides more details.

To characterize rental listings, we construct a novel dataset by scraping the ad description in the listings' websites. In the description, agents usually advertise not only details about the unit but also about the neighborhood.[23] We use descriptions to generate dummy variables indicating the presence of certain keywords that refer to characteristics of the unit (refurbished, luxury, washing machine), the building (garden, gym, concierge), and the neighborhood (amenities, cafés, restaurants, parks).[24] This dataset allows us to proxy for rental housing quality changes in response to regenerations, as well as changes in advertised amenities.

Neighborhood composition and amenities. To measure changes in local demographics, we obtained administrative records from the National Pupil Database (NPD) on primary school-age students in England from 2002 to 2016 (approximately 600k per year). We use subsidized lunch eligibility to track the socioeconomic status of households at the block group level –children are linked to regenerations using their block group of residence. Regarding amenities, we use the listings' descriptions dataset above to study effects on new businesses and green spaces. We also employ

---

[20]We geolocate houses using the latitude and longitude coordinates of the postcode. Postcodes in London are small and usually map into single buildings.

[21]As of 2021, Rightmove receives 127.5 million visits per month, while this figure stands at 50 million for Zoopla, the second leader company in the online rental sector. Source: Homeowners Alliance

[22]In the analysis, we do not include other house characteristics also present in the dataset such as floor area, number of bathrooms, and construction year, because they are missing for about two-thirds of the sample.

[23]Appendix Fig. A.3 shows an example of such a listing.

[24]See Appendix A.1.2 for a more detailed description of the construction of this dataset.

crime data at the block group level from 2008 to 2018, which is publicly available from the London Metropolitan Police website and records the number of crime offenses broken down by category (e.g., burglary, theft, violence against the person).

Geography and others. The UK geography is defined by blocks (Output Areas, OAs), block groups (Lower Layer Super Output Areas, LSOAs) and census tracts (Medium Layer Super Output Areas, MSOAs). These are geographical units created by the Office for National Statistics (ONS) for Census reporting purposes and contain an average of 130, 672 and 3,245 households in London, respectively. To construct statistics of the local areas that are targeted for a regeneration we use census data at the block level from the 2001 and 2011 UK censuses. Block-level statistics include detailed information on the population's socioeconomic and housing characteristics.

3.2 Summary Statistics

Estate regenerations almost double the total number of units in the new buildings while maintaining the amount of public housing. Columns 2-3 of Table I report the average number of units before and after regeneration by type for the full sample of regenerations and a balanced sample of 70 regenerations approved between 2004 and 2012 that we use in our main specification –both samples are similar on observables. Panel A illustrates that, on average, redeveloped buildings preserve the amount of public housing (206 units before, 197 after) and build around twice as much market-rate housing (218 units). Panel B shows that the change in market-rate units induced by regenerations is a big shock to the nearby area: it is equivalent to 41% of total housing units within 200m of the estates in 2001, and up to 3% of units within 800m. Finally, note that the average existing building contains about 17% of non-public housing units: some public housing tenants had bought their unit at a very discounted price through the RTB scheme.

Estate regenerations are also located in areas with lower socioeconomic status than the average London neighborhood (panel C). While Column 1 of Table I shows neighborhood characteristics for the average census block in London, Columns 2 and 3 do it for the full and the balanced sample of

regenerations. For this table, we define a neighborhood as blocks within 800m of the reference block –consistent with our empirical strategy below. Estate regenerations were in poorer and less educated neighborhoods than the average London neighborhood, as well as in areas with more public housing and similar housing prices. The last fact can be explained by their location: Fig. I shows that, although regenerations were spread throughout the city, more mixed-income regenerations take place in Inner London, where housing prices are higher.

3.3   Empirical Specification: Using Variation in Proximity

The main empirical challenge is the selection of a plausible comparison group that describes the counterfactual trajectory of housing prices and other neighborhood outcomes in the absence of exposure to regenerations. An ideal experiment would compare housing units near estates randomly assigned to regeneration to those near similar estates not assigned to regeneration. Unfortunately, this experiment cannot be approximated because comprehensive data on non-regenerated estates is not available. Using data on regenerated estates only, we need to address the concern that regenerated areas are endogenous, e.g., private developers might decide to partner up to regenerate estates only in the most profitable areas.

To overcome this issue, we use a difference-in-differences design that uses *variation in proximity* to the estates to define the comparison group. This approach assumes that proximity determines treatment intensity, as argued in Section 2.3. We compare housing units in an inner ring of a certain radius around a regenerated estate to units in an outer ring surrounding that inner ring, which serve as a comparison group. The identifying assumption is that, in the absence of the regeneration, the outcome of interest would have changed in parallel in both rings. Intuitively, the only difference between units in the inner and outer rings after controlling for observables is distance to the estate, since they belong to the same neighborhood. And, because proximity determines treatment intensity, sufficiently far away units (i.e., in the outer ring) should not be treated.

We implement this strategy as follows. For each regenerated estate, we keep sales and listings

of housing units within 1km.[25] We exclude housing units in newly regenerated buildings from the regressions, since our main goal is to study the effects on nearby houses.[26] Next, we construct an event year variable with respect to the permission year of the associated estate and restrict the sample to observations within 6 event years. Finally, we append all datasets. Note that some units may appear several times for different estates due to the overlapping of rings of different estates –Section 4.4 presents robustness checks where results hold even when dropping duplicated observations.

We start by interacting event year dummies from/to the regeneration event with multiple 200m rings up to 800m indicating the distance of each housing unit to the associated estate (treated rings). Housing units located between 800m and 1,000m are the omitted group (comparison ring). We estimate the following event study equation at the house h, estate e and year t level:

$$\mathbf{Y}_{het} = \alpha_{et} + \kappa_{e,r(h,e),g(h)} + \sum_{\tau=-6}^{6} \sum_{r \in R} \beta_{\tau,r} \, \mathbb{1}(t - E_e = \tau, r(h,e) = r) + \gamma' \mathbf{X_{ht}} + \epsilon_{het} \quad (1)$$

$\beta_{\tau,r}$ is the effect of interest, i.e., the evolution of housing prices over time in each treated ring with respect to the most outer ring, set to 800-1,000m. The indicator variable in the summatory interacts event years τ with dummy variables indicating the ring $r(h,e)$ in which housing unit h is located with respect to estate e. E_e denotes the year when the permission was approved for estate e, while the set of included rings r is defined as $R = \{0\text{-}200\text{m}, 200\text{-}400\text{m}, 400\text{-}600\text{m}, 600\text{-}800\text{m}\}$. We weight each estate-year equally and, within each estate-year, we weight every block equally.[27] We cluster standard errors at the estate level.

We control for neighborhood time patterns and baseline levels using a rich set of fixed effects.

---

[25]For house sales and rental listings, we only include arms-length transactions and avoid outliers. We do so by dropping the top and bottom 0.5% sale/rental price transactions each year. This gets rid of a number of outliers and drops observations with zero or extremely low sale/rental price.

[26]When house prices are the dependent variable, we exclude sales of new houses occurring in the regenerated block after permission. In the case of rents, we exclude all listings in the regenerated block after permission because we do not have a perfect proxy to determine whether a house has been newly constructed.

[27]The first choice accounts for the fact that there are more sales and listings around estates in denser areas and, without weights, these estates would have higher weights than estates in less dense areas. The second choice addresses the fact that the number of sales and listings varies across years. Thus, we also need to weight each block equally to guarantee that $\beta_{\tau,r}$ reports the same weighted average for each ring across event years. In the absence of such weighting, estates with more sales or listings in event year τ for ring r relative to the comparison ring would contribute to $\beta_{\tau,r}$ with a higher weight. Note that this weighting does not matter when the outcome are house sales or rental listings counts per block because we run the regression at the block level, the number of which is constant across years.

Estate-calendar year FE (α_{et}) flexibly account for time patterns across all rings around each estate e, while estate-ring-census tract g FE ($\kappa_{e,r(e,h),g(h)}$) control for baseline differences of units across each ring.[28] This combination of fixed effects ensures that $\beta_{\tau,r}$ captures differences in the evolution of the outcome across rings *within* each estate regeneration. Intuitively, $\beta_{\tau,r}$ is a weighted average of estate-specific treatment effects, i.e., the result of running Eq. (1) separately for each estate.

In the case of house prices, we include as control variables $\mathbf{X_{ht}}$ the unit type, tenure type, a dummy indicating whether the unit was newly constructed, month-of-sale dummies, a quadratic term for the average unit area in the postcode, census block characteristics in 2001 (density, number of households, public housing share, owner-occupied housing share), school market characteristics and a quadratic term for distance to the nearest tube station.[29] For rents, we also include the number of bedrooms and the listing status (available or let agreed). When we use outcomes at the block level, such as the number of sales, listings and newly approved units per block, we run the regression at the census block level i.[30]

We also report a pooled version of Eq. (1) that collapses post-treatment event year dummies into two periods: 0 to 3 years ($\text{Post}_{et}^{0\text{-}3}$) and 4 to 6 years ($\text{Post}_{et}^{4\text{-}6}$). This distinction reflects the fact that, on average, regenerations take 4 years to complete. Hence, we run the following regression:

$$\mathbf{Y}_{het} = \alpha_{et} + \kappa_{e,r(h,e),g(h)} + \sum_{r \in R} \left(\theta_{0,r}\text{Post}_{et}^{0\text{-}3} + \theta_{1,r}\text{Post}_{et}^{4\text{-}6}\right) \times \mathbb{1}(r(h,e) = r) + \gamma'\mathbf{X_{ht}} + \epsilon_{het} \quad (2)$$

In our main specification, we restrict the sample to regenerations with a permission approved between 2004 and 2012 in order to obtain a balanced sample within 6 years of permission. In the case of rents, we use the period 2007-2012 because rental listings data is only available starting in 2006. Because the sample is unbalanced in relative years -2 and below, we only include rental

---

[28]We include the census tract to account for differences across units around different parts of each ring.

[29]For unit area, we use the average unit area of sales in the postcode in 2008-2019 as reported on Energy Performance Certificates (EPC), a document that details the energy performance of a property that was introduced as mandatory for properties built, sold or let after 2008. When using listings data, we use unit area as reported in that dataset. However, we assign the average unit area of the postcode when this variable is missing. For school market characteristics, we include the number of highly and poorly rated schools within the unit's school catchment area.

[30]To this end, we compute the counts of those variables per block for each calendar year. Then, we assign blocks to a ring for each regenerated estate that falls within 1km of i's population-based centroid. Instead of estate-ring-tract FE ($\kappa_{e,r(h,e),g(h)}$), we use estate-block FE ($\kappa_{e,i}$) –the centroid of a block is always located within a single ring.

listings between event years -3 and 6 when estimating the equations above.

Note that we define the year when the planning permission is approved as the treatment period for two reasons. First, house prices are forward-looking: the path of price effects should start at the moment when information about regeneration first arrives. Second, we expect rents to react to the relocation of displaced households in the nearby area and gradual improvements in local amenities (e.g., reduced crime), both of which increase housing demand before the completion of the project. Thus, using completion as the triggering event likely underestimates the impact.[31] Note that this choice is in contrast to prior research using the completion year as the relevant event to study the rent effects of market-rate construction (Asquith et al., 2021; Pennington, 2021).

Finally, a caveat of our empirical strategy is that it ignores general equilibrium effects: regenerations may have an impact on housing prices throughout the city. Regenerations increase the attractiveness of nearby areas relative to the rest of London, which may decrease relative demand for other neighborhoods in the city. In addition, they also increase housing supply in the city: in our sample, regenerations produce about 29,000 new units (0.9% of the number of households living in London in 2011). We argue that city-wide effects should be small and areas in close distance to regenerations concentrate the largest effects. This argument relates to the no price effects assumption in the outermost ring: if such city-wide exist and are significant, our estimates are downward biased but relative comparisons across rings are unaffected.

4   The Impact of Regenerations on the Local Housing Market

The regeneration of public housing estates into mixed-income housing significantly raises house prices and rents near regenerations, although house prices slightly decrease in the broader area. We also show that the quantity of sales and listings increases very close to regenerations and that rental unit quality goes up. We provide supportive evidence that our price results are likely not driven by changes in the quality of transacted housing stock.

---

[31]In fact, when we define the completion year as the treatment period, we find no effects on rents at any distance from the estate. Appendix Fig. B.3 compares event study results when using both permission and completion years.

4.1 Effects on Prices: House Prices and Rents

Public housing estate regenerations significantly increase house prices in their immediate surroundings but decrease them slightly farther away. Fig. II plots the results for the event study specification using the logarithm of the sale prices and rents as dependent variables. Panel (a) shows that housing units within 200m of the estates experience an increase of about 4% in house prices relative to the omitted group (units in the outermost ring at 800m to 1km), a figure that goes down to a zero effect in the second ring and becomes slightly negative within 400-600m. Although this last effect is not statistically significant in the event study specification, we show below that it becomes significant in the pooled DID regression. Price effects return to zero in the last treated ring (600-800m), which is consistent with effects fading out for sufficiently farther away units.

Rents also significantly increase in nearby areas (panel (b)). In contrast to house prices, the positive effect persists in the broader area. We find that housing units within 400m of an estate experienced rent increases of up to 4% when compared to the most outer ring (panel (c)). Rent effects are statistically undistinguishable from zero beyond that distance.

Fig. III summarizes the results using distance to regenerations as a continuous measure of treatment. The figure estimates Eq. (2): using housing units within 800-1,000m as the comparison group, we pool event years into two "Post" dummies (0-3 and 4-6 years after permission) and interact them with either indicators for 100m rings or a third-order degree polynomial, instead of the 200m ring indicators in the event studies. The reason is that 200m rings do not account for the fact that the number of units within a given ring increases with distance. Hence, housing units closer to the estate within each ring, which are more intensely treated, are underweighted. The main results become starker. Panels (a) and (b) illustrate that, while there is no effect on house prices within 3 years of permission at any distance, house prices rise up to 6% in the long-run only within 100m of the estate. Furthermore, the mild negative effects within 300-600m (2-3%) are statistically significant at the 95% confidence level using both the 100m and polynomial specifications. Rents also go up by about 7% in the long run (bottom panels). In this case, rent increases are still significant up to 400m away from regeneration sites, yet decreasing with distance.

19

The time pattern of price effects in the event study specifications have three main insights. First, house prices do not fully incorporate all information about regenerations at the moment of announcement. Although house prices are forward-looking, i.e., represent the net present value of future rents, house prices do not jump upon permission approval but steadily increase after that. Some potential explanations are that new information may arrive after permission or that there is uncertainty around regeneration plans. However, the effects seem to be fully realized when the projects are completed (on average, event year 4). Second, house prices slightly go down right around permission, which suggests that homeowners place a large value on temporary disruptions arising from demolition and construction. Third, rents go up for units in the second ring right after the permission is approved. Fig. III (c) also shows that rents also go up to 2-3% in the short-run within 300m. This is suggestive evidence that displaced tenants relocating in the surrounding area temporarily increase nearby housing demand and, hence, exert an upward pressure on rents.[32]

Overall, results are consistent with strong demand effects very close to regenerated estates and moderate supply effects that dominate farther away in the sales market. Price increases are considerably high within 100m of the regeneration site, likely because housing units within this distance benefit more from highly localized amenities: a higher-quality building replacing an eyesore, street repavement, new businesses, etc. Strikingly, supply effects dominate demand effects in the sales market in farther away distances but not in the rental market, which still shows positive effects.

There are several potential explanations for the contrasting results in the sales and rental markets in the broader area. First, the two markets are pricing different streams of payments. While house prices refer to the discounted value of all future rents, rents represent the one-year spot market. If households expect rents to go up in the short/medium term and then go down, this could explain the difference.[33] Second, there may be market segmentation. Market-rate units in regenerated estates

---

[32]Temporary relocation is not driving the results in years 4-6 after permission. A concern is that, although regenerations take an average of four years to complete, some regenerations are not completed by that date (sd = 2.5 years). Fig. B.4 shows the result of estimating Eq. (2) adding event years 7-9, when most regenerations are completed. Rent effects for this period are identical to those during event years 4-6.

[33]This would be the case if households expect public housing to generate negative effects in the long-run. For instance, public housing was considered a "reward for good citizenship and focused admission on two-parent households with stable employment" in the United States between the 1930s and the 1950s (Vale and Freemark, 2012). Only after poor maintenance and changes in the sociodemographic composition of its tenants did it fall out of favor.

can be closer substitutes to nearby owner-occupied units than to nearby rental units if, for instance, the latter were generally lower-quality at baseline. We explore this hypothesis using data on Energy Performance Certificates (EPC), a document that details the energy performance of a property by gathering data on several unit characteristics. EPCs were mandatory for buildings constructed, sold, or rented after 2008. Appendix Fig. B.5 regresses a dummy variable indicating whether a property is rented on several unit characteristics for the sample of old owner-occupied and rented units within 800m of a regeneration that were assessed in event years -3 to -1 –regenerations approved before 2009 are not included. The figure provides suggestive evidence that rental units were lower-quality at baseline: they had lower energy ratings, less habitable rooms and lower energy efficiency ratings for some physical elements (e.g., walls). Third, regenerations may push out more the demand for rental units near regenerated areas, e.g., if they attract more renters such as college graduates and young professionals. If the costs of converting owner-occupied housing to rental housing are high, the supply of rental units cannot adjust as much. This issue can be exacerbated by the low share of privately rented units near regenerations (Table I). Finally, an alternative explanation is that landlords upgrade rental units to cater to higher-income households coming to the area after the regeneration –Section 4.3 examines this question in more detail.[34]

Despite the mixed results at different distances, the long-run aggregate effect of estate regenerations on house prices is slightly negative. The number of units exposed to large house price increases within 100m is presumably much lower than that of units experiencing mild decreases within 300-600m. Appendix Table C.1 weights the price effect by the number of private units at each distance.[35] We find that, on aggregate, price decreases in the broader area more than offset nearby price increases: mean prices went down by 0.7 to 1%. Such percentage change is equivalent to a loss of £360-570 millions in 2001 housing stock value –around £1,430-2,250 per unit. An immediate implication is that supply effects in the broader neighborhood compensate regeneration-induced house price increases in the immediate surroundings of the estate.

---

[34]Data on whether sold units correspond to owner-occupied or rental units would be useful to assess this differential impact, yet it is not available.

[35]For this computation, we weight the long-run point estimates of the 100m-ring DID specification ($\theta_{1,r}$ in Eq. (2)) by the number of housing units in each of these rings in 2001.

We also document substantial heterogeneity across estate regenerations. Appendix Fig. B.6 estimates Eq. (2) separately for each regeneration and reports the long-run estimates (4-6 years after permission) for the first three 200m rings. About 25% of regenerations show large increases in house prices and rents in the first ring, while estimates are more evenly distributed and closer to zero in the next two rings. We interpret this as evidence that the trade-off between demand and supply can manifest very differently across regenerations. For instance, demand effects must be very strong for the few regenerations with large housing price increases in the first ring, while the magnitude of supply effects may have lower variance across the estates. Section 6 further explores how results vary by the change in a neighborhood's socioeconomic composition that is induced by regenerations, which can explain an important part of the observed heterogeneity.[36]

Although prior research mainly focuses on housing prices, estate regenerations can also generate endogenous responses in the quantity and quality of transacted housing stock. Examining such responses is important for two reasons. One is that quantity and quality effects also carry information on the effects of regenerations on the surrounding neighborhood. For instance, increases in sales suggest changes in neighborhood composition, while quality changes hint at the characteristics of incoming households. The second reason is that such responses raise the concern that our price estimates are not only capturing the value of living close to a regeneration but also endogenous quality changes. The next two sections further explore these issues.

4.2 Effects on Quantities: Sales, Rental Listings and New Construction

We start by documenting that estate regenerations significantly increased the supply of new homeownership and rental units. To show this, we estimate Eq. (1) using the inverse hyperbolic

---

[36]To show this, Fig. B.7 regresses the estimates in Fig. B.6 on several building and neighborhood characteristics. This exercise reveals two main patterns. First, regenerations in high-income areas led to lower price effects within 200-600m, suggesting that the supply effect is stronger in these areas. Second, house prices and rents are sensitive to changes in socioeconomic composition in the new buildings. An increase in 1pp of market-rate units in the new building relative to all housing units within 800m increase rents by about 3% within 200m, but a decrease in 1pp of public housing units using the same measure increases house prices and rents by about 7-10% within the same distance.

sine of the number of sales and rental listings per block as the outcome variable.[37] Fig. IV shows the results by whether the unit is a new build –Table II also reports the estimates for the pooled DID in Eq. (2). 17% and 10% of housing units within 800m of the estates are categorized as new in the sales and listings samples, respectively. First, we focus on new units in regenerated buildings to examine the magnitude of the shock induced by the regeneration and the time when these units become available (panels (a) and (c)). Unsurprisingly, the number of sales and rental listings within 200m jumps by about 20% and 30%, respectively, from four to six years after the permission is approved, picking up new construction in regenerated buildings. Reassuringly, there is no anticipation and no significant effects in any of the other rings.

Regenerations also significantly increased turnover in the market for old units. Panels (b) and (d) reproduce the analysis above for old housing. Sales of old units increase steadily up to about 20% in the first ring, an effect that persists in the second ring (8%). We interpret this increase as a sign that the area might be becoming more attractive for higher-income households and potentially lead to displacement: sales of (now more expensive) old units suggest a replacement of incumbent households by presumably richer families. In contrast, the number of rental listings of old units in the first ring temporarily decreases in number (5%) around the permission year, which indicates that disruptions caused by construction temporarily affected the rental market. After three years, however, the number of listings only slightly increases.[38] Taken together, these findings suggest that there was not a significant reallocation between the sales and the rental market, i.e., landlords did not put their units up for sale in response to regenerations and vice versa.

Lastly, regenerations temporarily led to more market-rate construction nearby. Table II estimates Eq. (2) for the inverse hyperbolic sine of the number of newly constructed units approved by tenure (public or market-rate). Column 5 shows that regenerations attracted more market-rate units within 200m in the short-run (up to 6%). Such increase supports the idea that regenerations make the area more appealing for high-income households, which are the likely occupants of these units.

---

[37]The inverse hyperbolic sine function (asinh) is defined as $\mathrm{asinh}(a) = \ln(a + \sqrt{1 + a^2})$. This function preserves the interpretation of the logarithm while accounting for the cases in which the value of the variable is zero.

[38]Since we distinguish new and old units in the rental market by whether the listing advertises the unit as new, this is an upper bound –the plot for old units might be including some new units.

4.3 Effects on Quality

The quality of existing housing stock can also change in response to estate regenerations. For instance, landlords may anticipate that regenerated areas will attract high-income households and improve the quality of their units to cater to this group and charge higher rents. We investigate this question in the sample of rental listings, where we can leverage more information on housing quality from listings' descriptions.

We find that nearby landlords are more likely to upgrade rental units and advertise characteristics that appeal to high-income households after regenerations. Fig. V estimates Eq. (2) for dummy variables indicating the presence of several unit and building characteristics in a listing's description. We exclude listings that are advertised as new builds: we focus on changes in advertisement patterns for units already available for rent before regeneration. First, nearby rental units are up to 5 percentage points (about 40% of the baseline) more likely to be refurbished after regeneration –this category includes keywords such as "refurbished", "renovated" or "rehabilitated". These types of investment can improve the quality of the unit in a way that appeals to the high-end of the rental market, luring more high-income individuals into the neighborhood. Interestingly, this effect persists as far as 400m away from regenerated sites, which is consistent with the very significant rent increases in the range between 200 and 400m. It may also explain the differences with the negative price effect in the sales market for this distance range since units up for sale may not be upgraded. Moreover, listings are more likely to advertise several other features. While some results are not statistically significant, they are all suggestive of quality improvements. Within 100m, they are 7.5 p.p. (70% of baseline) more likely to advertise luxury units –although we cannot reject that part of it is capturing units in the new building.[39] More broadly, nearby listings are more likely to mention in-unit washing machines, communal gardens, gyms and concierges.

Reassuringly, the pattern of estimated price effects does not change when we control for these endogenous changes in housing quality. The specification for housing prices in Section 4.1 already

---

[39]The sample in Fig V only includes units that are not explicitly advertised as new builds in the listing's description. Our text analysis method would include new units in regenerated buildings that are not advertised as newly constructed.

controls for a wide range of unit and block characteristics, which can account for changes in the composition of the transacted housing stock. Appendix Fig B.8 reproduces the event study and pooled DID specifications for rents also controlling for the unit and building characteristics in Fig. V. These quality-adjusted estimates yield almost identical findings, suggesting that endogenous responses to housing quality are not likely driving our price estimates.

4.4 Robustness of the Results

The results hold under several robustness checks. First, we obtain similar estimates using an alternative comparison group that leverages plausibly exogenous variation in the timing of regenerations. Second, a specification accounting for the exposure of housing units to multiple regenerations throughout the sample period yields remarkably similar results. Lastly, our findings are robust to only including old units and dropping observations associated to multiple regenerations.

4.4.1 An Alternative Comparison Group: Using Variation in Timing

Following the literature (Aliprantis and Hartley, 2015; Asquith et al., 2021), we develop an alternative difference-in-differences strategy that builds the comparison group using *variation in the timing* of regenerations. This strategy compares the outcomes of housing units near regenerations taking place earlier in the period to those experiencing nearby regenerations later in the future. The idea is that units very close to different public housing estates should be similar. For instance, we can compare the evolution of house prices within 200m of a 2004 regeneration to that of house prices within 200m of a 2018 regeneration between 1998 and 2017.

We view this strategy as complementary to our main specification. The proximity-based method in Section 3.3 assumes that there are no spillovers in the outer ring in order to interpret the gap between the inner and the outer ring as the full treatment effect. A comparison of the estimates of that approach to those of this timing-based method helps us assess the validity of that assumption. However, the timing-based approach may be less well-suited to study effects in areas farther away from regenerated sites. The reason is that, although units immediately surrounding public housing

estates in different areas of the city should be similar, it is less plausible that units farther away from the estates are comparable across regenerated sites.[40]

The identifying assumption is that the timing of estate regenerations is as good as random, e.g., LAs are not targeting estates in the most profitable areas first, which has been argued in the literature (Li, 2019; Mense, 2020; Pennington, 2021). The plausibility of this assumption depends on a number of factors, some of which are observable (e.g., building and neighborhood characteristics) and some that we cannot observe, such as differential availability of funds over time, negotiations with developers, consultation with tenants, etc. Consistent with the assumption, regeneration seems un-correlated with several characteristics. Appendix Fig. B.9 regresses the permission year on building and neighborhoood characteristics; none of them is statistically significant.

To implement this strategy, we run a stacked event study design (Cengiz, Dube, Lindner and Zipperer, 2019; Deshpande and Li, 2019; Fadlon and Nielsen, 2019) for each of the four treated rings in the main specification (0-200, 200-400, 400-600, 600-800m).[41] We construct the sample as follows. First, we keep observations in the relevant ring to any regenerated estate e. For each estate, we create a separate dataset d. In each dataset d, estates that experience the current regeneration have $\text{Treated}_{ed} = 1$, and estates that are regenerated more than two years later serve as the comparison group, which we further restrict in two ways. First, since regeneration decisions take place at the LA level, we exclude to-be regenerated estates in the same LA as the treated estate to rule out anticipation effects.[42] Second, we only include to-be regenerated estates in the same broad London area, defined as being either in Inner or Outer London.[43] Then, we create an event year τ variable with respect to the permission year of the treated estate in dataset d. Finally, we append all datasets and keep sales/listings within 6 years of permission.

---

[40]For instance, the timing-based method probably performs well comparing units within 200m of the estates but poorly when studying units within 600-800m. In this last case, the proximity-based method is likely to perform better since it compares units that are only slightly farther away from each other that belong to the same neighborhood –e.g., compare units within 600-800m to those within 800-1,000m of the same estate.

[41]The stacked methodology is robust to heterogeneous treatment effects, under which traditional event studies perform poorly (Callaway and Sant'Anna, 2020; Sun and Abraham, 2020; **?**; Borusyak, Jaravel and Spiess, 2021).

[42]E.g., regenerating an estate can be a signal of how likely other estates in that LA are to be regenerated in the future.

[43]This restriction partially addresses the concern that this specification cannot control for neighborhood time patterns by accounting for different time patterns in the center and the outskirts of the city.

We estimate the following equation separately for each ring:

$$\mathbf{Y}_{hetd} = \omega_{td} + \phi_{e,g(h),d} + \sum_{\tau=-6}^{6} \beta_\tau \, \mathbb{1}(t - E_d = \tau) \times \text{Treated}_{ed} + \gamma' \mathbf{X}_{\mathbf{ht}} + \epsilon_{hetd} \qquad (3)$$

where β_τ is the effect of interest, i.e., evolution of the outcomes for units near a current regeneration compared to those that experience a regeneration in the future. We include calendar year-dataset FE (ω_{td}) and estate-census tract-dataset FE ($\phi_{e,g(h),d}$) to control for time patterns and baseline characteristics, as well as the same controls $\mathbf{X}_{\mathbf{ht}}$ as in Eq. (1). To be consistent with the proximity-based specification, we weight each dataset-year-treated estate equally and, within it, we also weight each estate-block equally. Standard errors are clustered at the dataset level to account for the fact that estates appear in the comparison group for multiple datasets.

The timing-based method yields very similar results to our main specification (Appendix Fig. B.10). We find that house prices go up to 5% within 200m and decrease by 3% within 400-600m –there is also a temporary decrease of house prices within 200m around permission consistent with Fig. II. Note that this strategy, however, perfoorms poorly for rings farther away from the estate: the 600-800m ring shows a pre-trend of decreasing house prices before regeneration. This fact warns against comparing units in far away rings (>600m) across estates, likely because neighborhoods around regenerated buildings are no longer similar at those distances. Regarding rents, they also increase by 5% within 200-400m, although the results do not hold for units within 200m, which show an unstable pre-trend under this method. Estimated effects on the number of sales and listings, as well as changes in housing quality, are also very close to our main specification (Appendix Figs. B.11 and B.12). Overall, the similarity of timing-based estimates supports the assumption of no spillover effects to the outermost ring in the proximity-based method.

4.4.2 Robustness to Treatment Intensity

A concern with our main DID specification is that it does not account for the fact that some units appear in different rings for different estate regenerations and, thus, are contaminated by another

treatment –i.e., it treats each regeneration as a separate event. To address this issue, we lay out an empirical specification that estimates the effect of an additional regeneration at a given distance of a census block conditional on other regenerations taking place in that block's neighborhood.

We regress the long-run change in a block's house price level on the number of regenerations taking place in all 100m rings around that block up to 1.2km. To do this, we follow Baum-Snow and Han (2020) and Blanco (2021) and create a quality-adjusted house price index ρ_{it} for each block i and period t, where $t = \{1998\text{-}2002, 2015\text{-}2019\}$.[44] Note that the first period ends before the first regeneration is approved and the second period starts three years after the last regeneration in our balanced sample is approved. Next, we compute the number of estate regeneratons in 2004-2012 within each 100m ring of every block in London and run the following regression:

$$\Delta\rho_i = \alpha_{l(i)} + \sum_{r(i) \in R} \beta_r \text{Regenerated estates}_{r(i)} + \rho_i^{98-02} + \omega X_i + \varepsilon_i \qquad (4)$$

where $\Delta\rho_i = \rho_i^{15-19} - \rho_i^{98-02}$. $r(i)$ denotes 100m rings up to 1.2 km of block i and $\alpha_{l(i)}$ are local authority FE. As control variables X_i, we include baseline census block density, number of households, share of public housing units, share of owners and the baseline house price index.[45]

Accounting for the intensity of treatment yields remarkably similar results to the DID strategy –results do not seem to be driven by overlapping rings. Panel (a) of Appendix Fig. B.13 shows the results for Eq. (4). Blocks experiencing one regeneration within 100m experience house appreciations of up to 10%, 4 percentage points higher than in our difference-in-differences estimates. Likewise, we observe negative price effects of up to 2% slightly farther away (around 500m away from the estate) and effects go back to zero beyond 600m. Note that the interpretation of β_r is slightly different in this case: it measures the effect of being exposed to an additional regeneration

---

[44]This house price index is the result of running a regression of log house prices on unit characteristics in the sample that includes the years in each of the two periods:

$$\ln(P_{ht}) = \alpha + \tilde{\rho}_{i(h)t} + \gamma X_{ht} + u_{ht}$$

where X_{ht} includes all of the control variables we used in the analysis above, except for block characteristics. $\tilde{\rho}_{i(h)t}$ are block-by-period FE. Then, we generate the house price index as $\rho_{it} = \alpha + \tilde{\rho}_{i(h)t}$.

[45]We adjust standard errors for spatial autocorrelation following Conley (1999).

at a given ring. As a robustness check for this specification, panel (b) runs a placebo test using the change in the house price index between 1998-2000 and 2001-2003, both in the pre-period: all coefficients go to zero and become statistically insignificant. We do not replicate this result for rents because data is only available starting in 2006: the pre-treatment period is very short for some regenerations, which may not have enough listings and generate a noisy index.

Moreover, dropping sales and listings that show up for multiple regenerations in our main DID specification does not affect the results. Fig. B.14 estimates Eq. (2) with 200m rings for house prices and rents using three different samples: including only the house sale occurring closest to the regenerated building, i.e., most intensely treated; only the earliest house sale; or dropping all duplicated observations. Coefficients are remarkably similar to our main results for all samples.

4.4.3 Robustness to Sample Selection and Others

The estimated price effects also hold under additional robustness checks. First, our findings are not sensitive to the set of permission years included in the sample. Appendix Fig. B.15 shows that the estimates for house prices hold when using the same sample than for rents (permissions approved in 2007-2012). Fig. B.16 reveals that rent effects also hold for a panel of regenerations balanced between event years -3 and 6, i.e., with permission years in 2009-2012.

Second, we run the main regressions only using the sample of old units. Since new builds can substantially change the housing stock quality, old units are better suited to estimate the price effects that are mainly due to neighborhood changes. Figs. B.17 and B.18 show that the results hold almost equally for the two main event study designs and the pooled DID specification, respectively.

Lastly, the analysis is robust to using different control variables. Fig. B.19 runs the pooled DID in Eq. (2) for house prices and rents using 200m rings with different subsets of control variables. Only the house price effect for house sales within 200m of an estate regeneration is slightly affected when the average square footage of units in the postcode is included: it goes from 2% to 4%. The reason is that units sold in the immediately surrounding area are smaller after the regeneration, which can be partly driven by the new market-rate construction induced by it (Fig. B.20).

29

5 Mechanisms: The Role of Demand Effects

The spatial pattern of price effects suggests that demand effects are concentrated very close to regenerated sites. We present supportive evidence for this hypothesis: we show that regenerations led to an inflow of high-income households, an increase in positive local amenities (e.g., cafés, restaurants) and a reduction in negative local amenities (e.g., crime).

5.1 Effects on the Neighborhood's Socioeconomic Composition

Estate regenerations substantially change the neighborhood composition by bringing in higher-income households. To show this, we estimate a version of Eq. (1) at the block group level using the number of (primary school-age) children per block group that are eligible/not eligible for school subsidized lunches as an outcome.[46] Panel (a) of Fig. VI shows that there is no long-run change in the number of children with subsidized lunch, which is consistent with the fact that public housing units were preserved on average. Instead, panel (b) shows that, six years after the regeneration's announcement, the number of children without subsidized lunch living near regenerated sites increases by up to 10 children (about 12.5% of the baseline average of 80 unsubsidized children). These results likely underestimate the compositional change because we cannot measure differences in socioeconomic status for residents without school children or at different points in the distribution than the school lunch cutoff.[47]

The growing number of richer households likely puts further upward pressure on prices, given that prior literature indicates that households are willing to pay to live near higher-income and more educated neighbors (Bayer et al., 2007; Guerrieri et al., 2013; Diamond, 2016). In our context, households also seem to place a significant discount on units near public housing. We find that

---

[46]The sample is constructed analogously as in Section 4, i.e., we link each block group to all regenerations within 1km based on its population centroid. Although the sample of regenerations is the same as in that section (regenerations with permissions in 2004-2012), the sample is unbalanced because data on children are available only for 2002-2016.

[47]Using subsidized lunch eligibility of children as a proxy for socioeconomic status of the block group assumes that incoming households after the regeneration have the same number of primary school-age children on average than previous residents. However, as discussed in Section 4.4, new units are usually smaller in the sales market, suggesting smaller household sizes of new neighbors. In line with this, revitalization might also attract more young professionals to the area, who tend to have less children than households living in the old public housing estates.

a 1 p.p. increase in the public housing share in a newly regenerated estate is associated with a 0.58% price reduction for new market-rate sales in the same block –although there is no significant effect for rents (Appendix Fig. B.21). In addition, high-income households relocating to the new buildings will demand better schools (Hastings, Kane and Staiger, 2010). In fact, Neri (2020) shows that student performance increases in primary schools near regenerations after completion. In contexts where school admission runs by distance such as England, housing units near good schools benefit from a substantial price premium (Black, 1999; Fack and Grenet, 2010; Gibbons, Machin and Silva, 2013; Battistin and Neri, 2017).

5.2   Effects on Neighborhood Amenities

We find that rental listings within 100m are more likely to advertise their units as being close to local amenities, cafés, restaurants and parks. The first row of Fig. V estimates Eq. (2) for dummies indicating the presence of these amenities in a listing's description. In the case of cafés, restaurants and parks, these effects are also sizeable slightly farther away from regenerated sites. Note that we exclude listings that are advertised as new builds: we focus on changes in advertisement patterns for units already available for rent before regeneration.

Listings are more likely to include these words right after the announcement of a regeneration, which is consistent with two alternative explanations. On the one hand, businesses might anticipate the revitalization of these neighborhoods and open an establishment before regenerations are completed. This explanation implies that regenerations actually attract new businesses that potentially cater high-income households such as cafés.[48] On the other hand, landlords may anticipate that the regeneration process will bring high-income households that otherwise would have not rented in the area. Thus, landlords may decide to tailor the listings' description to these newcomers by reporting these amenities more frequently. This last explanation does not necessarily mean that new businesses and green spaces actually open as a result of regenerations.[49]

---

[48]Previous literature uses cafés and restaurants as proxies for neighborhood change (Couture and Handbury, 2017; Glaeser, Kim and Luca, 2018; Li, 2019; Singh, 2020). In particular, cafés and restaurants increase the attractiveness of a neighborhood to young professionals and college graduates, and drive up house prices and rents.

[49]In the future, we plan to test this last hypothesis by contrasting these results with the effects of regenerations on

5.3 Effects on Crime

Estate regenerations also significantly decrease the number of crimes in the immediate surroundings. Again, we run the proximity specification on the inverse hyperbolic sine of the total number of crimes in a block group.[50] Note that, in this case, the sample of regenerations does not coincide with that section, since data is only available for the period 2008-2018. Fig. VII shows the results for the full sample of regenerations being approved in that period and for the subset of estates with a size of the existing building that is above the median. Regenerations decreased crime by around 5% within 200m, 12% for large regenerations. These numbers are close to crime decreases after public housing demolitions in the US –8.8% decrease within 400m (Aliprantis and Hartley, 2015; Sandler, 2016).

Using estimates from the literature that relate crime to house price changes, we estimate that only one-third of the house price increases within 200m of a regeneration can be explained by observed crime reductions. Our back-of-the-envelope calculation is based on Gibbons (2004), that estimates that a 10% increase (at the sample mean) of criminal damage crimes per km^2 pushes down property prices in Inner London by 1.5%. This estimate is especially convenient because Gibbons (2004) considers the number of crimes within 250m of a property as their independent variable - whereas we use 200m bins in our main specification. Appendix Table C.2 reports the effects on both total crime and criminal damage using Gibbons' methodology.[51] The estimated 8.84% decrease at the sample mean in criminal damage crimes implies a 1.33% increase in house prices (the sample

---

the issue of actual business licenses. We are in the process of applying for these data.

[50]The sample is constructed analogously as in Section 4, i.e., we link each block groups to all regenerations within 1km based on its population centroid.

[51]Since Gibbons (2004) measures crime as deviations from a locally weighted average of crimes, we follow that paper and redefine our variable as the difference between the number of crimes in a block group (in 100s per km^2) and a locally weighted average of the number of crimes in all other block groups within 2km. Our locally weighted average of variable x_i in block group i, $\hat{m}(x_i | d_{i,-j})$ is constructed as follows:

$$\hat{m}(x_i | d_{i,-j}) = \left\{ \sum_{j \neq i} x_j \phi(d_{ij} h_i^{-1}) \right\} \left\{ \sum_{j \neq i} \phi(d_{ij} h_i^{-1}) \right\}^{-1}$$

where d_{ij} is the distance between block group i and j, h_i is the standard deviation of d_{ij} for block group i. We compute this variable for every block group i-year combination.

mean is 1.21 per km^2 –in 100s– and criminal damages decreased by 0.107 –column 7), a number that goes up to 1.71% when considering the largest estates.

6 Heterogeneity: Regenerations as a Shock to Neighborhood Socioeconomic Composition

Urban renewal programs such as public housing regenerations usually raise concerns about increased housing unaffordability for nearby low-income households. In our context, new market-rate units can be a shock to the neighborhood socioeconomic composition by bringing in relatively higher-income households. Given that prior research indicates that households are willing to pay to live near higher-income neighbors,[52] such shock may trigger (or intensify) an upward trend on housing prices near regenerated sites. We provide suggestive evidence for this hypothesis by studying heterogeneity in price effects along two dimensions: baseline neighborhood socioeconomic composition and the magnitude of market-rate construction.

6.1 Heterogeneity by Baseline Socioeconomic Composition

Low-income neighborhoods are especially affected by regeneration-induced housing price increases. These neighborhoods have the highest potential for composition changes: holding market-rate construction (i.e., incoming higher-income households) constant, low-income neighborhoods experience a larger shock to socioeconomic composition than high-income neighborhoods.

To explore this idea, we study heterogeneity by two neighborhood characteristics: mean household income and house price levels in 2001. For each regeneration, we compute the mean of these two variables among all census block groups within 800m of the estate, which includes all treated rings in our main specification.[53] Next, we estimate a version of Eq. (2) that interacts relative time and 100m-ring indicators with a dummy variable indicating whether the value of the heterogeneity

---

[52]E.g., Bayer et al. (2007); Guerrieri et al. (2013); Diamond (2016)

[53]We construct house price levels for each block group as in Section 4.4.2 –the same regression is run for year 2001.

variable is above or below the median in the regenerations sample (Z_e):

$$\mathbf{Y}_{het} = \quad \alpha_{et} + \kappa_{e,r(h,e),g(h)} + \gamma' \mathbf{X_{ht}}$$
$$+ \sum_{z \in \{0,1\}} \sum_{r \in R} (\theta_{0,r}^z \text{Post}_{et}^{0\text{-}3} + \theta_{1,r}^z \text{Post}_{et}^{4\text{-}6}) \times \mathbb{1}(r(h,e) = r, Z_e = z) + \epsilon_{het} \qquad (5)$$

We find that rent increases are especially concentrated in low-income areas. Fig. VIII illustrates the results for the two variables, plotting the price effects by distance for two subsamples: regenerations that are above vs below the median. While regenerations in higher-income neighborhoods and areas with higher baseline house prices experience larger rent increases within 100m of regenerated sites, the opposite is true for units within 100 and 600m: poorer areas bear most of the rent increases. These findings suggest that richer neighbors value more changes in amenities, which are plausibly very concentrated near the new buildings, but such improvements in amenities make housing less affordable in the broader area for low-income households in poorer neighborhoods. In the case of house prices, no clear pattern arises.

The results are consistent with the supply effect being stronger for high-end units. The reason is that new market-rate units in regenerated estates are a closer substitute to the high-end of the rental market than to low-end units. Since household income and baseline house prices are proxies for housing quality, our results support this vision. The findings contrast with Asquith et al. (2021), who estimate that new market-rate buildings reduce nearby rents in low-income areas. A potential reason is that Asquith et al. (2021) use Zillow data, which overrepresent high-end units. In contrast, Rightmove seems more representative of London's rental market (Appendix A.1). Our results support the findings in Damiano and Frenier (2020), who find that new-market rate housing decreases nearby rents for high-end units but increases them for low-end units.[54]

Finally, we find suggestive evidence that nearby landlords respond to regenerations by increasing the quality of rental units only in low-income areas. Appendix Fig. B.22 shows that the significant

---

[54]We cannot reproduce the analysis in Damiano and Frenier (2020), which divides the sample in low, middle and high-end units –referred to as "housing submarkets". That paper leverages a panel of rental apartment buildings, which they can divide into housing submarkets using baseline rent levels within a zipcode. In contrast, Rightmove data does not perform well tracking listings belonging to the same unit over time.

effect on refurbishments in Section 4.3 exclusively takes place in low-income areas. As discussed in that section, landlords cater more to high-income households by upgrading. Quality upgrades are most profitable in low-income areas, since potential gains from rent increases are higher.

6.2 Heterogeneity by the Magnitude of Market-Rate Construction

Market-rate construction is an alternative proxy for changes in neighborhood socioeconomic composition. Given two regenerations in identical neighborhoods, the regeneration building relatively more market-rate units should increase the neighborhood's socioeconomic status by more.

However, the effect on prices of building more market-rate housing is ambiguous. On the one hand, more incoming high-income households alter the income mix of a neighborhood and may in turn bring more amenities (Diamond, 2016). Because the neighborhood is more attractive, housing demand shifts outwards, putting an upward pressure on prices. On the other hand, a large expansion of market-rate supply puts more downward pressure on prices: keeping demand constant, the willingness to pay of the marginal incoming household is (weakly) smaller. Whether net prices go up or down with more extreme levels of market-rate construction gives us a sense of how much socioeconomic composition matters –if prices increase by more, the second mechanism is crucial to explain the results.

To study this, we define the variable "market shock" as the change in market-rate units in the regenerated estate over the total number of housing units within 800m, our last treated ring:

$$\text{Market shock}_e = \frac{\Delta \text{Market units}_e}{(\text{Housing units} \leq 800\text{m})_e}$$

We analogously define "public shock" and "total shock" as the change in public housing and total units, respectively. Then, we estimate Eq. (5) for each of the three "shocks" separately, where Z_e is a dummy variable that splits the sample of regenerations in two based on whether they are above or below the median value of the shocks.

Regenerations with more market-rate construction consistently show larger house price and rent

increases (Fig. IX). In the case of house prices, regenerated areas below the median of the market shock experience price decreases within 200-500m of an estate. In a similar fashion, rent increases within that range are exclusively concentrated in areas with market-rate construction above the median –areas below it do not experience significant changes in rents. In the case of rents, we find suggestive evidence that the result is not driven by developers building higher-quality units in regenerations with larger market shocks. Appendix Table C.3 regresses some unit characteristics on the market shock variable and none of them are statistically significant at the 5% level. Meanwhile, no clear pattern arises when examining price effects by the size of the public or total housing shocks.

These findings suggest that the mixed-income component of housing is key to explain observed effects on local housing prices. For moderate rates of market-rate construction, nearby house prices can decrease and rent levels can be maintained –supply effects weakly dominate demand effects in the broader area. However, large market-rate shocks are more likely to significantly change the neighborhood socioeconomic composition and potentially gentrify it. Such idea is consistent with the hypothesis that enough high-income households arriving to a low-income area are needed in order to change the trajectory of a neighborhood. Note that demand effects always dominate supply effects within 100m in our context. A likely explanation is that the new buildings are usually replacing distressed public housing estates and, thus, benefits from building improvements are exceptionally large for immediately surrounding housing units.

Lastly, a concern for the results above is that we observe positive price effects associated to larger market shocks because developers decide to partner up with LAs to supply more market-rate units in more profitable areas. To explore this, Fig. B.23 shows the coefficients of a multivariate regression of the market shock on building and neighborhood characteristics. Larger market shocks are not predicted by any neighborhood characteristics. Usually, the market-shock is bigger in larger existing estates and tracks the total shock in the nearby area. These results alleviate the concern that regenerations with high market shocks are in selected neighborhoods.

7 Cost Effectiveness of Public Housing Regenerations

The results indicate that mixed-income regenerations revitalize affected neighborhoods by improving local amenities and increasing income diversity, even after preserving the amount of public housing. However, regenerations are a costly investment. In this section, we compare the appreciation in nearby housing values due to an additional regenerated public housing unit to the associated costs for the public sector –Appendix A.3 provides the details. We focus on the "place-based" aspect of the policy: we exclude the benefits and costs for households in regenerated buildings.

The cost effectiveness analysis is especially challenging in our context. Regarding benefits, an ideal estimate of society's willingness to pay for the policy would be captured by the shift in housing demand after regenerations. However, our estimated price effects do not have a direct welfare interpretation because they conflate demand and supply responses.[55] Hence, we take increases in nearby housing prices as a lower bound for benefits. Regarding costs, we would ideally gather data on the costs of each redevelopment project that are borne by the public sector, but such data is not available. Furthermore, the cost for the public sector may widely vary from estate to estate, since they are the result of a negotiation process between LAs/HAs and developers.[56] More generally, the planning system in London –and the UK– is not based on zoning, i.e. there is no automatic right to build according to some local zoning rules. All planning decisions are discretionary and taken on a case-by-case basis by LAs. In the case of regenerations, this system may be used to relax the budget constraint of LAs, e.g., by allowing developers to build more market-rate housing if they bear a higher share of the cost of new public housing units. In the extreme case, regenerations can come at a zero cost for LAs –and, hence, always pay off. Below, we focus on the case in which the public sector pays a positive amount of the cost.

For the benefits of regeneration, we compute a range of quantities that are likely an underestimate of WTP. First, we estimate that each regenerated unit leads to an increase in the aggregate

---

[55]For this reason, we cannot use the marginal value of public funds to measure the cost effectiveness of public housing regenerations (Hendren and Sprung-Keyser, 2020; Finkelstein and Hendren, 2020).

[56]Housing Committee Members, *"Knock it Down or Do it Up? The Challenge of Estate Regeneration"*, Greater London Authority, February 2015.

value of house prices within 100m of £3,650. Second, we estimate that this number adds up to £39,650 when considering rental price increases within 400m. Lastly, we also compute the net present discounted value (NDVP) of changes in long-run earnings of children exposed to regenerations. This concept is just one of many factors that cause the outward shift in the demand curve –but that we can approximate. We translate increases in test scores of incumbent children induced by regenerations as estimated in Neri (2020) to increases in future earnings: each regenerated unit leads to an associated benefit of £21,730 for this concept.[57]

To put these numbers in context, we compute the NPDV of the net costs of regeneration, which include the mechanical costs of the demolition, reconstruction and relocation of households while the development is under construction, minus any fiscal revenues accruing to the government's budget. We approximate the first two types of costs using estimates from research reports. Since the financing of regeneration programs varies from site to site, we consider two scenarios for reconstruction costs: either LAs pay a flat subsidy for each regenerated public housing unit or they pay their full cost. For the latter, we consider a lower and an upper bound given by alternative costs estimates. For relocation, we consider the mean rental price of relocating a household within 800m of an estate in the four years leading to the completion of the project. Regarding fiscal revenues, we subtract tax savings from the council tax (analogous to a property tax) and the stamp duty land tax (a sales tax on house sales) of new market-rate units. In total, we estimate that the regeneration of an additional public housing unit ranges from £147,525 to £430,765.

Thus, estimated housing value appreciations are very low relative to regeneration costs (see Table C.4). While house price increases within 100m account for at most 2.5% of regeneration costs, rent increases within 400m represent between 9 and 27% of regeneration costs. Finally, increases in children's future earnings can account for 5 to 15% of the costs.

---

[57]Neri (2020) estimates that regenerations increased test scores by 0.091 standard deviations for incumbent children living within approximately 1km of regenerated sites. We closely follow the computation in Hendren and Sprung-Keyser (2020), and convert them into future earnings using the estimate in Kline and Walters (2016).

8 Conclusion

This paper estimates the impact of regenerating old public housing developments into mixed-income communities. Over a six-year period, we estimate that regenerations raised house prices and rents in the vicinity of the new building, and decreased house prices slightly farther away. This spatial pattern of net price effects is consistent with strong demand effects very close to the new development and supply effects that domine farther away in the sales market.

Our findings highlight that mixed-income developments have the potential of preventing the negative effects of public housing even when preserving the amount of existing public housing. Our results provide guidance for future place-based policies that aim to revitalize deprived neighborhoods, which can be particularly relevant in contexts characterized by the lack of mobility of low-income households (Bergman, Chetty, DeLuca, Hendren, Katz and Palmer, 2019).

However, the improvement in local amenities and new-market rate construction can have unintended consequences. When we explore heterogeneity, we find suggestive evidence that low-income households are most affected by increased unaffordability. First, rent increases are concentrated in low-income and lower-priced areas at baseline. Second, large rates of new market-rate housing in the new building are associated with larger price increases: more incoming high-income households have the potential to change the trajectory of the neighborhood and gentrify it. Future research should study how low-income households can reap the benefits of urban renewal while not suffering the negative consequences from rising housing prices, e.g. displacement and financial stress. A potential solution proposed by Diamond, McQuade and Qian (2019) is for the government to provide insurance against rent increases.

Finally, this paper argues that policymakers need to consider the differential impacts of placed-based policies on sales and rental markets. Using unique micro-data on both sale and rental prices, we show that regenerations have contrasting price effects in the broader area: house prices go down while rents go up. While we provide some potential reasons for these differences, future research should further investigate the mechanisms behind this result.

References

Aliprantis, Dionissi and Daniel Hartley, "Blowing it up and knocking it down: The local and city-wide effects of demolishing high concentration public housing on crime," *Journal of Urban Economics*, 2015, *88*, 67 – 81.

Asquith, Brian J., Evan Mast, and Davin Reed, "Local Effects of Large New Apartment Buildings in Low-Income Areas," *The Review of Economics and Statistics*, 05 2021, pp. 1–46.

Battistin, E. and L. Neri, "School Performance, Score Inflation and Economic Geography," *IZA Discussion Paper No. 11161*, 2017.

Baum-Snow, Nathaniel and Lu Han, "The Microgeography of Housing Supply," *Working Paper*, July 2020.

Bayer, Patrick, Fernando Ferreira, and Robert McMillan, "A Unified Framework for Measuring Preferences for Schools and Neighborhoods," *Journal of Political Economy*, 2007, *115* (4), 588–638.

Bergman, P., R. Chetty, S. DeLuca, N. Hendren, L. F. Katz, and C. Palmer, "Creating Moves to Opportunity: Experimental Evidence on Barriers to Neighborhood Choice," *NBER Working Paper No. 26164*, 2019.

Black, S. E., "Do Better Schools Matter? Parental Valuation of Elementary Education," *The Quarterly Journal of Economics*, 1999, *114* (2), 577–599.

Blanco, Hector, "Pecuniary Effects of Public Housing Demolitions: Evidence from Chicago," *Working Paper*, 2021.

Borusyak, Kirill, Xavier Jaravel, and Jann Spiess, "Revisiting Event Study Designs: Robust and Efficient Estimation," *Working Paper*, 2021.

Brown, LaTanya N., "HOPE VI: An Analysis to Determine the HOPE VI Program's Influence on Home Sales," *Community Development*, 2009, *40* (1), 54–63.

Callaway, Brantly and Pedro H.C. Sant'Anna, "Difference-in-Differences with multiple time periods," *Journal of Econometrics*, 2020.

Cengiz, Doruk, Arindrajit Dube, Attila Lindner, and Ben Zipperer, "The Effect of Minimum Wages on Low-Wage Jobs*," *The Quarterly Journal of Economics*, 05 2019, *134* (3), 1405–1454.

Chyn, Eric, "Moved to Opportunity: The Long-Run Effects of Public Housing Demolition on Children," *American Economic Review*, October 2018, *108* (10), 3028–56.

Coate, Stephen, Stephen Johnson, and Richard Zeckhauser, "Pecuniary redistribution through in-kind programs," *Journal of Public Economics*, 1994, *55* (1), 19 – 40.

Conley, Timothy, "GMM estimation with cross sectional dependence," *Journal of Econometrics*, 1999, *92* (1), 1–45.

Couture, Victor and Jessie Handbury, "Urban Revival in America, 2000 to 2010," Working Paper 24084, National Bureau of Economic Research November 2017.

Damiano, Anthony and Chris Frenier, "Build Baby Build?: Housing Submarkets and the Effects of New Construction on Existing Rents," *Center for Urban and Regional Affairs Working Paper, University of Minnesota*, 2020.

Deshpande, Manasi and Yue Li, "Who Is Screened Out? Application Costs and the Targeting of Disability Programs," *American Economic Journal: Economic Policy*, November 2019, *11* (4), 213–48.

Diamond, Rebecca, "The Determinants and Welfare Implications of US Workers' Diverging Location Choices by Skill: 1980-2000," *American Economic Review*, March 2016, *106* (3), 479–524.

_ **and Tim McQuade**, "Who Wants Affordable Housing in Their Backyard? An Equilibrium Analysis of Low-Income Property Development," *Journal of Political Economy*, 2019, *127* (3), 1063–1117.

_ , _ , **and Franklin Qian**, "The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco," *American Economic Review*, September 2019, *109* (9), 3365–94.

Eriksen, Michael D. and Stuart S. Rosenthal, "Crowd out effects of place-based subsidized rental housing: New evidence from the LIHTC program," *Journal of Public Economics*, 2010, *94* (11), 953 – 966.

Fack, G. and J. Grenet, "When Do Better Schools Raise Housing Prices? Evidence from Paris Public and Private Schools," *Journal of Public Economics*, 2010, *94*, 59–77.

Fadlon, Itzik and Torben Heien Nielsen, "Family Health Behaviors," *American Economic Review*, September 2019, *109* (9), 3162–91.

Finkelstein, Amy and Nathaniel Hendren, "Welfare Analysis Meets Causal Inference," *Journal of Economic Perspectives*, November 2020, *34* (4), 146–67.

Fraser, James C., Deirdre Oakley, and Diane K. Levy, "Guest Editors' Introduction: Policy Assumptions and Lived Realities of Mixed-Income Housing on Both Sides of the Atlantic," *Cityscape*, 2013, *15* (2), 1–14.

Gibbons, S., S. Machin, and O. Silva, "Valuing school quality using boundary discontinuities," *Journal of Urban Economics*, 2013, *75.*

Gibbons, Steve, "The Costs of Urban Property Crime*," *The Economic Journal*, 2004, *114* (499), F441–F463.

Glaeser, Edward L., Hyunjin Kim, and Michael Luca, "Nowcasting Gentrification: Using Yelp Data to Quantify Neighborhood Change," *AEA Papers and Proceedings*, May 2018, *108*, 77–82.

Goetz, Edward G., "The Transformation of Public Housing Policy, 1985–2011," *Journal of the American Planning Association*, 2012, *78* (4), 452–463.

Guerrieri, Veronica, Daniel Hartley, and Erik Hurst, "Endogenous gentrification and housing price dynamics," *Journal of Public Economics*, 2013, *100*, 45–60.

Haltiwanger, John C, Mark J Kutzbach, Giordano E Palloni, Henry Pollakowski, Matthew Staiger, and Daniel Weinberg, "The Children of HOPE VI Demolitions: National Evidence on Labor Market Outcomes," Working Paper 28157, National Bureau of Economic Research November 2020.

Hastings, J. S., T. J. Kane, and D. O. Staiger, "Heterogeneous Preferences and the Efficacy of Public School Choice," *Working Paper*, 2010.

Hendren, Nathaniel and Ben Sprung-Keyser, "A Unified Welfare Analysis of Government Policies*," *The Quarterly Journal of Economics*, 03 2020, *135* (3), 1209–1318.

Jacob, Brian A., "Public Housing, Housing Vouchers, and Student Achievement: Evidence from Public Housing Demolitions in Chicago," *American Economic Review*, March 2004, *94* (1), 233–258.

Kline, Patrick and Christopher R. Walters, "Evaluating Public Programs with Close Substitutes: The Case of Head Start*," *The Quarterly Journal of Economics*, 07 2016, *131* (4), 1795–1848.

Koster, Hans R. A. and Jos van Ommeren, "Place-Based Policies and the Housing Market," *The Review of Economics and Statistics*, 2019, *101* (3), 400–414.

Lees, Loretta and Hannah White, "The social cleansing of London council estates: everyday experiences of 'accumulative dispossession'," *Housing Studies*, 2020, *35* (10), 1701–1722.

Li, Xiaodi, "Do New Housing Units in Your Backyard Raise Your Rents?," *Working Paper*, 2019.

Mense, Andreas, "The Impact of New Housing Supply on the Distribution of Rents," *ZBW - Leibniz Information Centre for Economics*, 2020.

Neri, Lorenzo, "Moving Opportunities: The Impact of Public Housing Re-generations on Student Achievement," Working Papers 907, Queen Mary University of London, School of Economics and Finance June 2020.

Pennington, Kate, "Does Building New Housing Cause Displacement?: The Supply and Demand Effects of Construction in San Francisco," *Working Paper*, 2021.

Power, Anne, "Does demolition or refurbishment of old and inefficient homes help to increase our environmental, social and economic viability?," *Energy Policy*, 2008, *36* (12), 4487–4501.

Sandler, Danielle, "Externalities of Public Housing: The Effect of Public Housing Demolitions on Local Crime," *Regional Science and Urban Economics*, 11 2016, *62*.

Sinai, Todd and Joel Waldfogel, "Do low-income housing subsidies increase the occupied housing stock?," *Journal of Public Economics*, 2005, *89* (11), 2137 – 2164.

Singh, Divya, "Do Property Tax Incentives for New Construction Spur Gentrification? Evidence from New York City," *Working paper*, 2020.

Slater, Tom, "The invention of the 'sink estate': Consequential categorisation and the UK housing crisis," *The Sociological Review*, 2018, *66* (4), 877–897.

Sun, Liyang and Sarah Abraham, "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects," *Journal of Econometrics*, 2020.

Tach, Laura and Allison Dwyer Emory, "Public Housing Redevelopment, Neighborhood Change, and the Restructuring of Urban Inequality," *American Journal of Sociology*, 2017, *123* (3), 686–739.

Vale, Lawrence J. and Yonah Freemark, "From Public Housing to Public-Private Housing," *Journal of the American Planning Association*, 2012, *78* (4), 379–402.
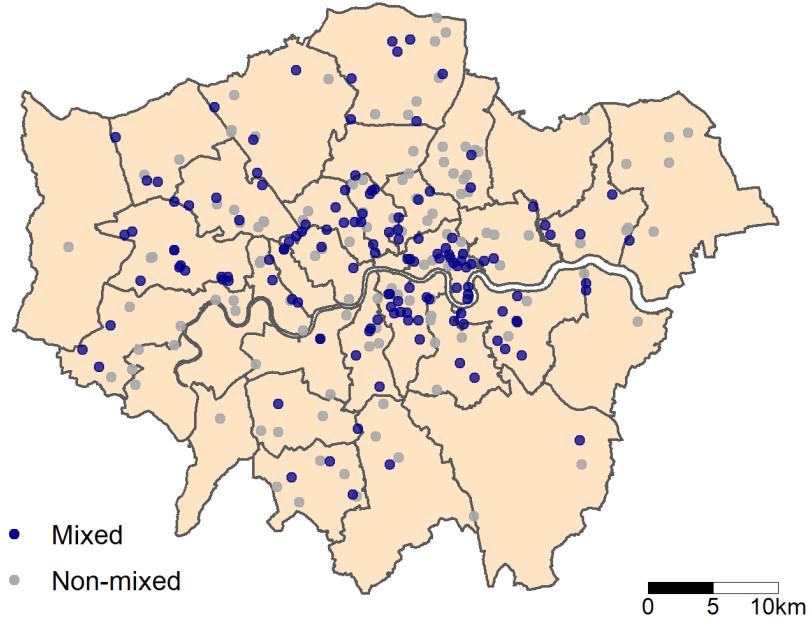
Watt, Paul, "Housing Stock Transfers, Regeneration and State-Led Gentrification in London," *Urban Policy and Research*, 2009, *27* (3), 229–242.

_ , "'It's not for us'," *City*, 2013, *17* (1), 99–118.

Zielenbach, Sean and Richard Voith, "HOPE VI and Neighborhood Economic Development: The Importance of Local Market Dynamics," *Cityscape*, 2010, *12* (1), 99–131.
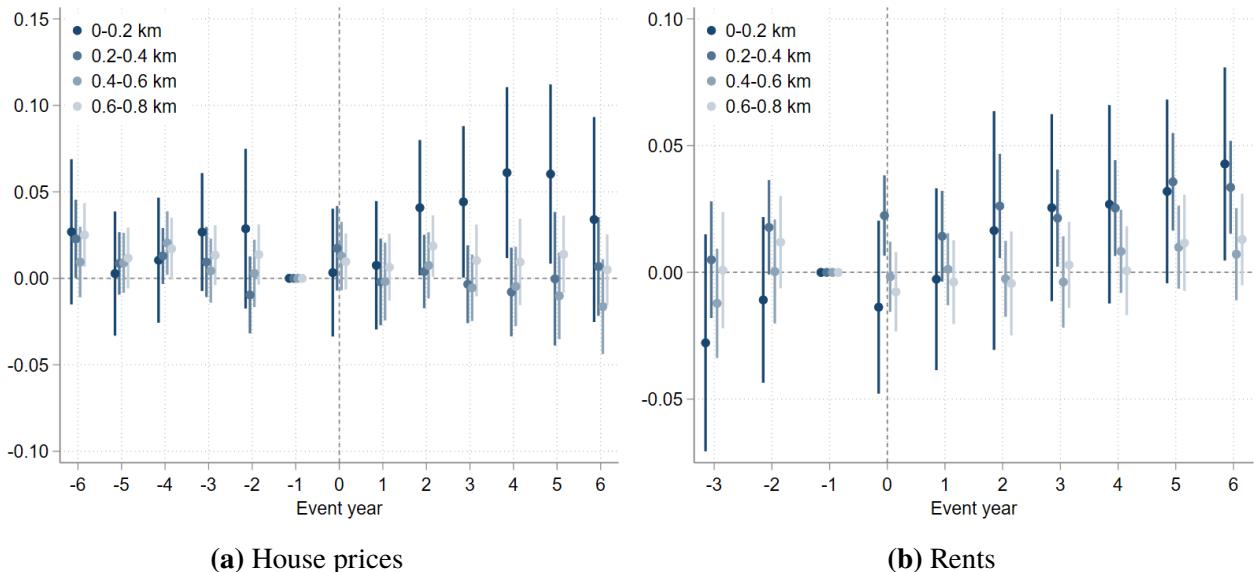
Figures

**Figure I:** Location of regenerations by income type
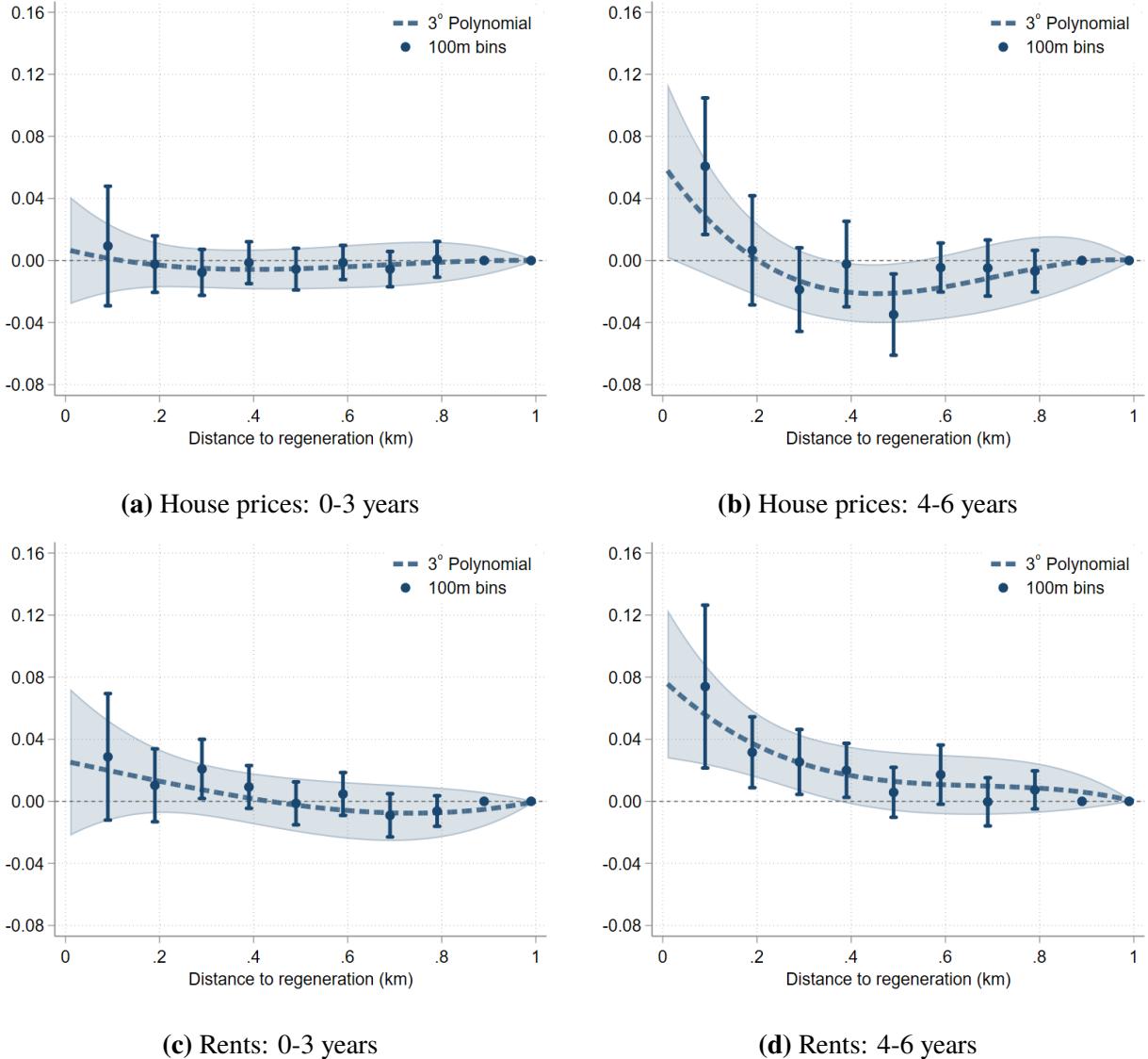
Note: The black lines delimit each local authority. Blue dots correspond to mixed-income regenerations, gray dots refer to estates regenerated as public housing only ("non-mixed").

Figure II: Effects of estate regenerations on house prices and rents

(a) House prices

(b) Rents
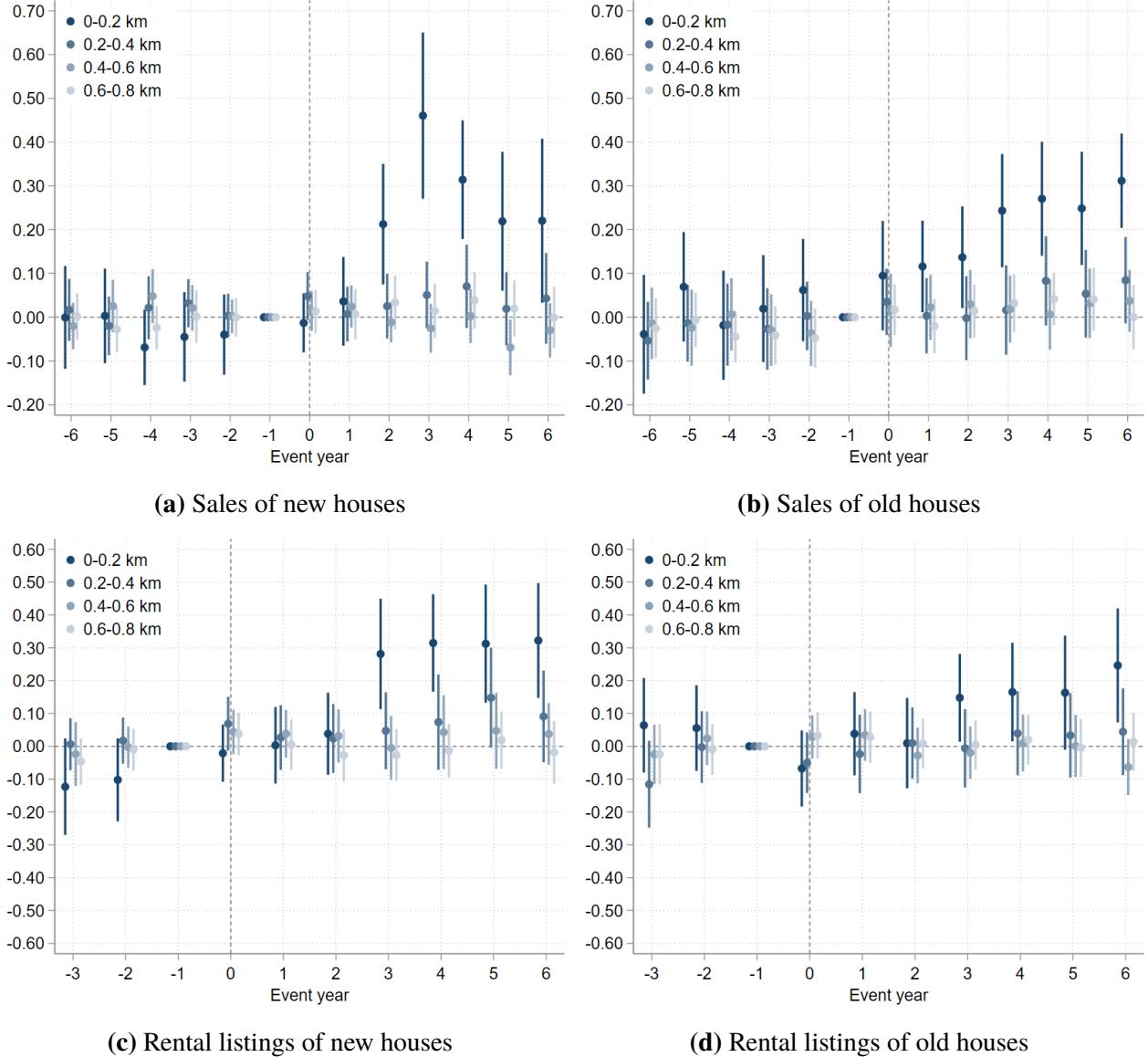
Note: The plots report coefficients $\beta_{\tau,r}$ in Eq. (1) for each concentric 200m ring. The omitted category is housing units within 0.8-1km of the regeneration. Panel (a) uses the balanced sample of estate regenerations with a permission approval in 2004-2012; panel (b) uses those with a permission approval in 2007-2012.

45

Figure III: Effects on house prices and rents with a continuous definition of distance
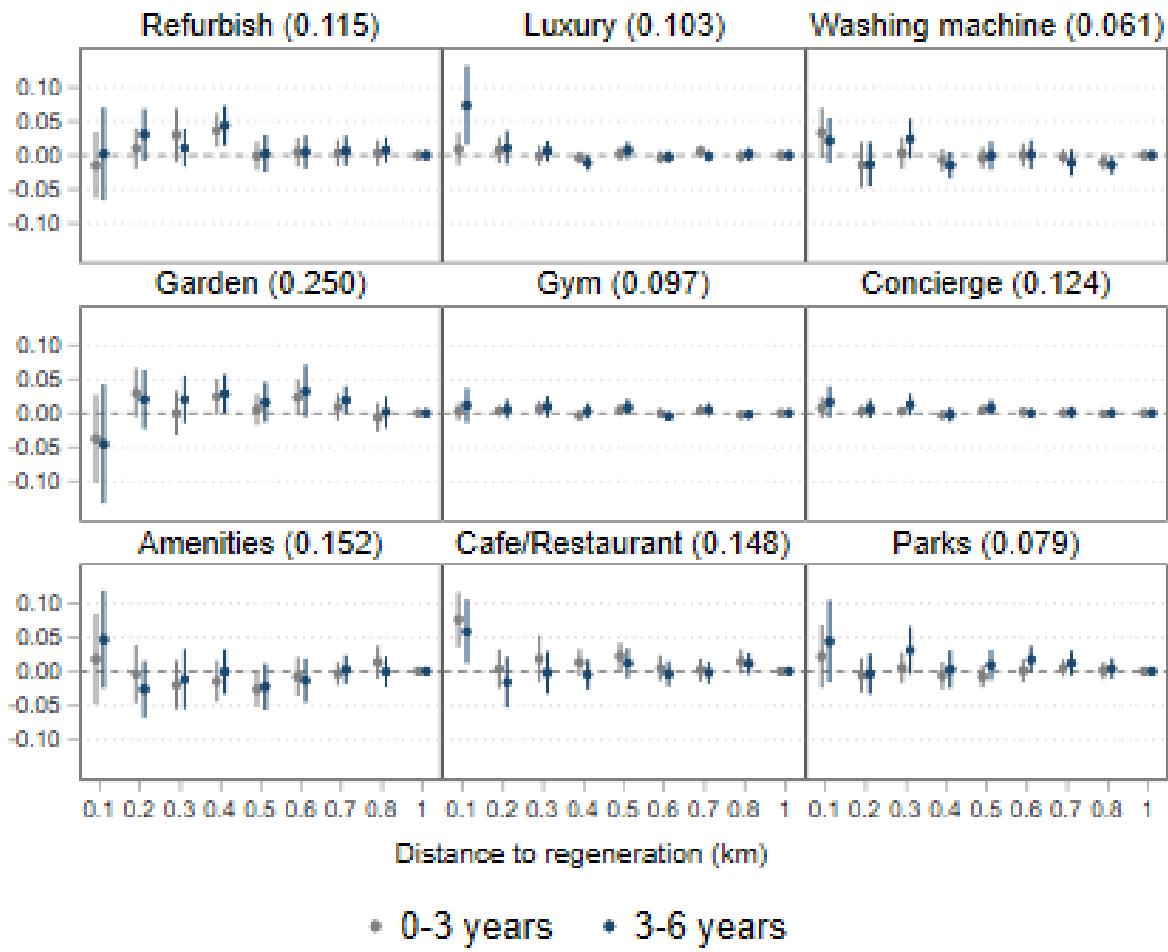
(a) House prices: 0-3 years

(b) House prices: 4-6 years

(c) Rents: 0-3 years

(d) Rents: 4-6 years

Note: The figure reports point estimates and 95% confidence intervals for coefficients $\theta_{0,r}$ (left panels) and $\theta_{1,r}$ (right panels) in Eq. (2) using 100m rings. The dotted line runs that same regression but using a 3rd order degree polynomial of the distance from each house sale to the regeneration site instead of rings. The shaded area indicates the corresponding 95% confidence interval. Panels (a) and (b) use the balanced sample of estate regenerations with a permission approval in 2004-2012; panels (c) and (d) use those with a permission approval in 2007-2012.

Figure IV: Effects of estate regenerations on house sales and rental listings

(a) Sales of new houses

(b) Sales of old houses

(c) Rental listings of new houses

(d) Rental listings of old houses
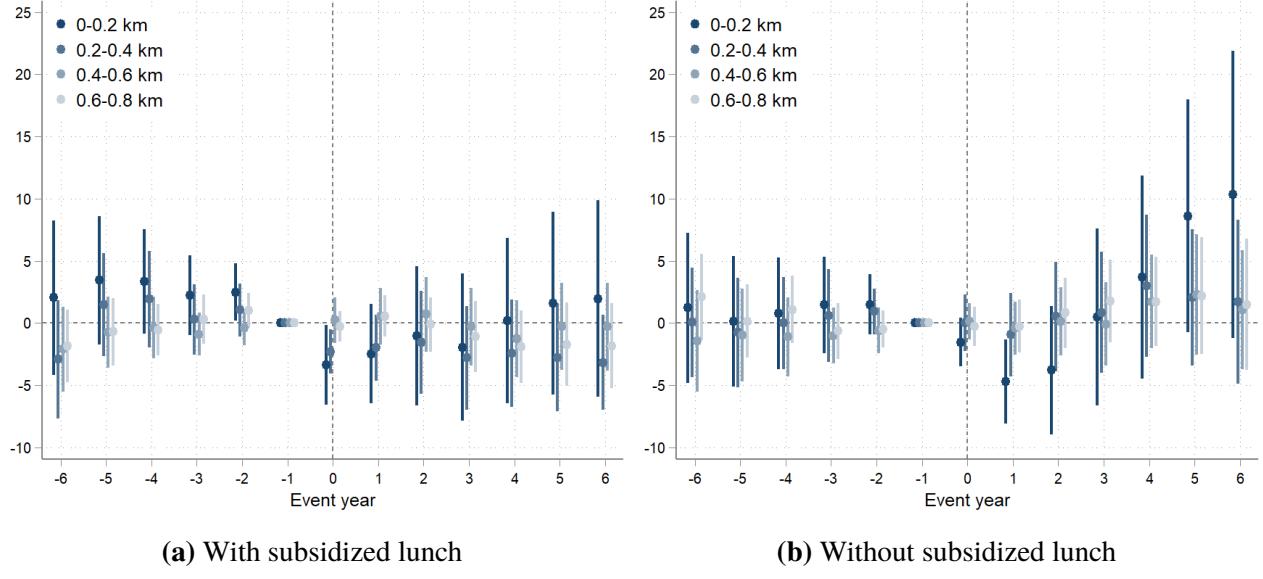
Note: The plots report coefficients $\beta_{\tau,r}$ in Eq. (1). For rental listings, we distinguish between "new" and "old" using text analysis on the description of the rental listing. Panels (a) and (b) use the balanced sample of estate regenerations with a permission approval in 2004-2012; panels (c) and (d) use those with a permission approval in 2007-2012.

Figure V: Effects on rental listings' description
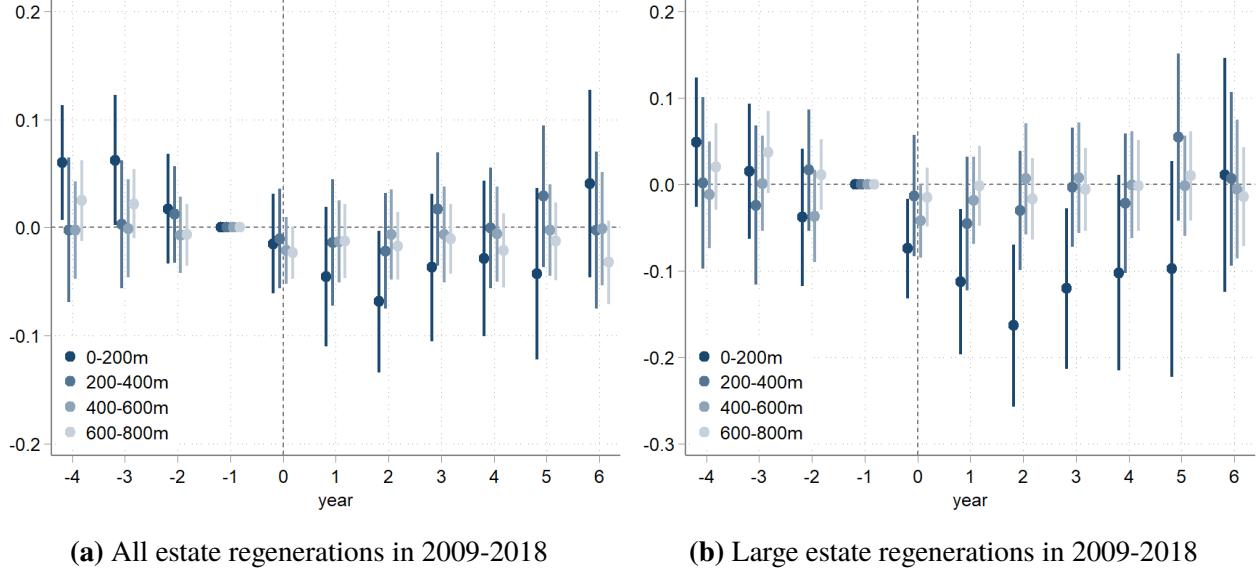
Note: Coefficients and related 95% confidence intervals are obtained by estimating Eq. (2) on the sample of rental listings using 100m rings. The plots use the balanced sample of estate regenerations with a permission approval in 2007-2012. Numbers in parenthesis report the pre-treatment period average of the variable for listings within 800m of regenerations.

Figure VI: Effects on the number of kids eligible/not eligible for subsidized lunch

(a) With subsidized lunch

(b) Without subsidized lunch
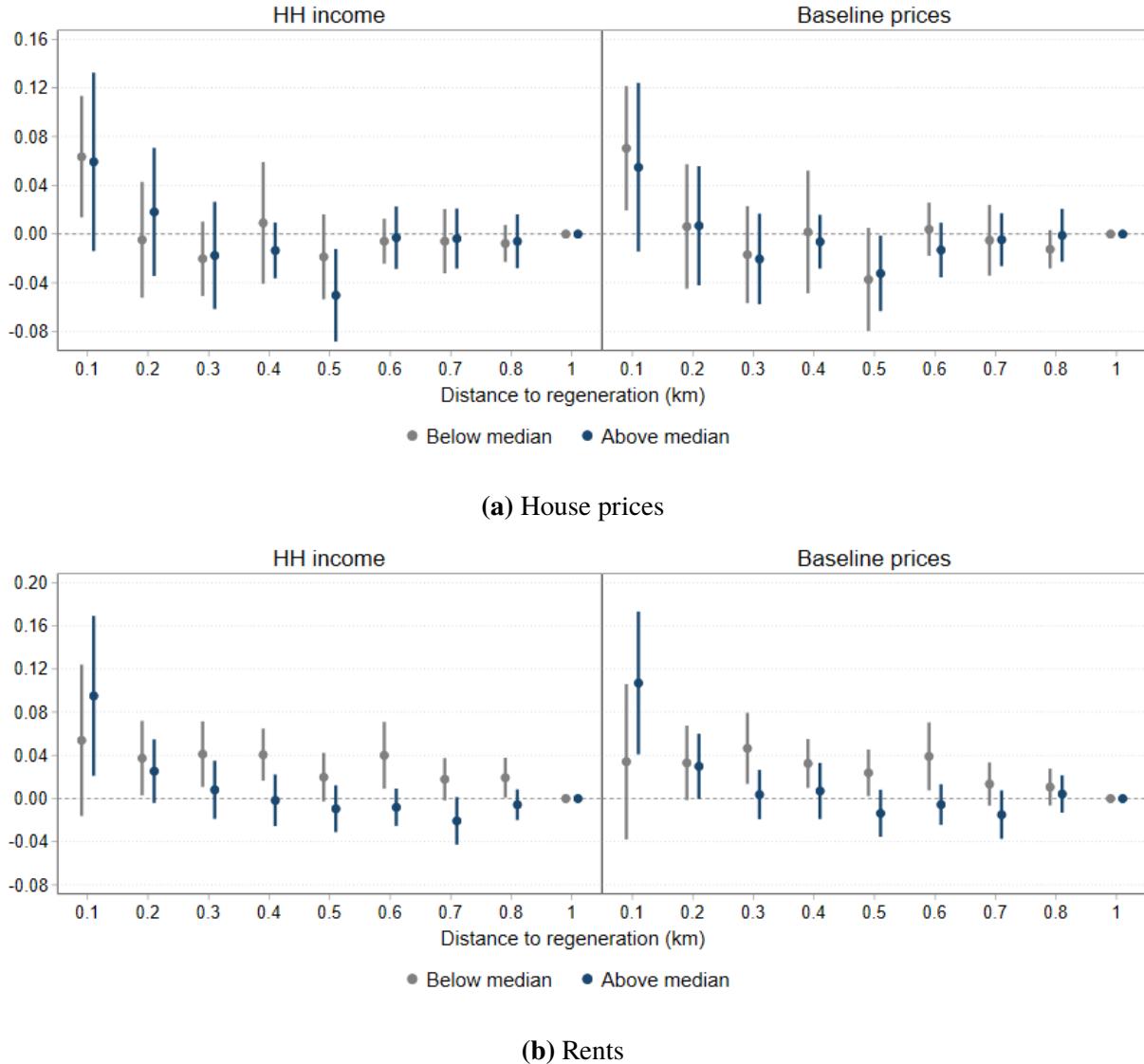
Note: The plots report coefficients $\beta_{\tau,r}$ and 95% confidence intervals in a block group version of Eq. (1). The plots use the balanced sample of estate regenerations with a permission approval in 2004-2012, and the sample period contains years from 2002 to 2016 –the sample is balanced between event years -2 and 4.

Figure VII: Effects on the total number of crimes

(a) All estate regenerations in 2009-2018

(b) Large estate regenerations in 2009-2018
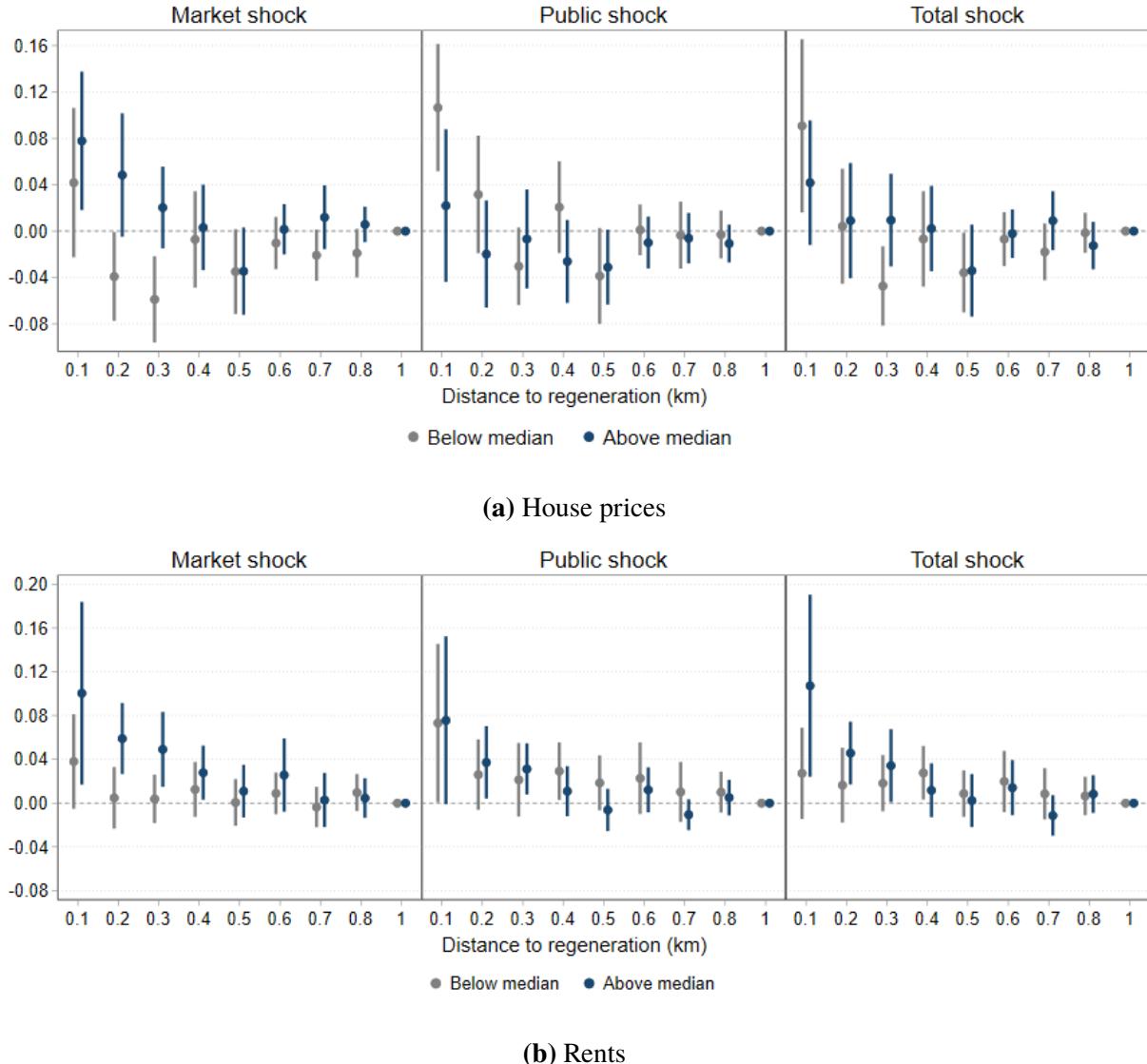
Note: This figure shows the evolution of the inverse hyperbolic sine of total crimes in a census block group around the permission year of a regeneration. Coefficients and related 95% confidence intervals are obtained by estimating a block group version of equation (1). The sample includes all regenerations with a permission between 2009 and 2018. "Large estates" are those with a number of existing public housing units above the median of this sample.

**Figure VIII:** Heterogeneity by neighborhood characteristics


(a) House prices

(b) Rents

Note: The plots report point estimates and 95% confidence intervals for coefficients $\theta^0_{1,r}$ (gray) and $\theta^1_{1,r}$ (blue) in Eq. (2) using 100m rings. Panel (a) uses the logarithm of house prices as an outcome on the balanced sample of estate regenerations with a permission approval in 2004-2012; panel (b) uses the logarithm of rents on regenerations with a permission approval in 2007-2012. Left plots use mean household income within 800m of the estate as the heterogeneity variable, right plots use the baseline house price index within 800m as constructed in Section 4.4.2.

Figure IX: Heterogeneity by the magnitude of the supply shock

(a) House prices

(b) Rents

Note: The plots report point estimates and 95% confidence intervals for coefficients $\theta_{1,r}^0$ (gray) and $\theta_{1,r}^1$ (blue) in Eq. (2) using 100m rings. Panel (a) uses the logarithm of house prices as an outcome on the balanced sample of estate regenerations with a permission approval in 2004-2012; panel (b) uses the logarithm of rents on regenerations with a permission approval in 2007-2012. The graphs use the market, public and total shock, respectively, as the heterogeneity variable.

Tables

Table I: Summary statistics of public housing regenerations

	(1) London	(2) Full sample	(3) Balanced
Panel A: Building characteristics			
Total units before		248	246
Public housing units before		206	194
Total units after		457	431
Public housing units after		197	208
Panel B: Δ Market-rate units/total units within X			
≤ 200m		0.41	0.32
≤ 400m		0.11	0.11
≤ 600m		0.05	0.05
≤ 800m		0.03	0.03
≤ 1,000m		0.02	0.02
Panel C: Neighborhood chars. (2001)			
Density (per ha)	108	151	136
High education	0.24	0.21	0.20
Unemployment	0.07	0.10	0.10
Public housing units	0.26	0.48	0.49
Owner-occupied units	0.55	0.35	0.35
Privately rented units	0.15	0.14	0.13
House price index	11.66	11.67	11.63
Household income	35,548	33,328	32,318
Census blocks/Estates	24,115	135	70

Note: Data in Panels A and B were obtained from the London Development Database; data in Panel C come from 2001 census data. Panel B is the average of the ratio between the change in market-rate units induced by the regeneration and the total number of housing units within several distances of regenerations. Neighborhood variables in Panel C are computed as the average of census blocks within 800m of the census block of reference weighted by population –consistent with our empirical strategy. The house price index (constructed as in Section 4.4.2) and household income use census block groups. The first column includes all blocks in London. Column 2 uses blocks for the full sample of estate regenerations, while column 3 uses a balanced sample of regenerations approved between 2004 and 2012.

Table II: Effects of regenerations on sales, listings and new construction

	ihs(house sales)		ihs(rental listings)		ihs(new construction)		prob(new construction)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	New	Old	New	Old	Public	Market	Public	Market
Panel A: 0-3 years								
0-200m	0.150***	0.103***	0.101**	-0.037	0.056*	0.063**	0.014*	0.016
	(0.037)	(0.035)	(0.045)	(0.038)	(0.031)	(0.030)	(0.008)	(0.011)
200-400m	0.023	0.025	0.036	-0.001	0.012	0.015	0.002	-0.001
	(0.022)	(0.022)	(0.036)	(0.038)	(0.015)	(0.022)	(0.004)	(0.008)
400-600m	-0.014	0.038*	0.034	0.009	0.005	0.015	0.002	0.005
	(0.014)	(0.019)	(0.031)	(0.029)	(0.013)	(0.016)	(0.003)	(0.007)
600-800m	0.023	0.038**	0.022	0.036	0.012	0.016	0.003	0.002
	(0.018)	(0.015)	(0.026)	(0.026)	(0.013)	(0.019)	(0.003)	(0.007)
Panel B: 4-6 years								
0-200m	0.193***	0.185***	0.278***	0.058	0.016	0.032	-0.002	-0.003
	(0.053)	(0.036)	(0.066)	(0.059)	(0.027)	(0.046)	(0.006)	(0.015)
200-400m	0.030	0.086***	0.099*	0.051	0.000	-0.005	-0.003	-0.002
	(0.035)	(0.026)	(0.059)	(0.047)	(0.016)	(0.026)	(0.005)	(0.011)
400-600m	-0.040*	0.040*	0.053	-0.010	-0.003	0.022	-0.003	0.006
	(0.022)	(0.020)	(0.047)	(0.032)	(0.016)	(0.024)	(0.004)	(0.010)
600-800m	0.023	0.052**	0.022	0.026	0.004	0.009	-0.000	0.000
	(0.021)	(0.022)	(0.037)	(0.035)	(0.014)	(0.020)	(0.004)	(0.008)
N	84,762	84,762	64,602	64,602	83,549	83,549	83,549	83,549
R-squared	0.29	0.64	0.58	0.80	0.15	0.25	0.14	0.25

Note: The table reports estimates of coefficients $\theta_{0,r}$ (Panel A) and $\theta_{1,r}$ (Panel B) in Eq. (2) using 200m rings for four dependent variables. Columns 1-2 use the inverse hyperbolic sine (ihs) of the number of house sales per year by new build status. Columns 3-4 use the ihs of the number of rental listings by status. Columns 5-6 use the ihs of the number of new units approved for construction by tenure type (public housing or market-rate), while columns 7-8 use the probability of any new construction by tenure type. Standard errors in parenthesis (clustered at the estate level). Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Online Appendix

A   Appendix

A.1   Data Appendix

A.1.1   House Prices and Rents: Coverage and Representativeness

The coverage of residential sales and rental listings in the data is comprehensive for our sample period. Fig. A.1 shows a histogram of the fraction of sales and listings per year. The plot shows a decrease in the number of sales around 2007 due to the Great Recession, while the number of listings is slightly increasing due to the increased popularity of online advertisements.

We limit the sample of residential sales and rental listings in several ways. In both cases, we drop sales and listings that are in the top and bottom 0.5% distribution of prices to decrease sensitivity to outliers. For rental listings, we make three further sample restrictions:

1. *Drop listings with more than 5 bedrooms*. The objective is making our results less sensitive to outliers and presumably very high-end properties.

2. *Drop listings with extreme values*. For every postcode-number of bedrooms combination, we drop listings priced more than 3 times the mean rent. These instances are likely to be reporting errors.

3. *Drop listings reflecting bedroom prices*. For each postcode-number of bedrooms combination, we drop listings with a rental price that is less or equal 1.25 times the mean rent divided by the number of bedrooms. We only do this for listings with 2 or more bedrooms. This restriction is intended to eliminate listings referring to a single room within a unit.

We find that the sample of rental listings is representative of private rents in London. To show this, we compare rents in the Rightmove dataset with official estimates of average private rents at the LA level from the Valuation Office Agency (VOA). Fig A.2 compares the 25th, 50th, 75th percentiles and the mean LA private rents for the first and third quarters of years 2011-2016. Rightmove rents are 10% higher than official estimates across all reported statistics.

The difference between Rightmove rents and official estimates is at least partially driven by the fact that Rightmove mostly reports asking rents as opposed to agreed rents (76% and 24%, respectively). To explore this, Table A.1 regresses the logarithm of the rent on a dummy variable indicating whether the rent is the agreed price (asking price is the omitted category). We first run this regression without any controls, then we add LA-year FE and, lastly, we add a bunch of unit and neighborhood characteristics. The table shows that agreed rents are on average 5-10% lower than asking rents, close to the difference between Rightmove rents and official estimates. This result suggests that Rightmove rents are a good representation of private rents in London and are not disproportionately skewed to the high-end of the distribution.

Figure A.1: Histograms of residential sales and rental listings

(a) Residential sales

(b) Rental listings
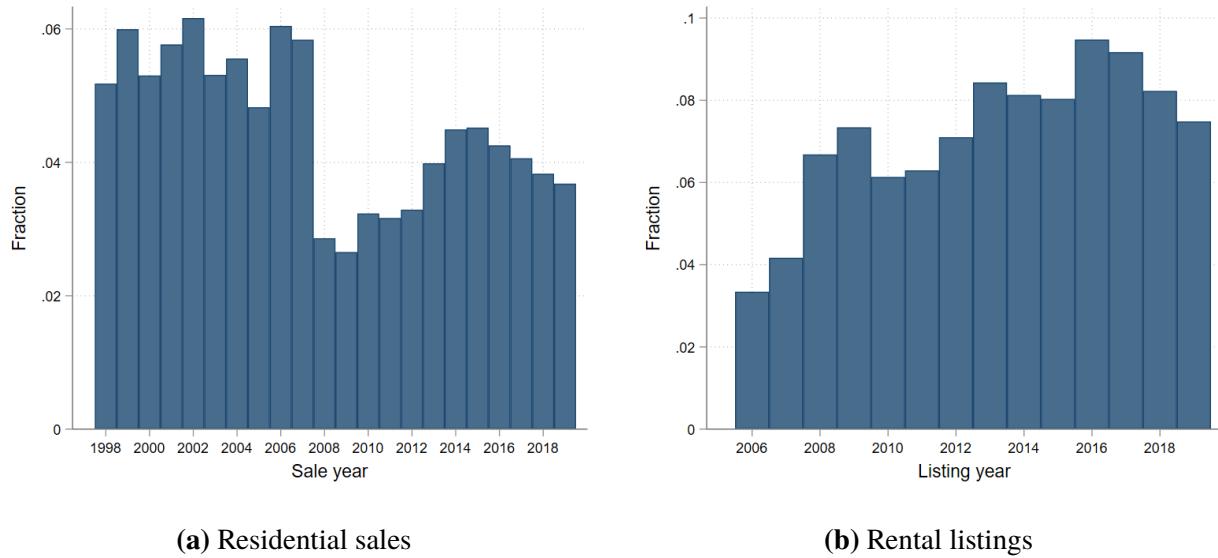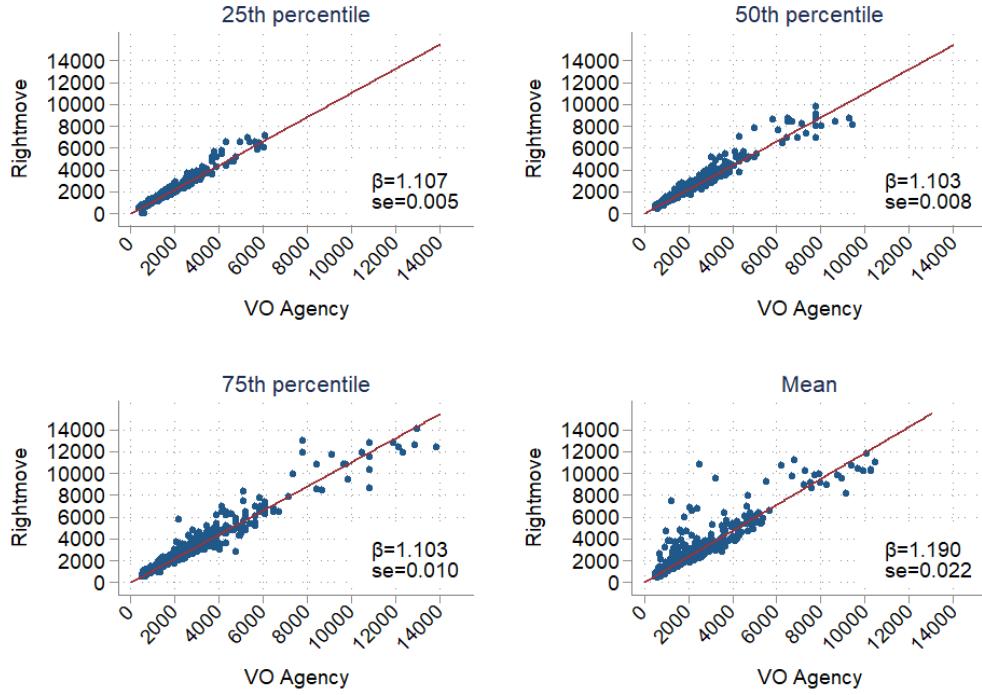
Figure A.2: Comparison of LA rents in Rightmove to rents in Valuation Office Agency (VOA)

Note: Scatter plot of several statistics from Rightmove and VOA at the LA level. Fitted lines are the result of a linear regression that does not include a constant.

Table A.1: Difference between asking and agreed rents (asking is omitted)

	(1)	(2)	(3)
Agreed rent	-0.103***	-0.066***	-0.047***
	(0.030)	(0.006)	(0.004)
House chars.	No	No	Yes
Census chars.	No	No	Yes
School chars.	No	No	Yes
Distance to tube	No	No	Yes
LA × year FE	No	Yes	Yes
N	4,826,481	4,826,481	4,817,825
Adjusted R-squared	0.01	0.38	0.70

Notes: The table shows the results from regressing the logarithm of the rental price on the rental price type (asking or agreed). The control variables that we use are equivalent to those used in Eq. (1). Standard errors are clustered at the LA level. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.1.2 Rental Listings' Description

To obtain a comprehensive picture of how rental housing characteristics evolve around regeneration, we scraped listings' descriptions using the website link in the dataset (95% have accessible links). Fig. A.3 is an example of a Rightmove rental listing in London. It usually provides the price, location, pictures and some key features. At the bottom of the listing, there is usually a description that provides more details of the advertised unit.

In many cases, agents describe not only properties of the units (bedrooms, new unit, bathrooms, etc), but also properties of the building and the neighborhood (amenities, cafés, trendy shops, vibrant). Using this, we created several variables related to these three categories. Table A.2 provides the relation of keywords to several of these variables: when any of the keywords are present in the description, the variable takes value 1; otherwise, it takes value 0.

Figure A.3: Example of rental listing's description

Table A.2: Relation of keywords in listings' descriptions

Variable	Keywords
Panel A: Unit characteristics	
New	brand new, new build, new construct, new develop
Refurbished	refurbish, renovat, rehabilitat, reform, upgrad
Luxury	luxur, deluxe
Washing machine	washing machine
Panel B: Building characteristics	
Garden	garden, courtyard, backyard, patio
Gym	gym, fitness
Concierge	concierge
Panel C: Neighborhood characteristics	
Amenities	amenities
Cafe	café, cafe, coffee
Restaurant	restaurant
Parks	park, green space

A.2 Main Results: "Public Housing Only" Regenerations

As we explain in Section 2.2, some public housing estates were regenerated by including only public housing units in the new building (henceforth "non-mixed"). However, Table A.3 shows that these estates are not directly comparable to the sample of mixed-income regenerations. First, non-mixed regenerations were much smaller in size (77 units versus 248). Since the distribution of units in the existing building does not overlap enough, we cannot use non-mixed regenerations as a counterfactual for mixed-income regenerations. Second, they were located in observably different neighborhoods of the city. Non-mixed regenerations were in less denser areas with less public housing, less renter households and much lower housing prices –presumably because they were more likely to be located in Outer London.

Despite this, we report the main results for non-mixed regenerations following our first empirical method, which uses housing units within 800-1,000m of the estate as a comparison group. In particular, Fig. A.4 estimates Eq. (2) for the logarithm of house prices and rents using 100m bins and a third-order degree polynomial to indicate distance to the estates. Table A.4 estimates the same equation for the inverse hyperbolic sine of the number of sales, rental listings and new construction.

The price effects of non-mixed regenerations are very different in the sales and rental markets. In the sales market, house prices do not react to the regeneration announcement –similarly to mixed-income regenerations–, but later drop by 8% within 100m of the estate. In contrast, rents rise by about 4% within right from the permission approval. Both markets are only affected in the imme-diately surrounding area (100m), which is consistent with the fact that these regenerations were smaller in size and, hence, had less potential to change the neighborhood. A potential explanation for the opposite effects in these markets is that unobservable quality aspects of sold units changes as a result of the regeneration, i.e. the lowest-quality units near the estates are sold.

Similarly, there are contrasting effects in the number of sales and rental listings. When examin-ing the market for old units, the number of sales increases by 10% within 200m after the regeneration is approved while the number of rental listings decreases by a similar percentage. This result indi-cates that there might be some substitution between the sales and rental markets: landlords sell their

units and buyers stay in the new apartments. In both markets, the effects on the quantity of sales and listings of new units are zero –although it decreases slighlty for rental listings in the long-run.
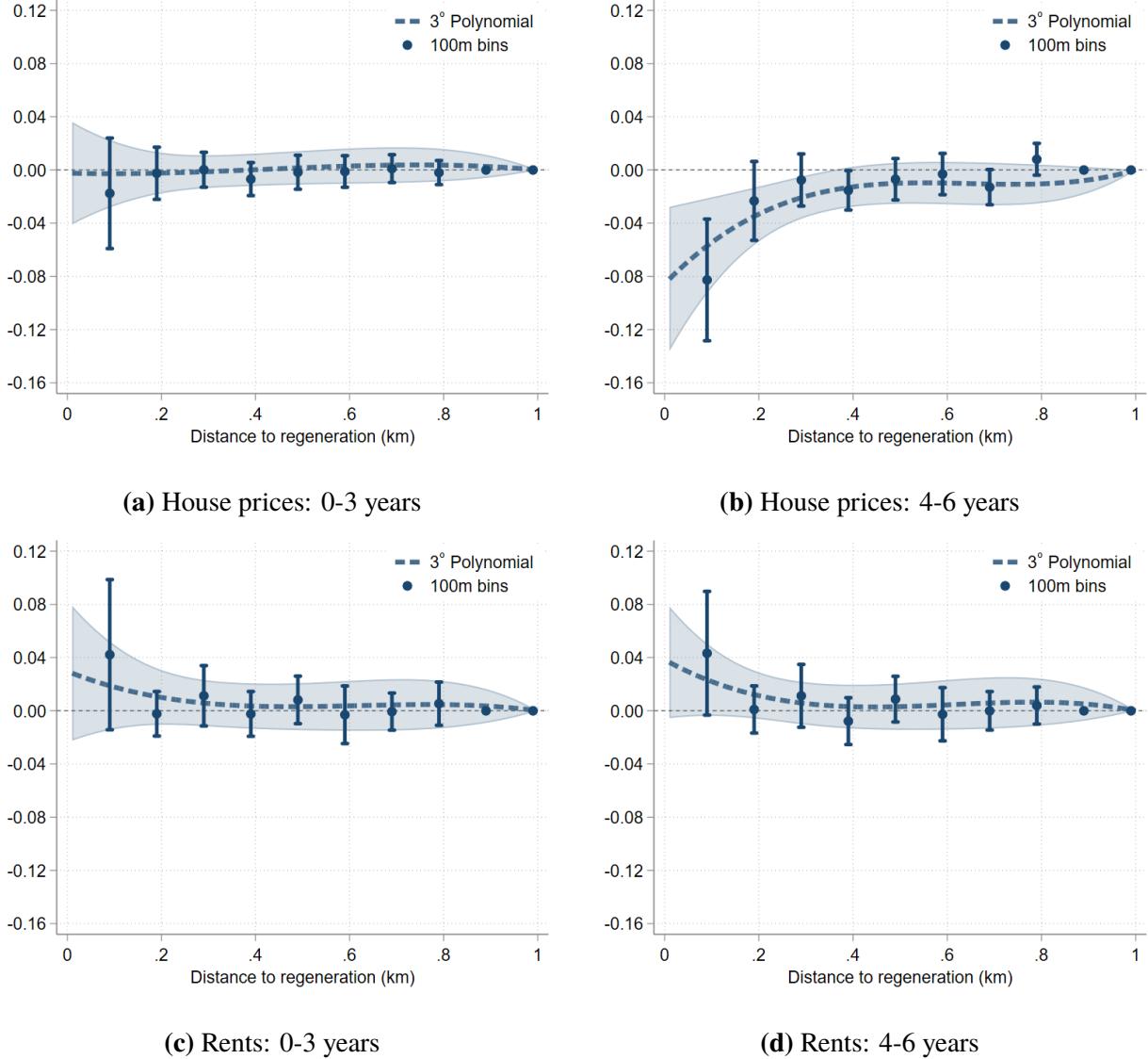
Finally, we find suggestive evidence that non-mixed regenerations are partially crowding out the construction of public housing in the short run. Columns 5 and 7 of Table A.4 show that the number of newly approved public housing units decreases by 5% within 200m for the first three years and that the probability of approving new public housing units decreases by 1.2 p.p..

Table A.3: Summary statistics of public housing regenerations

	London	Mixed-income		Non-mixed	
	(1)	(2)	(3)	(4)	(5)
	All blocks	Full	Balanced	Full	Balanced
Building characteristics					
Total units before		248	246	77	60
Public housing units before		206	194	75	60
Total units after		457	431	76	72
Public housing units after		197	208	73	70
Neighborhood chars. (2001)					
Density (per ha)	108	151	136	124	136
High education	0.24	0.21	0.20	0.19	0.20
Unemployment	0.07	0.10	0.10	0.09	0.09
Public housing units	0.26	0.48	0.49	0.39	0.38
Owner-occupied units	0.55	0.35	0.35	0.44	0.45
Privately rented units	0.15	0.14	0.13	0.13	0.14
House price index	11.66	11.67	11.63	11.54	11.56
Household income	35,548	33,328	32,318	31,709	31,915
Census blocks/Estates	24,115	135	70	122	78

Note: The table reports a subset of the same variable than in Table I.

Figure A.4: Effects on house prices and rents with a continuous definition of distance

(a) House prices: 0-3 years

(b) House prices: 4-6 years

(c) Rents: 0-3 years

(d) Rents: 4-6 years

Note: The figure reports point estimates and 95% confidence intervals for coefficients $\theta_{0,r}$ (left panels) and $\theta_{1,r}$ (right panels) in Eq. (2) using 100m rings. The dotted line runs that same regression but using a 3rd order degree polynomial of the distance from each house sale to the regeneration site instead of rings. The shaded area indicates the corresponding 95% confidence interval.

Table A.4: Effects of regenerations on sales, listings and new construction

	ihs(house sales)		ihs(rental listings)		ihs(new construction)		prob(new construction)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	New	Old	New	Old	Public	Market	Public	Market
Panel A: 0-3 years								
0-200m	0.019	0.091***	-0.020	-0.131***	-0.052**	-0.015	-0.012**	0.002
	(0.025)	(0.031)	(0.031)	(0.038)	(0.020)	(0.025)	(0.005)	(0.012)
200-400m	0.007	0.045**	-0.016	-0.043	0.007	0.049***	0.001	0.026***
	(0.017)	(0.020)	(0.029)	(0.036)	(0.015)	(0.017)	(0.004)	(0.007)
400-600m	0.005	0.010	-0.020	-0.009	0.012	0.017	0.002	0.009
	(0.015)	(0.017)	(0.024)	(0.031)	(0.013)	(0.012)	(0.003)	(0.007)
600-800m	0.012	-0.007	0.011	-0.004	-0.006	0.004	-0.002	0.006
	(0.015)	(0.016)	(0.021)	(0.026)	(0.010)	(0.015)	(0.003)	(0.007)
Panel B: 4-6 years								
0-200m	-0.023	0.096***	-0.086**	-0.094*	-0.024	-0.009	-0.005	0.006
	(0.022)	(0.036)	(0.042)	(0.048)	(0.020)	(0.026)	(0.006)	(0.013)
200-400m	-0.001	0.029	0.016	-0.043	-0.001	0.011	0.001	0.009
	(0.018)	(0.026)	(0.031)	(0.036)	(0.017)	(0.025)	(0.005)	(0.009)
400-600m	-0.013	0.009	-0.041	-0.071**	0.015	0.015	0.002	0.003
	(0.015)	(0.022)	(0.030)	(0.033)	(0.015)	(0.019)	(0.004)	(0.008)
600-800m	0.006	0.018	0.007	-0.029	-0.006	0.006	-0.002	0.011
	(0.013)	(0.019)	(0.029)	(0.028)	(0.011)	(0.018)	(0.003)	(0.008)
N	86,784	86,784	58,269	58,269	84,155	84,155	84,155	84,155
R-squared	0.25	0.63	0.51	0.78	0.14	0.24	0.13	0.24

Note: The table reports estimates of coefficients $\theta_{0,r}$ (Panel A) and $\theta_{1,r}$ (Panel B) in Eq. (2) using 200m rings for different dependent variables. Columns 1-2 use the inverse hyperbolic sine (ihs) of the number of house sales per year by new build status. Similarly, columns 3-4 use the ihs of the number of rental listings by status. Columns 5-6 use the ihs of the number of new units approved for construction by tenure type (public housing or market-rate), while columns 7-8 use the probability of any new construction by tenure type. Standard errors in parenthesis. Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.3   Cost Effectiveness of Regenerations: Calculation Details

In this section, we describe the steps to obtain the estimates in Table C.4, which computes the benefits and costs for regenerations with a permission approved between 2004 and 2012. All of our calculations are expressed in benefits/costs per regenerated public housing unit in the old building. Note that we deflate all estimates to 2001 prices using the Consumer Price Index of all items in the UK from FRED data.[58] Following Hendren and Sprung-Keyser (2020), we also use a discount rate of 0.03 when computing the net present discounted value (NPDV) of benefits and costs –we consider the NPDV at the time of permission approval and that regenerations take 4 years to complete.

A.3.1   Benefits

We consider the following concepts:

1. *House price increases*. We divide the aggregate effects on house prices within 100m as calculated in Table C.1 by the number of public housing units in the existing buildings.

2. *Rent increases*. We reproduce the calculation in Table C.1 for the NPDV of the change in all future rents within 400m (using 100m ring estimates). We use 2-bedroom rental listings in years 2006 to 2008 to construct baseline rents (deflated to 2001 prices). After converting monthly rents to annual rents, we multiply estimated rent increases within each 100m ring by the number of privately rented units in that ring, calculate the sum for the four rings and divide it by the number of regenerated public housing units.

3. *Children's future earnings*. We use the estimates in Neri (2020) to translate the effects of regenerations on nearby primary school-age children's test scores to future earnings. We closely follow the computation in Hendren and Sprung-Keyser (2020).
First, we obtain the lifecycle earnings for the average person in London. We use Table 6.7a of the UK's Annual Survey of Hours and Earnings (ASHE), where the mean earnings are reported by age group (18-21, 22-29, 30-39, 40-49, 50-59, 60+). We obtain average earnings at every age by fitting a fourth-order polynomial to a dataset that assigns the mean earnings of each income group to the midpoint age in that group. In this exercise, we assume that individuals earn income only in ages 18-65.
Second, we compute the number of primary school-age children exposed to regenerations as

---

[58]https://fred.stlouisfed.org/series/GBRCPIALLMINMEI

those living within 1km of the regeneration in 2002. We assume that the number of children of every age between 5 and 11 within 1km is the same at the moment of completion of the regeneration process. For every age and completion year, we estimate the NPDV at the moment of permission of future earnings assuming a wage growth of 0.5% per year, as is assumed in Hendren and Sprung-Keyser (2020). Finally, we aggregate the total NPDV of future earnings of all children within 1km of a regeneration and divide it by the number of public housing regenerated units.

A.3.2   Costs

We include the following mechanical costs of regeneration:

1. *Demolition costs*. The cost of demolishing a public housing unit includes the cost of physically demolishing the building, home loss and disturbance costs, and buying the remaining private units in the building (previously bought through the RTB scheme). We obtain the demolition cost estimates from Power (2008), which is around £17,500-35,000 per unit in 2006 –we take the upper bound. We place the value of home loss and disturbance at £8,900 in 2018 –from a research report for the regeneration of a specific estate, Aylesbury estate.[59] For buying RTB units, we estimate the average value of old units within 800m of any estate in 2001 and adjust it by the ratio of RTB units to public housing units in the old building.

2. *New construction costs*. Official estimates are not available, thus, we draw on research reports to estimate the construction costs for the government. Since the financing of new units varies from estate to estate, we consider two different scenarios. On the one hand, we consider that the government pays a flat fee of £100,000 per regenerated unit that stays at social rent (71%) and £38,000 for other rent levels (in 2018 pounds).[60] On the other hand, we consider that the government pays for the full cost of new construction, which might range from £145,500 to £305,000 per unit (in 2016 and 2018 pounds, respectively).[61] We adjust these quantities by multiplying them by the ratio of public housing units in the new relative to the old building.

3. *Relocation costs*. We assume that the cost of relocating one family is equal to the rental price of a 2-bedroom apartment within 800m of a regeneration from the permission to the average completion year. To implement this, we compute the average rent of a 2-bedroom apartment of regenerations taking place between 2007 and 2012 –balanced sample for rental outcomes–

---

[59]"The Costs of Estate Regeneration: A Report by Architects for Social Housing", by Architects for Social Housing (ASH)

[60]Source: Mayor of London, *"Building Council Homes for Londoners"*, Funding Prospectus, May 2018. These quantities are grants that LA can obtain from the Greater London authority.

[61]Sources: "Completing London's Streets", by Savills UK (Research Report to the Cabinet Office) and ASH

and adjust it downwards by 7.5% if it is an asking rent –based on Table A.1. We weight the regeneration-specific average rents by the number of public housing units in the old building and take the NPDV in the permission year.

We subtract the following tax savings:

1. *Council tax savings*. We compute the NPDV of the future stream of new council tax revenues of market-rate units in the new building. The council tax is a lump-sum tax on domestic property. Each property is assigned a council tax band depending on the value of the housing unit at 1991 prices –there are eight bands in total.
   First, we compute the mean council tax rate per band across LAs, weighted by the number of market-rate units in regenerated buildings in each LA. Second, we deflate to 1991 prices all sales of new units taking place in regenerated blocks from years 0 to 6 relative to permission. Third, we apply the corresponding mean council tax rate to each sale according to their council tax band. Fourth, we compute the aggregate NPDV of all future revenues. Finally, we express this number in terms of pounds per regenerating units. We first multiply it by the ratio of the change in total market-rate units in the building to the number of observed new unit sales in order to reflect all new market-rate units –rental units included. Then, we divide this number by the number of regenerated public housing units.

2. *Stamp duty land tax savings*. We compute the NPDV of the stamp duty land tax (analogous to a property tax), which is imposed on the purchase of land and properties with values over a certain threshold. To do this, we apply the tax to all sales of new units in regenerated blocks according to their value –we use the rates just before July 2020. We aggregate these quantities, compute the NPDV in the permission year, and divide it by the number of regenerated public housing units.

B Figures

Figure B.1: The regeneration of the Meredith Tower in West London
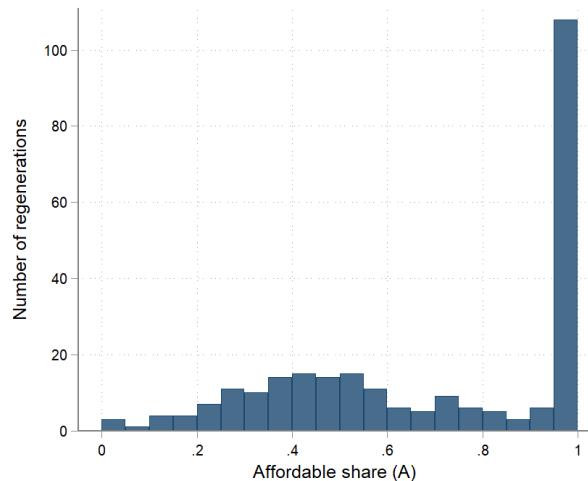

(a) Existing building
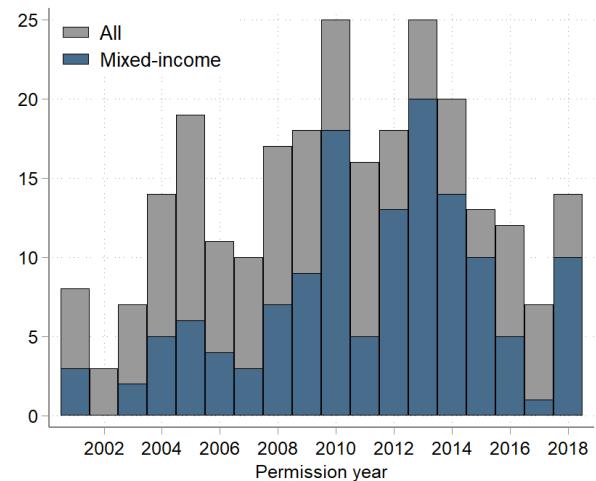
(b) New building

Note: This figure shows an example of a regeneration program carried out in West London. Panel A shows the building slated for demolition; Panel B shows a digital rendering of the new building constructed on site.

**Figure B.2:** Histograms of public housing share in the new building and timing
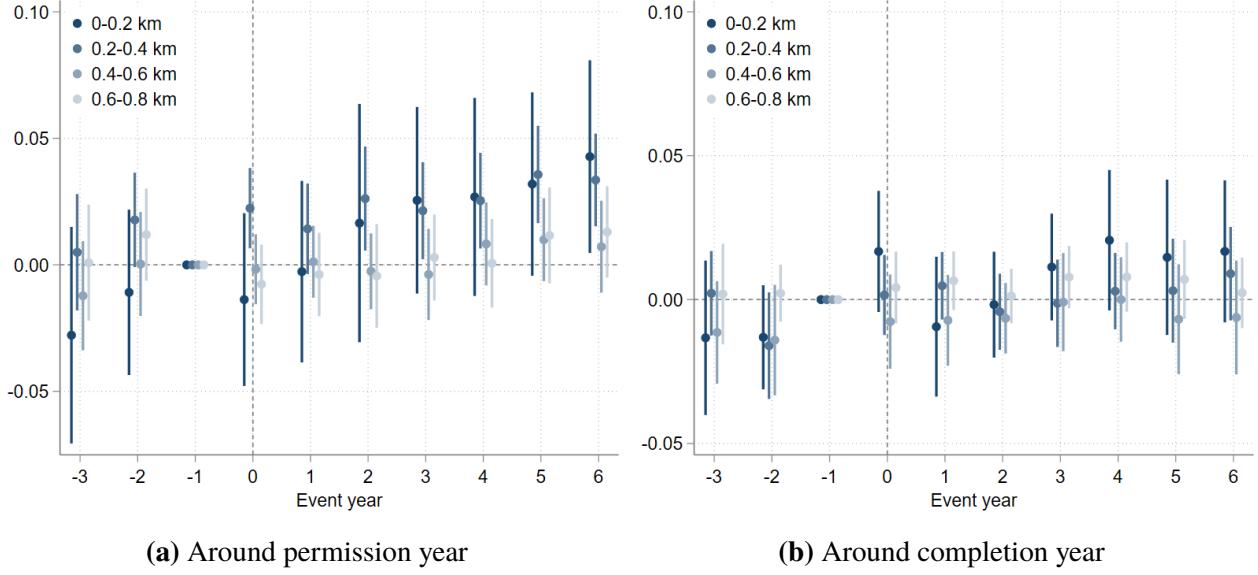
(a) Share of public housing - new building

(b) Estate regenerations by year
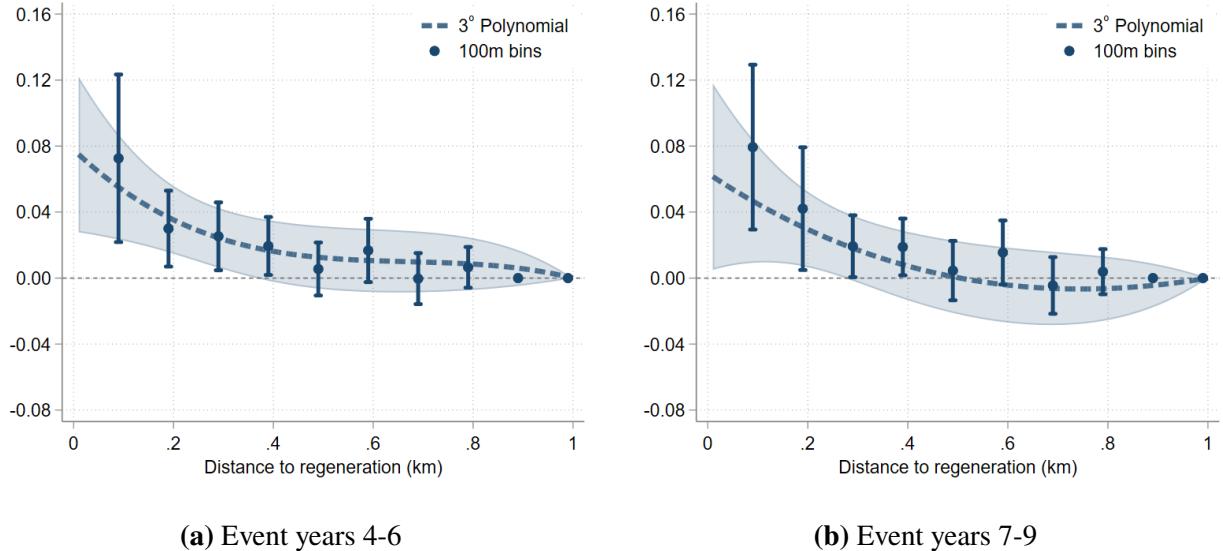
Note: The plots use the sample of estates regenerated between 2001 and 2018.

66

Figure B.3: Effects on rents by choice of treatment period

(a) Around permission year

(b) Around completion year
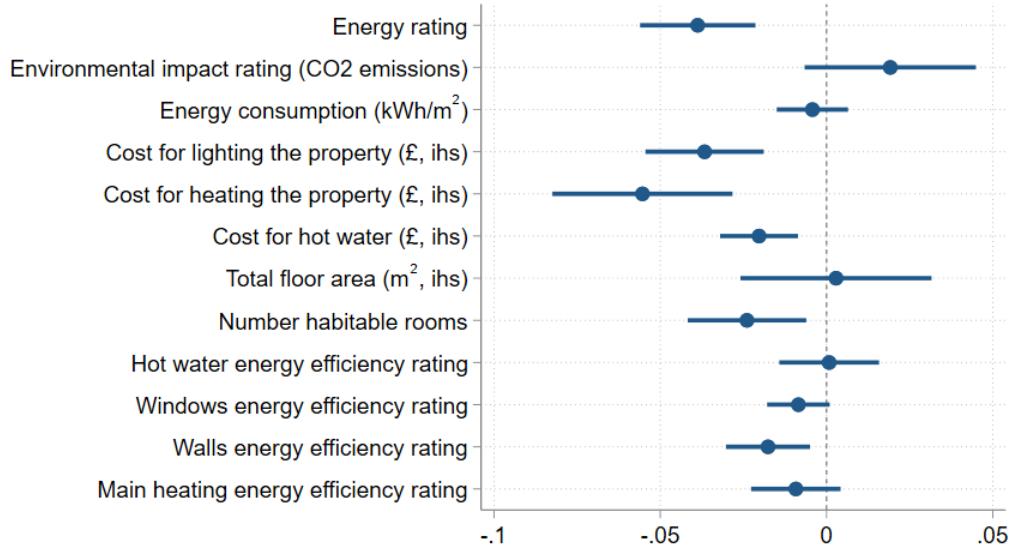
Note: The plots report coefficients $\beta_{\tau,r}$ in Eq. (1). Both plots use the sample of estate regenerations in 2007-2012.

Figure B.4: Long-run effects of estate regenerations on rents

(a) Event years 4-6

(b) Event years 7-9
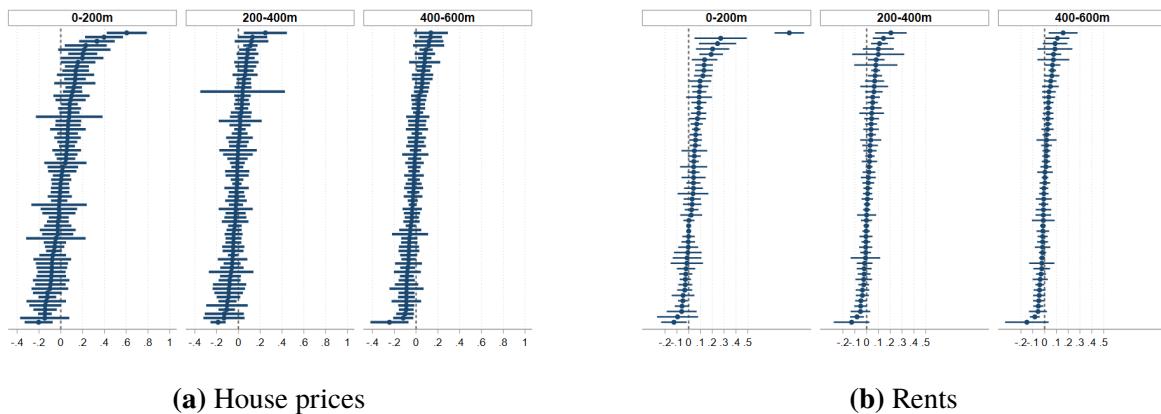
Note: The plots reproduce Fig. III, by estimating Eq. (2) adding an interaction with the dummy variable $\text{Post}_{et}^{7\text{-}9}$ in the summatory, which indicates transactiones taking place in years 7 to 9 after permission.

Figure B.5: EPC differences between rental and owner-occupied units at baseline
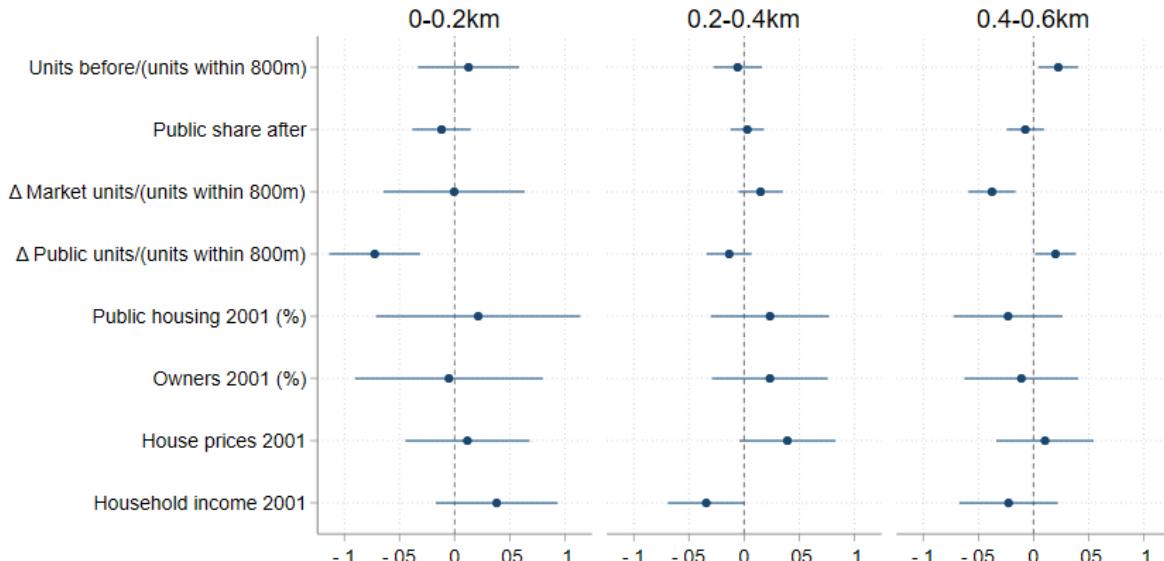
Note: The plot regresses a dummy variable indicating whether a property is rented (vs. owner-occupied) on several unit characteristics as reported in Energy Performance Certificates (EPC). "ihs" indicates that we use the inverse hyperbolic sine transformation of the variable. Energy ratings go from A to G, and we transform it into integers going from 7 to 1 –higher numbers denote higher energy efficiency. Energy efficiency ratings in the last four rows are also reported in five categories ("Very good", "Good", "Average", "Poor", "Very poor") that we transform in a similar way. For the regression, we standardize all variables by subtracting their mean and dividing by their standard deviation. The sample includes all owner-occupied and rental units that were issued an EPC three to one years before the corresponding permission approval for regeneration and were located within 800m of a regeneration approved between 2009 and 2012. The regression includes estate fixed effects and standard errors are clustered at the estate level.

Figure B.6: Price effects by regeneration and ring, 4-6 years after permission

**(a)** House prices

(b) Rents
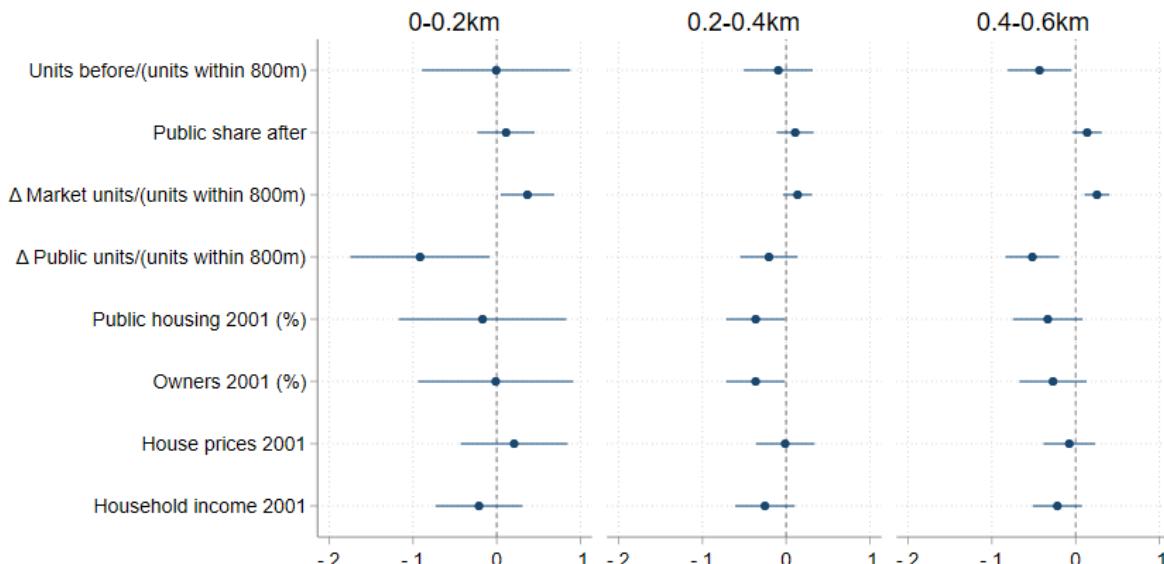
Note: The figure reports point estimates and 95% confidence intervals for coefficient $\theta_{1,r}$ in Eq. (2) using 200m rings and ran separately for each regeneration. Estimates are sorted from lowest to highest for each separate bin.

**Figure B.7:** Correlation of regeneration-specific price effects with observables
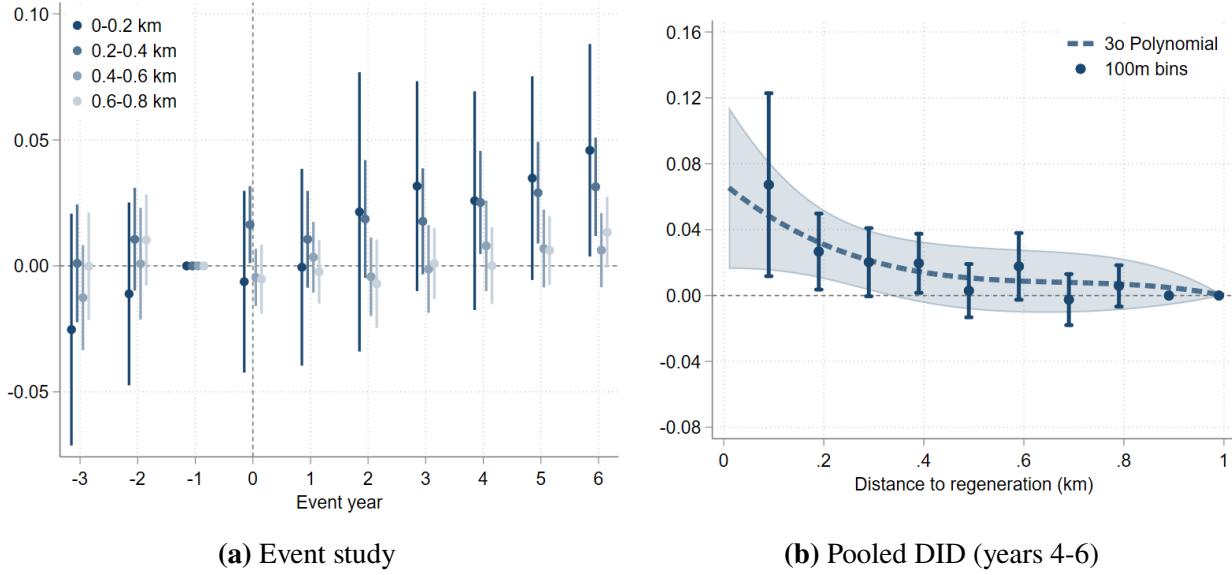
(a) House prices (comparison: 0.8-1km ring)

**(b)** Rents (comparison: 0.8-1km ring)
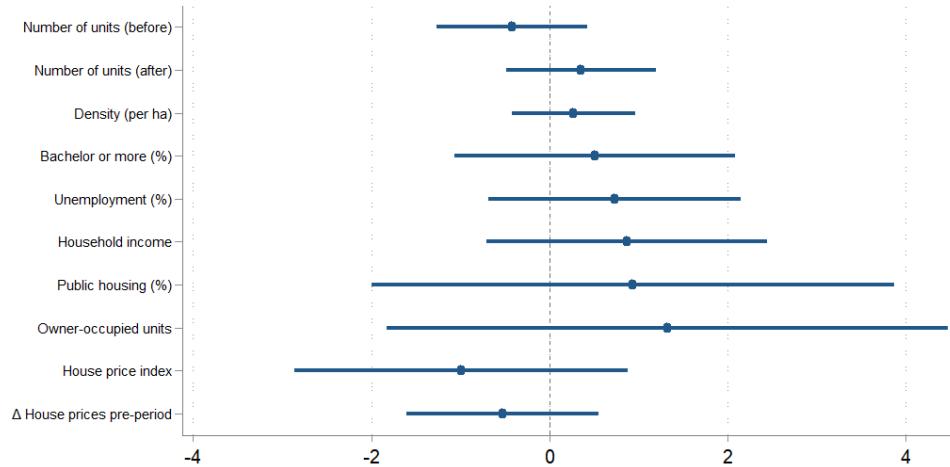
Note: This plot regresses the coefficients for each ring in Fig. B.6 on building and neighborhood characteristics.

Figure B.8: Quality-adjusted effects of estate regenerations on rents

**(a)** Event study

(b) Pooled DID (years 4-6)
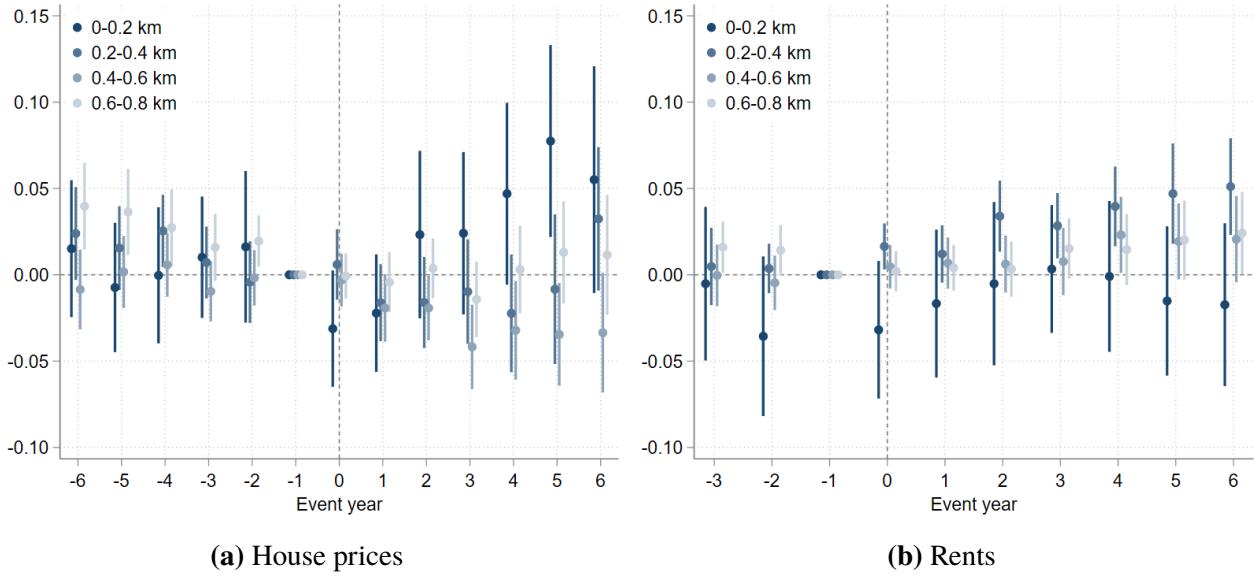
Note: Panel (a) and panel (b) reproduce Fig. II (panel (b)) and III (panel (d)), respectively, including as controls indicators for the presence of the keywords "refurbish", "luxury", "washing machine", "gym", "garden" and "concierge" in a listing's description. Both panels use the sample of estate regenerations with a permission approval in 2007-2012.

**Figure B.9:** Random timing of estate regenerations
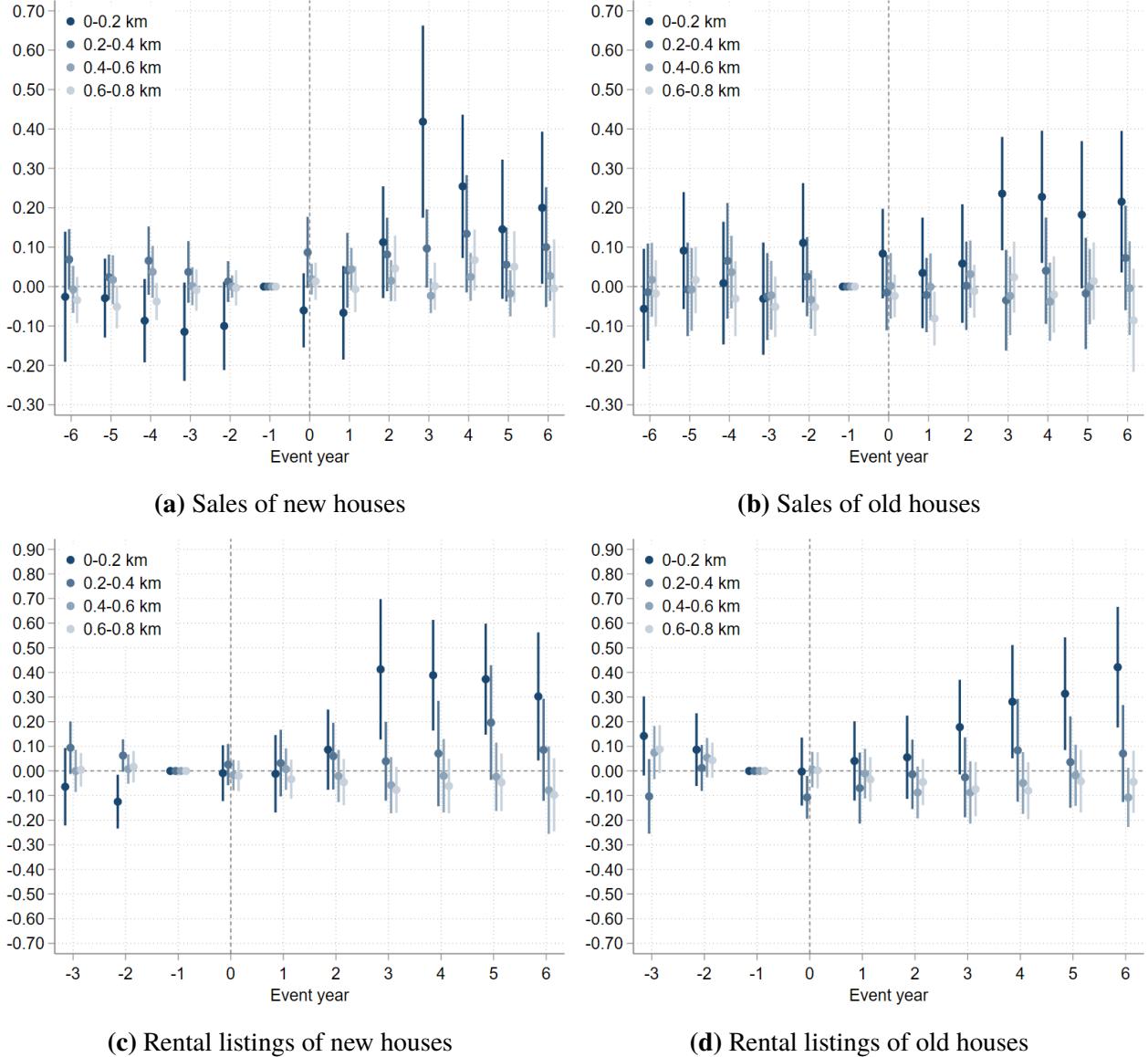
Note: The plot shows the results from a regression of the announcement year on a series of regeneration (first two variables) and neighborhood characteristics in 2001 using the sample of regenerations with a permission approval in 2004-2018. Regeneration characteristics are measured either for the building slated for demolition (before) or for the new development (after). Neighborhood characteristics are constructed as the average of the variable of census block groups within 800 of the estate. The house price index refers is a proxy for baseline house prices in 2001 and is constructed as detailed in Section 4.4.2. The change in house prices in the pre-period is a proxy for rising prices and gentrification, and is constructed analogously for periods 1998-2000 and 2001-2003 –the change is defined as the difference between these two periods. All variables used as regressors are standardized.

**Figure B.10:** Effects of estate regenerations on house prices and rents (using timing variation)

(a) House prices

(b) Rents
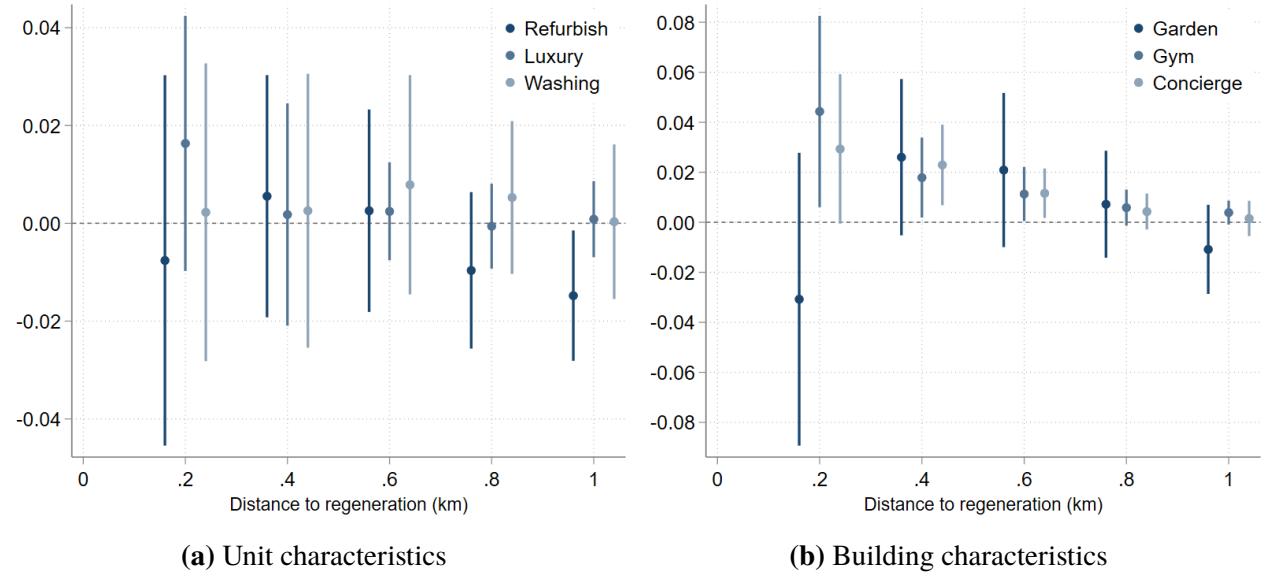
Note: The plots report coefficients β_τ in Eq. (3) for each concentric 200m ring. The omitted category is housing units within the same distance ring of regenerations approved more than two years later. Panel (a) uses the sample of estate regenerations with a permission approval in 2004-2012; panel (b) uses those with a permission approval in 2007-2012.

Figure B.11: Effects of estate regenerations on sales and listings (using timing variation)


(a) Sales of new houses

(b) Sales of old houses

(c) Rental listings of new houses

(d) Rental listings of old houses
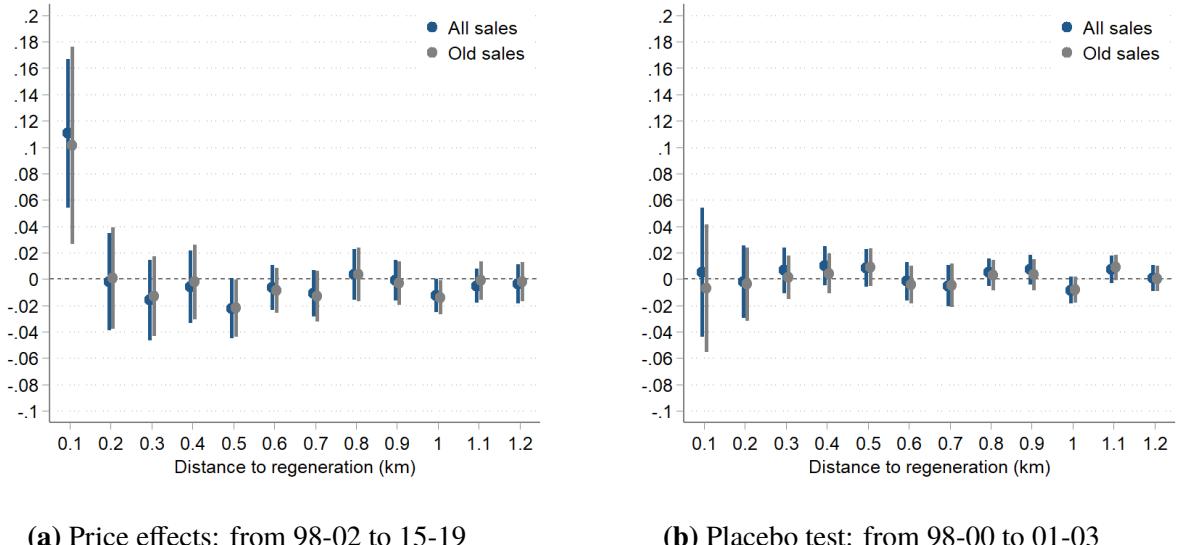
Note: The plots report coefficients $\beta_{\tau,r}$ in Eq. (3). For rental listings, we distinguish between "new" and "old" using text analysis on the description of the rental listing. Panels (a) and (b) use the balanced sample of estate regenerations with a permission approval in 2004-2012; panels (c) and (d) use those with a permission approval in 2007-2012.

Figure B.12: Effects on listings' descriptions 4-6 years after permission (using timing variation)

**(a)** Unit characteristics

(b) Building characteristics
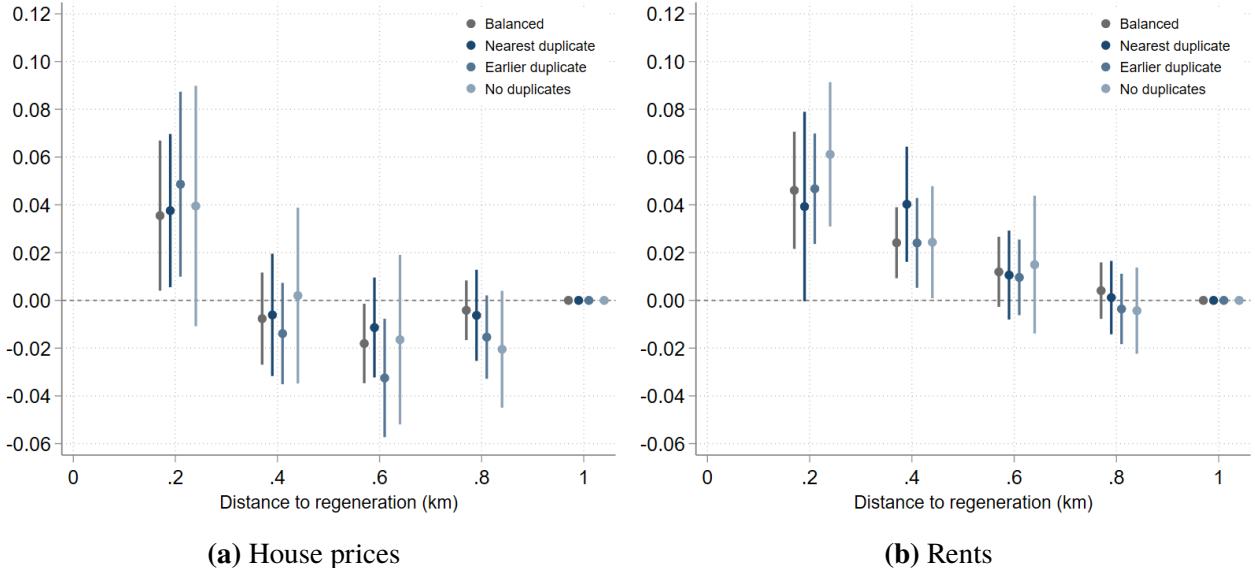
Note: Coefficients and related 95% confidence intervals are obtained by estimating a version of Eq. (3) that collapses event years into three periods (-3 to -1, 0 to 3 and 4 to 6) on the sample of rental listings using 200m rings. This plot shows coefficients for the 4-6 event year period. The plots use the balanced sample of estate regenerations with a permission approval in 2007-2012.

**Figure B.13:** Price effects accounting for treatment intensity and a placebo test

(a) Price effects: from 98-02 to 15-19

(b) Placebo test: from 98-00 to 01-03
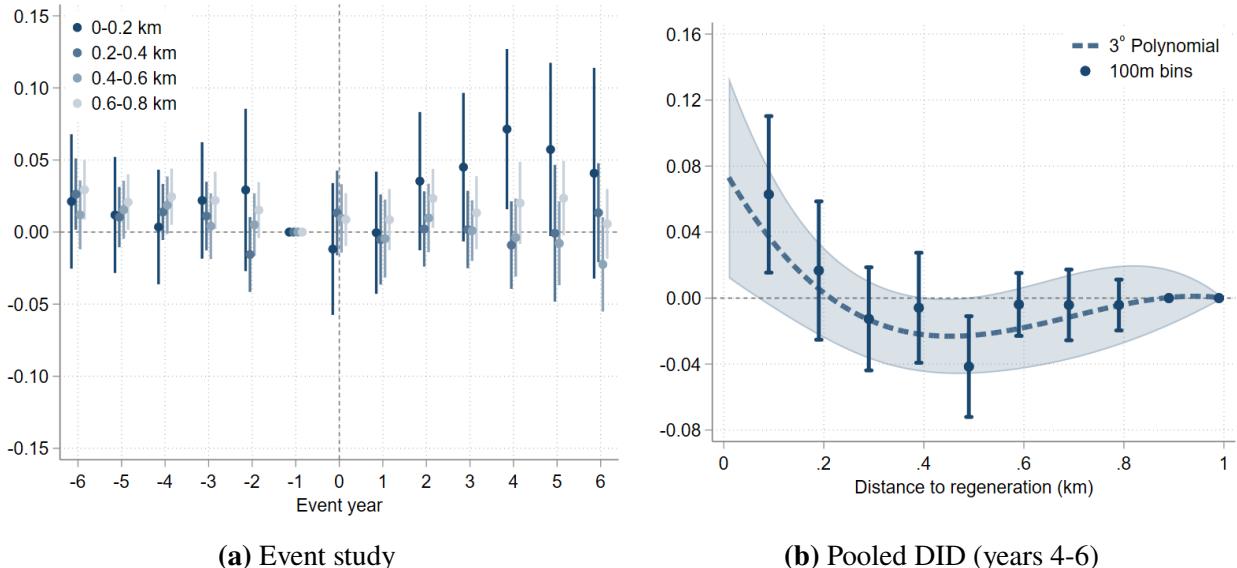
Note: The plots report coefficients β_r in Eq. (4). Blue estimates use all residential sales to create the house price index ρ_{it}, gray estimates only use sales of old houses. Standard errors are adjusted for spatial autocorrelation following Conley (1999).

Figure B.14: Price effects in years 4-6 by 200m rings for samples without duplicates
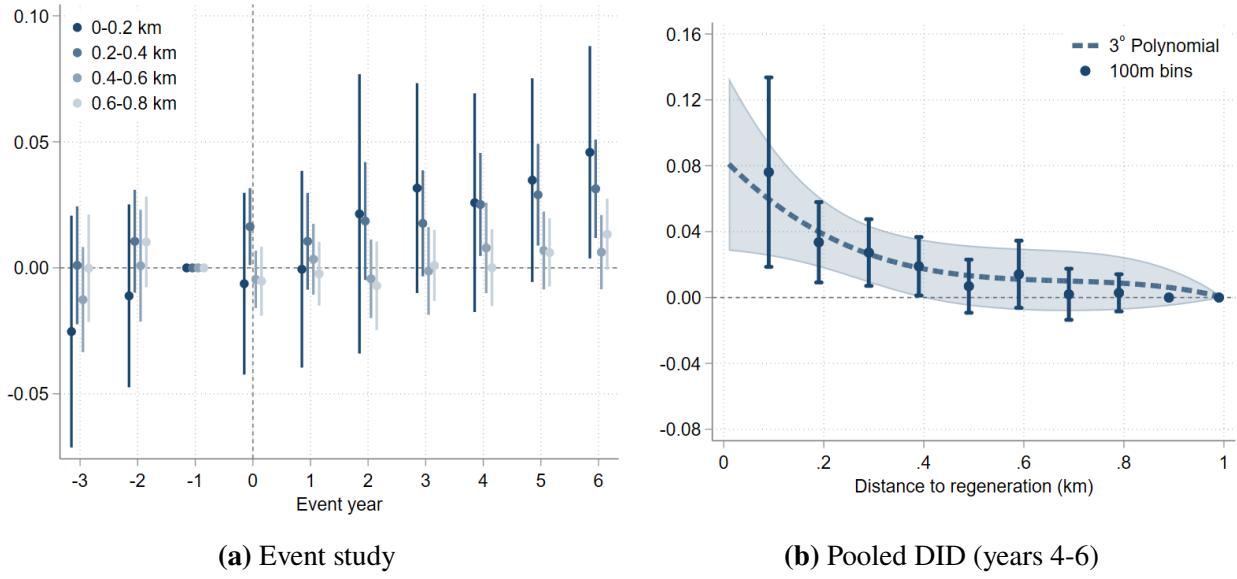

(a) House prices

(b) Rents

Note: The figure reports point estimates and 95% confidence intervals for coefficients $\theta_{1,r}$ in Eq. (2) using 200m rings. The "balanced sample" includes all housing units within 1km of an estate and corresponds to the main sample we use. "Nearest duplicate" and "Earliest duplicate" includes units that are duplicated across estates only for the estate the unit is closest to and for the estate that is regenerated earlier, respectively. "No duplicates" removes all units that are within 1km of more than one estate.

Figure B.15: Effects of estate regenerations on house prices for regenerations approved in 2007-2012

(a) Event study

(b) Pooled DID (years 4-6)
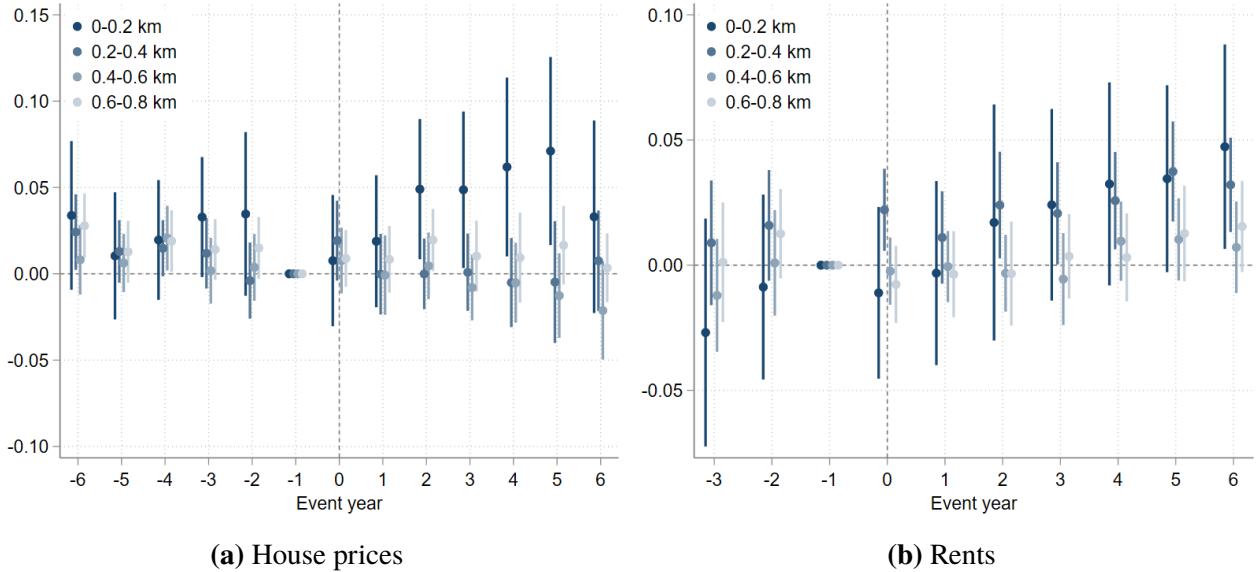
Note: Panel (a) and panel (b) reproduce Fig. II (panel (a)) and III (panel (b)), respectively, using the sample of estate regenerations with a permission approval in 2007-2012.

Figure B.16: Effects of estate regenerations on rents for a balanced sample (2009-2012)

(a) Event study

(b) Pooled DID (years 4-6)
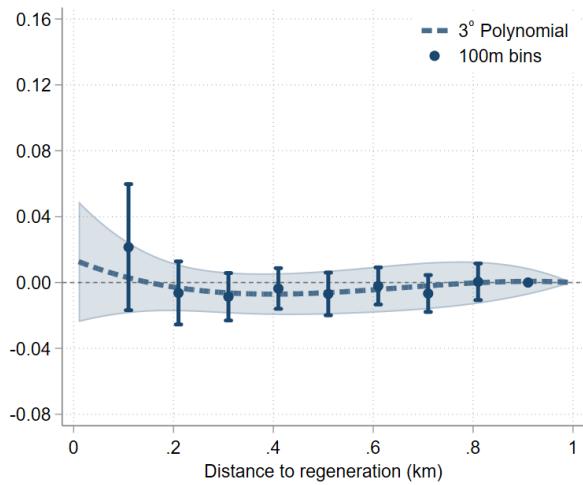
Note: Panel (a) and panel (b) reproduce Fig. II (panel (b)) and III (panel (d)), respectively, using the sample of estate regenerations with a permission approval in 2009-2012.

Figure B.17: Effects of estate regenerations on house prices and rents of old units

(a) House prices
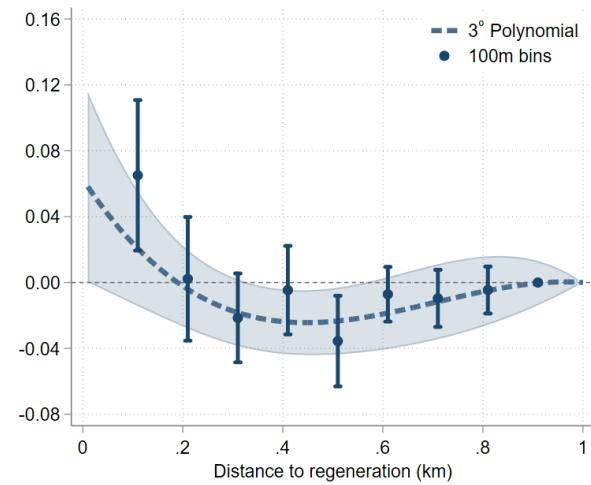
(b) Rents

Note: This figure reproduces Fig. II only using the sample of old units.
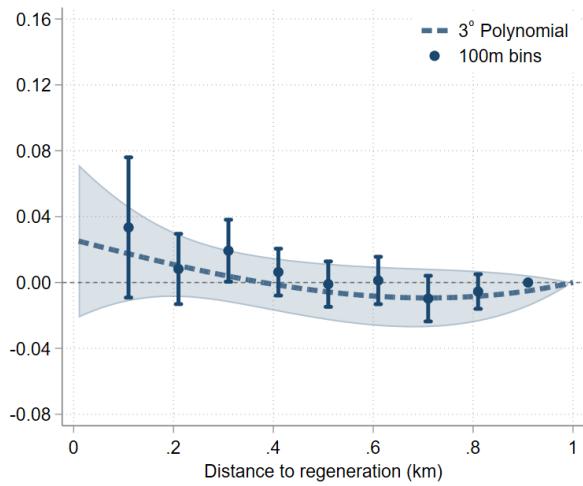
Figure B.18: Price effects for old houses with a continuous definition of distance for old units
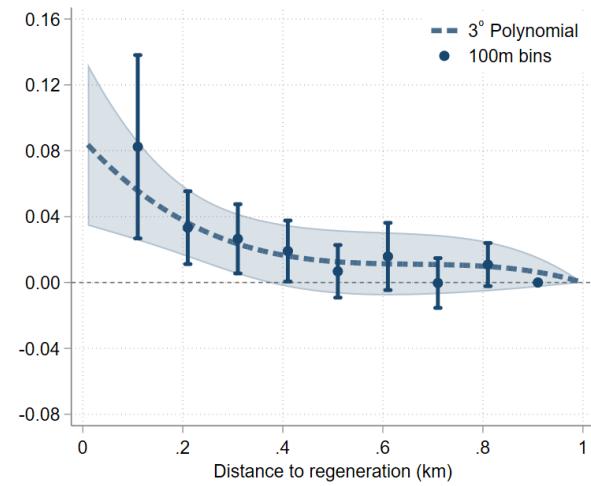
(a) House prices: 0-3 years

(b) House prices: 4-6 years
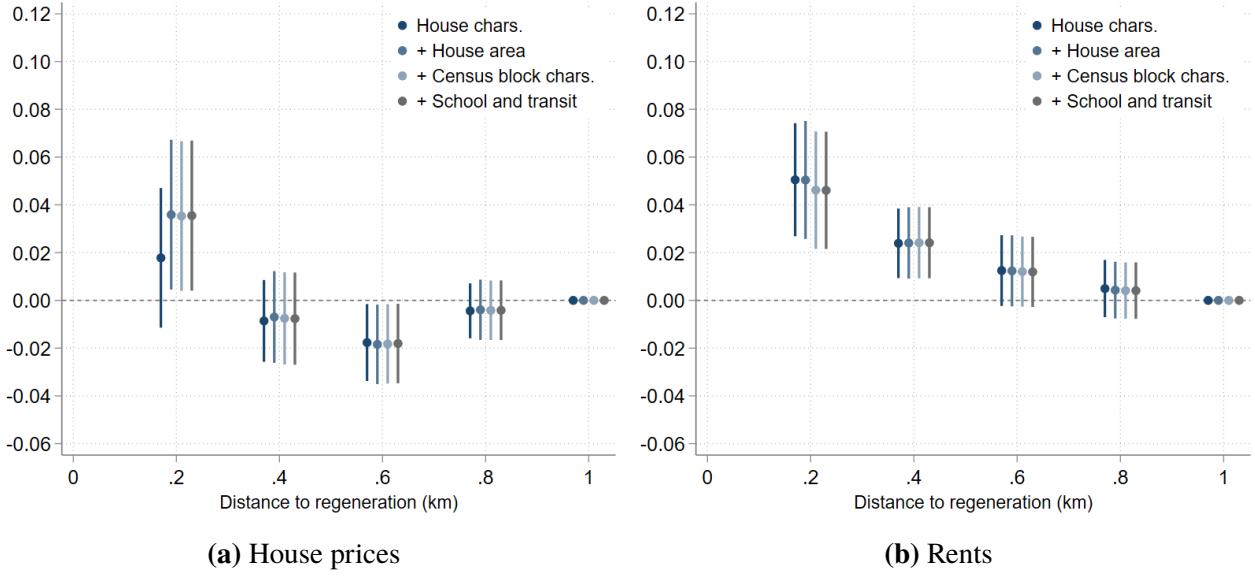
**(c)** Rents: 0-3 years

(d) Rents: 4-6 years
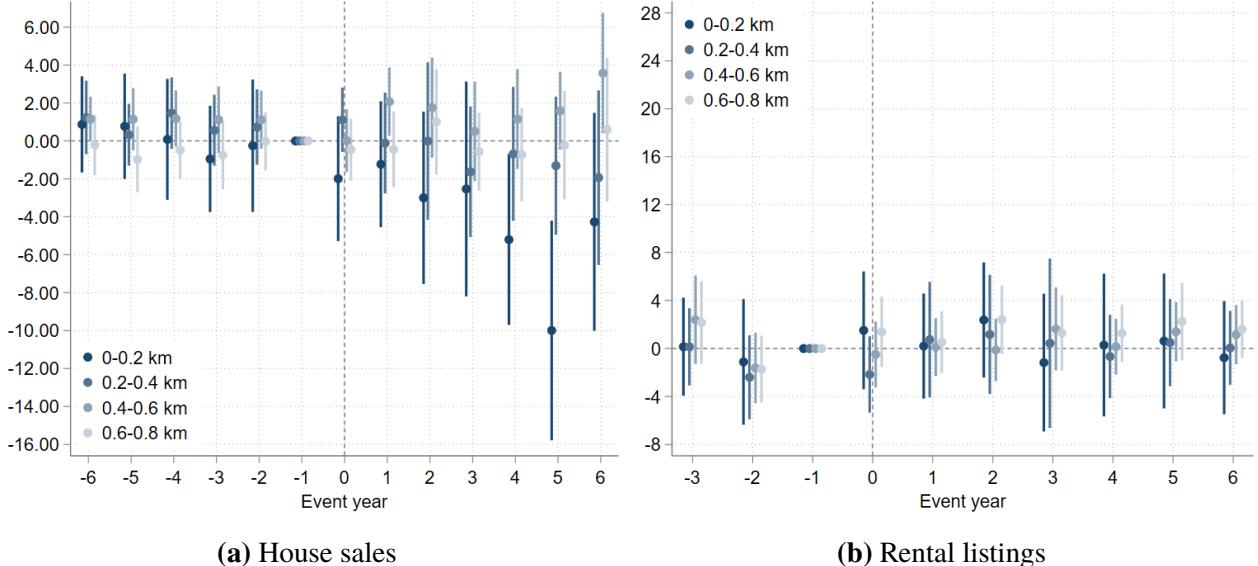
Note: This figure reproduces Fig. III only using the sample of old houses.

Figure B.19: Price effects in years 4-6 by 200m rings with several controls
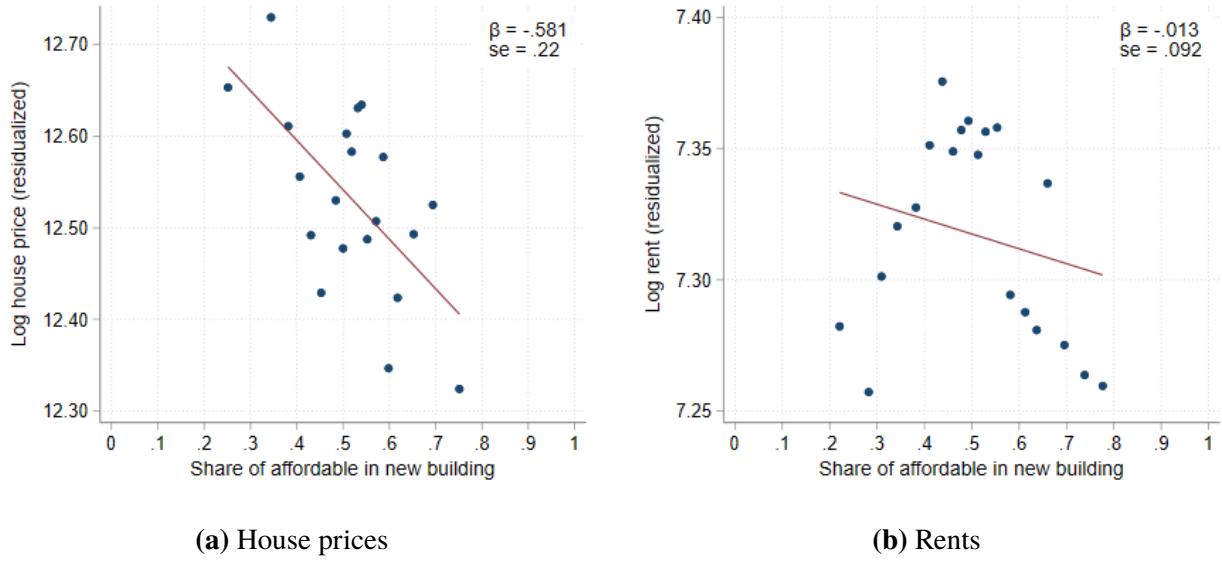


(a) House prices

(b) Rents

Note: The figure reports point estimates and 95% confidence intervals for coefficients $\theta_{1,r}$ in Eq. (2) using 200m rings. We include the control variables cumulatively, i.e. the gray estimates include all controls.

Figure B.20: Effects of estate regenerations on house area of house sales/listings, in sq ft

(a) House sales

(b) Rental listings
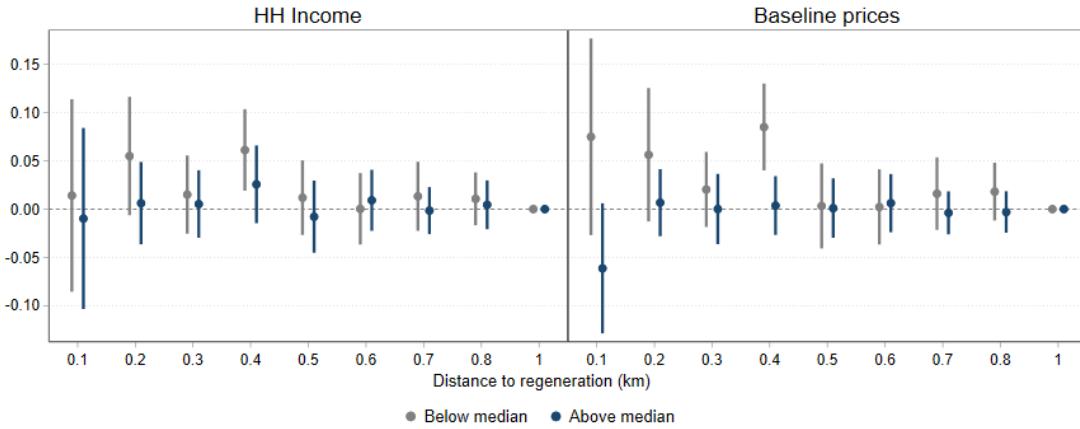
Note: The plots report coefficients $\beta_{\tau,r}$ and 95% confidence intervals of Eq. (1) using the average square footage of housing units in the period 2008-2018 of the postcode associated to each sale/listing. The plots use the residential sales and listings datasets –i.e. same dataset as Fig. II.

Figure B.21: Price elasticity to the share of public housing


(a) House prices
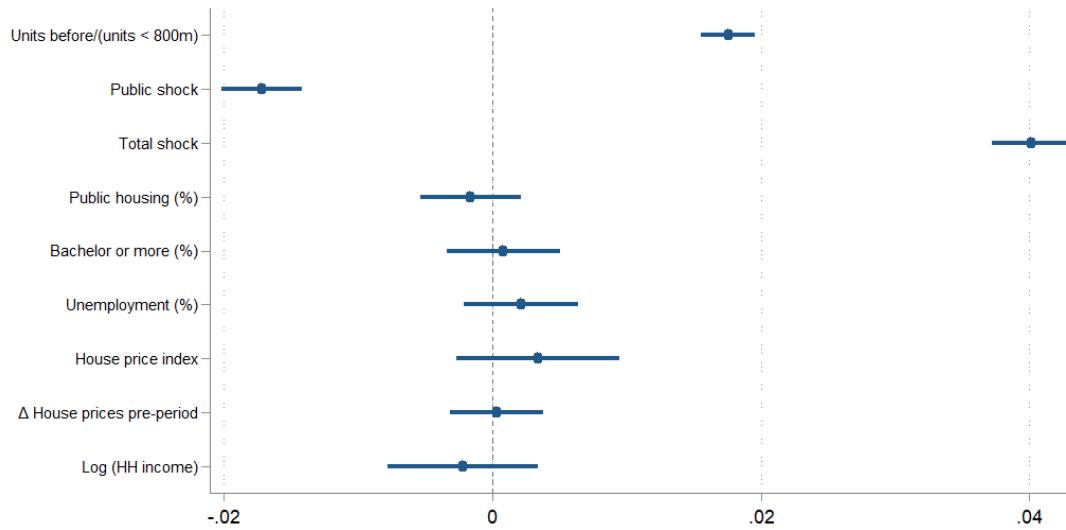
(b) Rents

Note: The plots are binned scatterplots of the logarithm of house prices/rents of market-rate units in regenerated blocks against the share of public housing units of the regeneration for sales/listings taking place after permission approval. We residualize both variables using the controls $\mathbf{X_{ht}}$ in Eq. (1), as well as year FE, a dummy for Inner London, the number of units in the estate before and after, and neighborhood household income and baseline house prices. The vertical line is the result of a linear regression, with the coefficient and standard error reported in the top right.

Figure B.22: Effect on refurbishments 4-6 years after regeneration by neighborhood type

Note: The plots reproduce the analysis of panel (b) of Fig. VIII using a dummy indicating whether the rental unit was recently refurbished as the dependent variable.

Figure B.23: Correlation of the market shock with building and neighborhood characteristics

Note: This figure presents the estimated coefficients and 95% confidence intervals of a multivariate regression of the "market shock" variable on several building (units before, affordable shock, total shock) and neighborhood (the remaining variables) characteristics. The sample contains regenerations in the balanced sample, i.e. with a permission between 2004 and 2012. All variables used as regressors are standardized.

C Tables

Table C.1: Back-of-the-envelope calculation: overall house price changes

	200m distance bins			100m distance bins		
	(1)	(2)	(3)	(4)	(5)	(6)
	Total (M)	Per unit	Pct. (%)	Total (M)	Per unit	Pct. (%)
All sales estimates	-356.5	-1,434.3	-0.7	-480.8	-1,920.0	-0.9
Old sales estimates	-448.9	-1,791.8	-0.8	-566.7	-2,250.5	-1.0

Notes: For the computation, the table uses average raw house prices at the census block level in the period 2000-2002, and the number of private housing units in 2001 times the average raw house prices as the housing stock value measure. Aggregate price changes are calculated in 2000-2002 millions of pounds, price changes per unit in pounds.

Table C.2: Effects of estate regenerations on crime (à la Gibbons (2004))

	Total crimes				**Criminal damage**			
	Mixed		Non-mixed		Mixed		Non-mixed	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full	Large	Full	Large	Full	Large	Full	Large
0-200m	-0.453*	-0.648	-0.127	-0.015	-0.107***	-0.139**	-0.007	0.007
	(0.260)	(0.398)	(0.176)	(0.287)	(0.035)	(0.057)	(0.032)	(0.046)
200-400m	-0.043	-0.006	0.109	-0.132	-0.023	-0.041	0.006	-0.027
	(0.226)	(0.326)	(0.162)	(0.225)	(0.030)	(0.048)	(0.033)	(0.047)
400-600m	-0.196	0.145	0.185	0.312	-0.023	-0.014	-0.010	-0.023
	(0.174)	(0.192)	(0.188)	(0.302)	(0.021)	(0.025)	(0.025)	(0.035)
600-800m	-0.258*	-0.116	0.210	0.299	-0.031	0.002	0.010	0.045
	(0.145)	(0.195)	(0.196)	(0.317)	(0.020)	(0.025)	(0.027)	(0.038)
N	18,076	9,337	7,930	4,363	18,076	9,337	7,930	4,363
R-squared	0.92	0.91	0.92	0.93	0.65	0.65	0.64	0.67

Note: This table estimates Eq. (2) using 200m rings and collapsing the entire post-treatment period into a unique "Post" dummy. Columns 1-4 report the results for the total number of crimes, Columns 5-8 do it only for criminal damage crimes. Within each dependent variable, we report results separately for mixed-income and non-mixed regenerations (mixed-income are the main sample throughout this paper). "Full" columns show estimates for the entire sample, "Large" columns do it for regenerations with a number of existing units above the median of the sample. Panel data goes from year 2008 to 2018 and includes regenerations with a permission approval between 2009 and 2018. Standard errors in parenthesis (clustered at the LA level). Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.3: Quality differences of new market-rate units on-site by market shock

	Unit chars.			Building chars.			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Luxury	Modern	Washing	Pool	Gym	Garden	Concierge
Market shock > p50	0.050	-0.043	-0.002	0.000	0.015	-0.003	0.079*
	(0.043)	(0.072)	(0.044)	(0.007)	(0.027)	(0.053)	(0.041)
House chars.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Census chars.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School chars.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Distance to tube	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Baseline nhood chars.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,972	2,972	2,972	2,972	2,972	2,972	2,972
R-squared	0.18	0.09	0.12	0.20	0.35	0.23	0.21
Y mean	0.17	0.51	0.14	0.01	0.06	0.33	0.10

Note: This table regresses dummy variables indicating the presence of the corresponding keyword in the listing description of market-rate units in regenerated blocks on the market shock dummy Z_e for listings taking place after completion. As control variables, we include the controls $\mathbf{X_{ht}}$ in Eq. (1), as well as year FE, a dummy for Inner London, the number of units in the estate before and after, and neighborhood household income and baseline house prices. Standard errors in parenthesis (clustered at the LA level). Significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C.4: Cost effectiveness calculations of public housing regenerations

Benefits	
House price increases	£3,647
Rent increases	£39,645
Children's future earnings	£21,729
Costs	
+ Demolition costs	£83,513
+ New construction costs	?
+ Relocation costs	£47,580
– Council tax savings	£41,511
– Stamp duty land tax savings	£4,816
Total costs (new construction costs in parenthesis)	
If LA pays subsidy per units	£147,525
	(£62,759)
If LA pays full new construction (lower bound)	£312,936
	(£228,170)
If LA pays full new construction (upper bound)	£430,765
	(£345,999)

Note: The quantities in this table are expressed in 2001 pounds per regenerated public housing unit. Appendix A.3 provides the details of this calculation.