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MORTGAGE BOYCOTTS AND HOUSING PRICE DYNAMICS: UNPACKING URBAN RIPPLE EFFECTS

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ABSTRACT

During the recent crisis, financial troubles among Chinese property developers led to widespread construction delays, resulting in homebuyer-organized mortgage boycotts. These boycotts exposed the unfinished building problem in the primary residential housing market and triggered broad repercussions in housing prices across neighbouring cities. This study examines the urban spillover effects caused by these mortgage boycotts. Our findings confirm the presence of urban spillover, where mortgage boycotts depress housing prices not only in affected cities but also in neighbouring ones. Using a stacked difference-in-differences design, we establish that these declines persist over time. Furthermore, we identify public attention as a key transmission and feedback channel, showing a rise in online search activity following boycott events—and vice versa. Additional analyses reveal a reverse ripple effect, where mortgage boycotts drive housing price increases in top-tier neighbouring cities, and a substitution effect, where affected cities experience positive price impacts in the secondary market.

Keywords: Unfinished Buildings, Homebuyer Mortgage Boycotts, Consumer Activism, Urban Spillover, Chinese Housing Market, Online Search

JEL Classifications: R11; R21; R31; R38

1 Introduction

In 2022, China's housing market witnessed a wave of homebuyer mortgage payment boycotts. These mortgage boycotts emerged in response to widespread delays and defaults in housing construction projects, many of which had been pre-sold to buyers—that is, homebuyers purchased units and began paying mortgages before construction was completed. Given that roughly 70–80% of new homes in China are sold through the pre-sale model (Tewari, 2022), frustration and anxiety grew among homebuyers when developers failed to show progress or deliver units, while mortgage payments continued. These events disrupted the expectations of hundreds of thousands of homebuyers, prompting many to withhold mortgage payments in protest.

The boycotts quickly spread across social media, intensifying in over 100 cities by mid-2022 (Reuters, 2022). By July 2022, homebuyers from hundreds of development projects had announced plans to cease mortgage payments, affecting up to 1.5 trillion RMB in mortgage loans linked to these unfinished projects (Zhou, 2022). The wave of boycotts gradually subsided in the fall of 2022 after the government introduced policy measures to address homebuyers' concerns, provide aid to financial institutions, and regulate developers.

In this paper, we examine these mortgage boycotts as a novel form of demand-side consumer activism shock to urban housing markets. Using newly compiled data on 350 boycott events across more than 100 cities in China, we investigate how these events impact housing prices both locally and in neighbouring cities and identify the mechanisms that drive these urban spillover. Our full sample comprises 10,906 city-month observations across all Chinese cities from January 2021 to September 2023.

We first document that housing prices decline not only in cities directly affected by the boycotts, but also in adjacent cities without local boycotts, revealing a spatial contagion effect. Controlling for time-varying local macroeconomic fundamentals and time and location fixed effects, our regression results show that mortgage boycott events are negatively associated with housing prices in neighbouring cities, indicating a geographical spillover effect from these shocks. Local homebuyer mortgage boycotts also exert a significant negative impact

on housing prices in the same cities, demonstrating an adverse price effect in cities where the boycott projects are located.

We ensure the robustness of these findings and assess the persistence of these spillover effects by utilizing a control subsample with no local boycotts in a stacked difference-in-differences (DID) framework. We treat the occurrences of neighbouring cities' boycott events as exogenous shocks and partition cities into treatment and control samples based on whether they experience these neighbouring boycotts. We find that treatment cities experience substantial price declines following the boycotts in neighbouring cities. Moreover, while the treatment and control cities show no significant price difference before the homebuyer mortgage boycotts, the occurrences of boycott events exert a strong negative impact on treatment cities' housing prices for up to six months.

We also explore the informational channel behind these spillover by using the Baidu online search index, tracking online search activities to measure public attention. We show that strike events significantly increase search activity related to housing project failures in neighbouring cities. In addition, results from the impulse response functions (IRF) in panel vector autoregression (VAR) estimation reveal a feedback loop between strike occurrences and public attention, consistent with an expectation-driven mechanism where consumer activism and sentiment propagate across urban markets.

Our results further show that the consumer boycott trigger reallocation effects in the housing market. Specifically, we document a flight-to-quality response, where top-tier cities (as measured by city GDP) experience price increases following boycott events in nearby lower-tier cities, indicating that homebuyers view development projects in major cities as safe havens and accordingly opt for these projects. Moreover, we find that homebuyer mortgage boycotts in the primary market increase housing prices in the secondary market, implying a substitution effect where homebuyers avoid the primary market and switch to the secondary market. As homebuyers become worried about the risks associated with unfinished buildings in the primary market, they shift preference toward the secondary market where they can purchase existing housing units outright. Nonetheless, we find that the secondary market effect is significantly stronger for local boycott events compared to boycotts in neighbouring cities.

We run a series of sensitivity analyses to ensure the robustness of our findings. First, we conduct a placebo analysis using only the period before the first boycott occurred in May 2022. Second, we conduct a subsample analysis including only those cities that did not experience any local homebuyer mortgage boycotts (i.e., no local event). Third, we include additional control variables that capture the availability of residential land and unit land price. Our results consistently support our main findings through these robustness tests.

Our study contributes to urban economics literature in several ways. First, we provide novel evidence on the economic consequences of consumer activism and boycotts in housing markets. While existing research on activism and boycotts tends to focus on consumer goods or services—typically in response to reputational or ethical concerns (e.g., Friedman, 1999; Koku et al., 1997; King, 2011)—little is known about how collective consumer action affects asset markets, particularly in the context of housing. To our knowledge, this is the first empirical study to identify and quantify the broader economic effects of a large-scale consumer boycott in the residential housing market. We show that such coordinated action not only depresses local and neighbouring housing prices but also disrupts public sentiment and reshapes housing market structure by shifting demand away from pre-sale units and toward the secondary market, and by triggering a flight to higher-tier cities viewed as safer investment destinations. These findings reveal how consumer discontent can propagate through urban markets, altering both pricing dynamics and the spatial allocation of demand across submarkets and city tiers.

Second, by showing that these boycott events generate negative price spillover, our study adds to the extensive body of research examining spatial linkages and contagion in housing markets (e.g., Brady, 2011; Chen & Chiang, 2020; Cohen et al., 2016; Gong et al., 2016; Holly et al., 2011; Li et al., 2019; Oikarinen, 2004; Tsai & Chiang, 2019; Yang et al., 2018). Specifically, our study is relevant to research focusing on project-level events affecting nearby housing units or neighbourhoods, such as distressed housing or foreclosure (e.g., Ganduri et al., 2023; Gerardi et al., 2015; Harding et al., 2009; Huang et al., 2020; Lin et al., 2009). However, prior studies predominantly document the spillover in proximity within the neighbourhoods. We differ by

focusing on a unique and widespread event—the unprecedented wave of mortgage boycotts in China—analysing how these very different project-level events create urban spillover effects that propagate to the vicinities of the neighbouring cities. Our findings are particularly intriguing as we uncover a novel channel of spillover that originates from online search activities of potentially worried homebuyers.

Third, we add to the burgeoning literature investigating the recent turmoil and challenges facing the Chinese housing market (e.g., Altman et al., 2022; Chen & Chiang, 2020; Cheung et al., 2021; Chu et al., 2021; 2023a; Glaeser et al., 2017; Li et al., 2022; Tsai & Chiang, 2020; Zhao et al., 2017; Zhi et al., 2019). To the best of our knowledge, we are among the first to focus on the recent unfinished building problem that plagues China's primary residential housing market. We further highlight the role played by social media and the public, via online search activities, in contributing to housing price spillover across adjacent housing markets. In doing so, our findings bear significant implications for policymakers. Our results indicate that the unique homebuyer strike events generate distinctive urban ripple effects across the Chinese residential housing market by raising public attention. These findings suggest that policymakers, in addition to devising appropriate policies to effectively respond to homebuyers' requests, must also have a proper plan of action to manage social expectations. This approach can help prevent the spread of these crises and avoid public scare cripple the housing market.

The remainder of the paper is organized as follows: Section 2 reviews related literature on consumer activism and boycotts, urban spillover, and the Chinese real estate market. Section 3 discusses relevant institutional details of the unfinished building crisis in China, particularly the leadup to the mortgage boycotts in mid-2022. Section 4 describes the sample and provides summary statistics, and Section 5 presents the research methodology. Section 6 presents empirical findings. Section 7 offers concluding remarks.

2 Literature Review

Several studies have documented the motivation and financial consequences of consumer activism and boycott threats. Klein et al. (2004) show that boycott effectiveness is shaped by consumers' perceived efficacy, anger toward the firm, and availability of alternatives (factors that also characterize China's mortgage strike movement studied here). John and Klein (2003) show that consumer boycotts are particularly impactful when they target well-known brands, as consumers perceive a greater sense of betrayal and are more willing to incur personal costs to punish the offending firm. Also, Sen et al. (2001) develop a behavioural model to explain why individuals join boycotts, emphasizing perceived efficacy, moral outrage, and identity alignment. These motivations—especially around trust and fairness violations—are particularly relevant in our pre-sale housing context, where homebuyers face large, long-term exposure to non-delivery risk. Regarding boycott consequences, Koku et al. (1997), using event study methodology, show that both announced boycotts and threats of boycotts lead to declines in the stock prices of targeted firms, with the impact magnitude varying by firm size and boycott publicity. Pruitt et al. (1988) find that the negative stock-price effect of union-led boycotts was short-lived, whereas King (2011) stresses the role of information and visibility in amplifying boycott effects, demonstrates that boycotts become more disruptive (including stock price decline) when they generate media attention and reputational risk. These findings align with our analysis of mortgage boycotts, in which spatial spillover are mediated through public attention captured by online search activity. Yet unlike prior research, which primarily focuses on consumer products and corporate reputation, our study examines how boycotts in the (capital-intensive) housing market can ripple through urban pricing dynamics and spatial demand flows.

Extant literature on spillover has examined nearby events that lead to either positive or negative urban effects in the residential housing market. For example, studies show that the establishment or relocation of a business, such as the opening of a new Walmart or the relocation of company headquarters, positively impacts housing prices in surrounding areas (e.g., Chen et al., 2024; Hu et al., 2024; Pope & Pope, 2015). Another line of research has focused on the effect of new transit construction on housing prices (e.g., Billings, 2011; Diao et al., 2017; Fesselmeyer & Liu, 2018; Zhou et al., 2021), consistently showing a positive impact. Ooi & Le (2013) further find that infill development (i.e., the development of under-used land in well-developed urban areas) increases local housing prices. A recent study by Kirchhain et al. (2021) shows a substitution effect, where negative company news of a dominant employer in a location increases home prices in the nearby location of a competitor. On the other hand, some studies document nearby events that lead to adverse pricing

effects on the housing market. For instance, exposure to environmental hazards negatively impacts nearby housing prices, such as pollutant emissions (e.g., Bauer et al., 2017; Kirchhain et al., 2020) and natural disasters (Pryce et al., 2011; Pommeranz & Steininger, 2020).

While events such as transit construction or natural disasters directly affect all nearby housing units, other studies show that project-level events impacting individual housing units also influence nearby housing prices. For example, several studies document that foreclosures have a negative externality effect on neighbourhood housing prices (Gerardi et al., 2015; Harding et al., 2009; Huang et al., 2020; Lin et al., 2009). Conversely, Ganduri et al. (2023) find that in distressed housing markets, institutional investments in pre-packaged bulk-sale properties lead to increases in transaction prices of nearby properties, reversing the discounts at which these properties were sold prior to the bulk-sale event. Our paper is closely related to these studies, as we also focus on individual project-level events that exert a contagion effect on the housing market. However, in our context, we examine Chinese unfinished building development projects that lead to unprecedented homebuyer mortgage boycotts, which have far-reaching impacts across neighbouring cities and the entire Chinese residential market.

In boarder terms, our study is related to the vast literature that examines the spatial and temporal dynamics in the residential housing market. Prior studies generally document lagged price changes in surrounding regions following price changes in the subject region (e.g., Brady, 2011; Chen & Chiang, 2020; Cohen et al., 2016; Gong et al., 2016; Holly et al., 2011; Li et al., 2019; Oikarinen, 2004; Tsai & Chiang, 2019; Yang et al., 2018). Specifically, Holly et al. (2011), Oikarinen (2004), and Tsai & Chiang (2019) show that shocks to a dominant region (London, Helsinki, and Beijing, respectively) propagate spatially to other regions with a delay. Gong et al. (2016) examine the diffusion time and show it takes months for housing prices to spread from nearby cities to cities further away. Cohen et al. (2016) find this spatial spillover effect to distant areas is greater following a financial crisis. Our study shows that housing market responses brought by these Chinese homebuyer mortgage boycotts are rapid, accompanied by instantaneous surges in online search activities related to unfinished building projects in neighbouring cities.

Lastly, our study is related to the burgeoning literature on the booms and subsequent turmoil facing the Chinese real estate industry. Two recent studies highlight the urban spillover effects among Chinese cities during the period of an overheated Chinese real estate market (Tsai & Chiang, 2019; Chen & Chiang, 2020). Earlier studies document real estate bubbles in China, attributing them to high leverage, high vacancy rates, and demand/supply disequilibrium that characterize the Chinese market (Glaeser et al., 2017; Zhao et al., 2017; Zhi et al., 2019). Since then, Cheung et al. (2021) focus on the COVID-19 period and show a significant drop in housing prices in China after the outbreak in Wuhan, with price gradients flattening from the epicentre to the urban peripherals. Chu et al. (2021) also show that COVID-19 leads to a substantial drop in real estate firm returns, but firms with broader geographic scope are better able to withstand the pandemic crisis. More recent studies have turned their focus to the debt crisis of the Chinese real estate market. For instance, Li et al. (2022) document that the large and increasing debt in China results in an extremely high loan-to-value ratio, highlighting the vulnerability of the Chinese real estate market. Altman et al. (2022) examine a series of Evergrande's credit events and find spillover of the Evergrande debt crisis to the rest of the market via peer real estate firms. Chu et al. (2023a) examine the imposition of the "three red lines" policy by the Chinese government to regulate real estate developers and find that the policy mitigates the debt crisis by effectively lowering stock price crash risk for high-leverage real estate firms.

3 Institutional Background

For new home sales in China, the pre-sale model is a common and dominant method, accounting for 70-80% of total sales (Tewari, 2022). Under this model, developers sell new homes to homebuyers before construction is complete. A unique feature of the Chinese pre-sale model is that homebuyers are required to commit to the full price of a pre-sale property and start paying their mortgage payments immediately, even before they receive their homes. However, Zhou (2022) reports that only an estimate of 60% of pre-sale homes were delivered promptly between 2013-2020, and up to $1.5 trillion RMB of mortgage loans were linked to delayed, unfinished building projects.

When real estate giant Evergrande announced it would fail its loan repayment obligations, it became one of the first firms to halt construction of its unfinished projects, starting with its project in south-eastern Jingdezhen city and then spreading to about one-third of its unfinished projects (Chen & Mao, 2023). Construction halts soon followed by other developers, with many debt-saddled developers leaving their development projects incomplete with no sign of progress. Frustrated homebuyers responded with organized boycotts, threatening to cease their mortgage payments. The first event in May 2022 subsequently led to a wave of boycotts across the country. Despite social media censorship limiting the news exposure of these boycotts (Reuters, 2022) and the possibility of homebuyers being penalized under the social credit system (Zhou, 2022), the boycotts nonetheless expanded rapidly, reaching over 300 boycotts in more than 100 cities by July 2022 (Reuters, 2022).

The wave of homebuyer boycotts gradually dissipated by the fall of 2022, due to the government's effective responses to homebuyers' requests. The China Banking Regulatory Commission first published a response in early July 2022 to reassure the public they were aware of the unfinished building problem from troubled property developers. It issued preliminary guidance for financial institutions to offer grace periods for homebuyers' mortgage payments and to manage their own risks from this crisis. Later that month, on July 28, the Political Bureau of the CPC Central Committee proposed a task force to ensure the prompt completion and delivery of finished building units. This was followed by the setup of a bailout fund by the central government (Reuters, 2022) and an extended mortgage payment holiday by financial regulators (Bloomberg, 2022). Furthermore, a series of provincial and municipal government policies were implemented to assist homebuyers of problematic unfinished building projects. Under the influence of the government's reaction, no strike events were reported after the last strike in Qingdao in September 2022.

4 Data

Information regarding homebuyer mortgage boycotts is collected from a publicly available database on GitHub, a repository documenting building development projects on mortgage boycotts from the first occurrence on May 29, 2022, until the last one on September 29, 2022. This repository details project locations, names, developers, and event dates. To ensure accuracy, we cross-reference our findings with a compilation of homebuyer mortgage boycott projects provided by IFENG.com (a renowned Chinese financial and business news media outlet). We obtain 350 events spreading across 105 Chinese cities.

The sample period starts at the beginning of the homebuyer mortgage boycotts and ends a year after the last event, covering 33 months from January 2021 to September 2023 (i.e., the end month of available data at the time of data collection). As described in the next section, for the analysis of the main empirical model, we utilize city-month observations over the sample period. For the stacked DID, we construct stacked databases with city-month observations of the treatment and control samples in each stack. Lastly, for the channel analysis, we utilize city-week observations of online search activities. We further consider city-day observations with daily data of online search activities in a VAR model.

We manually collect housing price data from Anjuke, a leading real estate information provider in China. The dataset includes housing price indices for both primary and secondary markets in each city (measured in yuan RMB per square meter). Since homebuyer mortgage boycotts specifically target new housing units, we focus on the primary residential market. To construct our variables of interest, we track the number of homebuyer mortgage boycotts occurring in both neighbouring and local cities on a monthly, weekly, and daily basis. We focus on the per period number of mortgage boycott events within the same city (LocalShock) and the number of events in neighbouring/nearby cities (NearbyShock) to assess the geographical spillover effects across proximate regions. For this analysis, neighbouring/nearby cities are defined as those sharing geographical borders. We collect additional city-level data from CEIC database, city statistical yearbooks, and Land China. In the analysis, we further control for GDP (measured in billion-yuan RMB) and per capita disposable income (measured in yuan RMB), both reported quarterly at the city-level by CEIC.

We also conduct an informational channel analysis to determine whether homebuyer mortgage boycotts influence urban spillover by increasing public attention. To quantify public attention, we construct a measure of online search activities for the terms "unfinished buildings" and "rotten-tail buildings" (in Chinese)—representative terms relevant to unfinished building projects—which serve as a proxy for public attention to homebuyer boycotts. Our data on online search activities come from the Baidu Search Index—one of China's

largest search engines and a widely used data source in academic research (e.g., Fang et al., 2020; Huang et al., 2017)—that tracks online searches on this platform. . The Baidu Search Index provides time-stamped and city-specific search data, including daily search index values for different terms.

Our full sample for the main analysis includes 10,906 city-month observations with housing price and homebuyer strike data covering 33 months from January 2021 to September 2023. We also employ a reduced sample of 5,919 observations given missing city-level data for GDP and per capita disposable income. Table 1A presents summary statistics of variables used in the main empirical analysis. As shown, primary and secondary housing markets exhibit average index prices of 8,345.53 and 8,372.99 respectively. NearbyShock and LocalShock, defined respectively as the numbers of homebuyer mortgage boycott events happening in neighbouring cities and in the subject city, are on average 0.18 and 0.03, but with a maximum of 58 and 47, indicating mortgage boycott events are skewed and concentrated in some cities. Figure 1 shows the distribution of homebuyer mortgage boycotts for cities with multiple events more than four. We find that Zhengzhou has the highest number of homebuyer mortgage boycotts, followed by Xi'an, Chongqing, Wuhan, and Changsha. Table 1A also reports descriptive statistics of the two macroeconomic controls: The average GDP of a city is 245.33 billion RMB, and per capita disposable income has an average of $23,514.51 RMB. Detailed definitions of these variables as well as variables used in subsequent analyses are included in Table 1B.

5 Methodology

5.1. Empirical Model of Homebuyer Mortgage Boycotts and Urban Spillovers

We examine the urban spillover effects of homebuyer mortgage boycotts with the following main specification:

$$〖\text{Ln(PrimaryPrice)}〗_{(i,t)}=\alpha_0+\alpha_1\ \text{NearbyShock}_{(i,t-1)}+\alpha_2\ \text{LocalShock}_{(i,t-1)}+\vec{\alpha}_3\ X_{(i,t-1)}+\vec{\alpha}_4\ Y_{(i,t)}+\vec{\alpha}_5\ \psi_i+\vec{\alpha}_6\ \gamma_t+\varepsilon_{(1,i,t)}, \quad (1)$$

where the dependent variable 〖PrimaryPrice〗_(i,t) is the monthly index of new housing prices in city i at month t and Ln(·) denotes the natural logarithm. The independent variables include LocalShock_(i,t-1), the number of homebuyer mortgage boycott events in the same city i for month t-1; NearbyShock_(i,t-1), the number of homebuyer mortgage boycott events that occurred in neighbouring cities during month t-1; X_(i,t-1), a vector of city-level control variables in month t-1 comprised of lagged housing prices (in natural logarithm form) in the primary market (given that housing prices tend to be autocorrelated – e.g., Brady, 2011; Pollakowski & Ray, 1997), lagged housing prices in the secondary market (in natural logarithm form), as the primary and secondary markets are highly correlated (e.g., Brzezicka et al., 2019); Y_(i,t), a vector of city-level variables comprised of GDP and per capita disposable income – both reported quarterly – to account for local economic conditions. We also include ψ_i, a vector of city fixed-effects to absorb time-invariant unobservable location characteristics of city i, γ_t, a vector of year-month fixed-effects to account for time-variant macroeconomic shocks that may confound housing prices and homebuyer mortgage boycotts. Finally, α_0–α_2 are estimated parameters, $\vec{\alpha}_3$–$\vec{\alpha}_6$ are vectors of estimated parameter, and ε_(1,i,t) is a random error term. Standard errors are two-way clustered by city and by year-month.

Importantly, in equation (1), we anticipate that local shocks should lead to more significant declines in housing prices for the primary residential market of the same city and hypothesize that an urban spillover effect causes housing prices of city i to decline when there are homebuyer mortgage boycotts in its neighbouring cities.

5.2. Stacked Difference-in-Differences (DID) Research Design

We further examine the urban spillover effects of neighbouring cities' homebuyer mortgage boycotts using a stacked difference-in-differences (DID) design. Since the neighbouring homebuyer mortgage boycotts occur outside of city i and they take place in different months, it is appropriate to treat them as exogenous shocks and adopt a staggered DID approach to establish causality. However, while a staggered DID approach reduces the confounding effects from contemporaneous trends, estimates from a standard two-way fixed effect DID regression with staggered time treatments could still lead to biased estimates. Therefore, we follow recent

studies (Baker et al., 2022; Cengiz et al., 2019) and adopt a stacked DID approach. We estimate the stacked DID with the following specification:

$$〖Ln(PrimaryPrice)〗_{(i,s,t)}=\beta_0+\beta_1\ 〖Treatment〗_{(i,s,t)}\times〖Post〗_{(i,s,t)}+\vec{\beta}_2\ X_{(i,s,t-1)}+\vec{\beta}_3\ Y_{(i,s,t)}+\vec{\beta}_4\ \psi_{(i,s)}+\vec{\beta}_5\ \gamma_{(s,t)}+\varepsilon_{(2,i,s,t)}, \quad (2)$$

where the dependent variable 〖Ln(PrimaryPrice)〗_(i,s,t) is the natural log monthly index of new housing prices in city i and stack s for month t. The independent variable of interest is the interaction of 〖Treatment〗_(i,s,t), a dummy variable that equals one if city i in stack s has encountered any neighbouring-city homebuyer mortgage boycotts at time t, and zero otherwise (i.e., if city i has never encountered any neighbouring-city boycotts); and 〖Post〗_(i,s,t), a dummy variable the equals one for periods post-occurrence of first homebuyer mortgage boycotts in neighbouring cities, and zero otherwise (i.e., periods pre-occurrence of homebuyer boycotts in neighbouring cities). All other independent variables are as described above; β_0–β_1 are estimated parameters; $\vec{\beta}_2$–$\vec{\beta}_5$ are vectors of estimated parameter; and $\varepsilon_{(2,i,s,t)}$ is a random error term . In estimating equation (2), we focus on a subsample that includes only locations without any local strike events, ensuring that the influence of neighbouring boycotts remains exogenous within the DID framework and is not affected by local strike interdependencies. Our primary interest is the coefficient on the variable 〖Treatment〗_(i,s,t)×〖Post〗_(i,s,t).

5.3 Vector Autoregression (VAR) Model

We utilize the panel vector autoregression (VAR) model to further investigate the feedback effects of public attention in facilitating homebuyer boycotts. Specifically, we conjecture that mortgage boycott events trigger increased online searches for unfinished building projects, which in turn may contribute to the emergence of additional homebuyer mortgage boycotts. In other words, online search activities and homebuyer mortgage boycotts are mutually dynamic and interdependent. We thus estimate the following panel VAR model:

$$Y_{(i,t)}=\sum_{(k=1)}^{n}\beta_k\ Y_{(i,t-k)}+\psi_i+\varepsilon_{(i,t)} \qquad \varepsilon_{(i,t)}\sim N(0,\Sigma_i) \quad (3)$$

where i, t, and k are city, day, and the lagged order indices, respectively. It's noted that we estimate VAR model over city-day panels as the online search activities can be measured by daily Baidu Search Index. $Y_{(i,t)}$ represents 1 × 3 vectors containing the following endogenous variables: the daily number of new mortgage boycotts at city i (denoted by LocalShock); the daily number of new mortgage boycotts at the neighbouring cities (denoted by NearbyShock); and daily online search activities at city i (denoted by Searching). City fixed effects (ψ_i) are introduced to account for potential heterogeneity across cities. $\varepsilon_{(i,t)}$ represents the 1 × 3 residual vectors. We choose the lag length (n) for the panel VAR based on the results of the Akaike statistical information criteria tests, following extant research (e.g., Hiebert & Sydow, 2011). Finally, for this analysis, we utilize daily data to construct the impulse response functions (IRF).

We derive key outputs from the panel VAR model in the form of impulse response functions (IRF). The IRF illustrates the temporal dynamics of each endogenous variable following shocks to the other variables in the VAR model. Specifically, we use the IRF to assess how online search activities respond to disruptions caused by local or nearby homebuyer boycotts. Conversely, we also examine whether surges in online searches activities can, in turn, trigger local and nearby boycotts. Our analysis focuses on the magnitude and persistence of these impulse responses to better understand the speed of urban spillovers through the public attention channel.

6 Results

6.1. Homebuyer Mortgage Boycotts and Urban Spillover

We estimate equation (1) using OLS with city and year-month fixed effects and standard errors clustered by both city and year-month. Results are reported in Table 2. Column (1) presents the results for the full sample, comprising 10,906 observations, and column (2) reports the results for the reduced sample of 5,919 observations that include city GDP and per capita disposable income as additional controls. As shown, we find strong negative urban spillover effects resulting from both local and neighbouring cities' homebuyer mortgage

boycotts, albeit the latter's effect is somewhat less pronounced than those of the former's. Specifically, it follows from column (2) that the coefficient of NearbyShock is -0.032, compared to -0.041 for LocalShock, indicating that any additional mortgage boycott events in local and neighbouring city are associated with an average primary market housing price decrease of roughly 3.2 and 4.1 bps, respectively (significant at the 1% and 5% levels respectively)—neighbouring mortgage boycotts exert an influence approximately 80% as strong as local boycotts. These findings underscore the substantial negative consequences of proximity to mortgage boycott events with significant spillover effects observed even in nearby cities. Regarding the control variables, housing prices show a highly significant positive association with lagged prices in both the primary and secondary markets.

6.2. Stacked Difference-in-Differences (DID)

For the stacked DID analysis, we utilize a subsample of cities that did not experience any local mortgage boycotts during the study period as a control group. There are 83 cities in the control group and 152 cities in the treatment group. In the treatment group, the average number of mortgage boycotts in neighbouring cities is 6.39, with the minimum number at 1 and maximum number at 50. We construct stacked databases, resulting in a total of 13,083 observations across the treatment and control samples, which reduces to 7,437 observations when macroeconomic controls are included. Table 3 presents the outcomes from the DID estimation of equation (2). Panel A of the table reveals that the key variable of interest, Treatment*Post, is equal to -0.665 and -1.154 (both significant at the 1% level) in columns (1) and (2), respectively. This implies that homebuyer mortgage boycotts in neighbouring cities led to a decline in housing prices for the treatment cities by 1.25% in the post-event period, compared to the control group.

To test for the parallel trend assumption over the pre-treatment periods and examine the urban spillover effects over time, we decompose the Post variable into a set of time fixed effect terms—PreX and PostX—where PreX represents a vector of dummy variables that equal one for observations in the treatment sample X months before neighbouring boycotts started (zero otherwise), whereas PostX denotes dummy variables that equal 1 for observations X months after the end of the neighbouring boycotts (zero otherwise). Panel B of Table 3 provides the results from the estimation of this specification of equation (2). In both columns, interaction terms of Treatment with PreX variables show an insignificant effect, indicating no housing price impact prior to the mortgage boycott events, aligning with the parallel trend assumption. Post-event, the analysis highlights strong negative effects from neighbouring mortgage boycotts, with significant coefficients for the interaction terms with the PostX variables in both columns extending up to six months after the events. These findings demonstrate that neighboring homebuyer mortgage boycotts produce persistent negative effects on housing prices in the primary market.

6.3. Vector Autoregression (VAR)

We explore the dynamic bi-directional effect between nearby and local shocks and the online search activities related to the term depicting "unfinished buildings" (i.e., the term "rotten-tail buildings" in Chinese). Figure 2 reports the key results of the VAR estimations (i.e., equation (4)) over 39,556 city-day observations, examining the impulse responses of online search activities to nearby and local boycotts, and vice versa. The figure maps the daily impulse response functions (IRF) derived from the panel VAR model, capturing the responses of online search activities to a one-unit shock in homebuyer mortgage boycotts, and the reciprocal effects. The results confirm that both local and nearby boycotts increase online search activities, reinforcing our earlier findings. Notably, the IRF results reveal that the effects of boycotts on online search activities gradually diminish, returning to zero approximately 30 days (i.e., a month) after the events.

Comparing local and nearby mortgage boycotts, we find that local boycotts have a much stronger impact, with a peak IRF coefficient of about 20, whereas the peak coefficient for nearby boycotts is around 6. Conversely, online search activities are also found to elevate the likelihood of homebuyer mortgage boycotts, as demonstrated by the IRF measuring boycott responses to changes in online search activities. Figure A1 in the Online Appendix presents the full IRF results, encompassing all interactions among local boycotts, nearby boycotts, and online search activities. The findings further validate the mutual dependence and dynamic interplay among these variables. Overall, the VAR model results suggest that homebuyer mortgage boycotts

fuel increased online search activities, which in turn heightens the probability of future boycotts—creating a recursive feedback loop driving urban spillover.

As a robustness check, we use the Baidu Search Index for another term "cease repaying mortgage" (i.e., "断供" in Chinese), which are also related to mortgage boycotts, as the alternative proxy for public attention. We re-estimate the Panel VAR and report the corresponding IRF in Figure A2, wherein a similar pattern can be found as in Figure 1.

6.4. Primary-City Effect

We complement the analysis of spillover by examining whether primary cities exhibit stronger effect than others. We conjecture that while neighbouring mortgage boycott events exert a downward pressure on housing prices in nearby cities, if the affected city is a primary, top-tier city, homebuyers may perceive it as safer alternative—thereby mitigating the negative impact. To proxy for city's (market's) centrality, we use its relative GDP level. Specifically, we re-estimate equation (1), augmenting the right-hand side variables with 〖GDP〗_(i,t) and NearbyShock_(i,t-1)×〖GDP〗_(i,t), where 〖GDP〗_(i,t) denotes the total level of quarterly GDP in city i at time t. Moreover, to specifically examine the role of top-tier cities, we alternatively augment equation (1) with 〖HighGDP〗_(i,t) and NearbyShock_(i,t-1)×〖HighGDP〗_(i,t), where 〖HighGDP〗_(i,t) is a dummy variable equal to one if city i is in the top 10% in term of GDP, and zero otherwise.

Table 4 presents the results from estimating this augmented specification of equation (1). As shown in column (1), while the negative urban spillover effect is maintained (as evident by the negative and significant coefficient on NearbyShock), the interaction term of NearbyShock and GDP is positive. This suggests that the negative spillover effect due to mortgage boycott events is mitigated by cities with higher GDP. In particular, the coefficient on NearbyShock_(i,t-1)×〖GDP〗_(i,t) is equal to 0.003 (significant at the 5% level), translating into an economic significance of one billion RMB increase in GDP decreasing the effect of NearbyShock by 7.7%. Furthermore, it follows from column (2) that not only that the coefficient on NearbyShock_(i,t-1)×〖HighGDP〗_(i,t) is positive (equal to 0.159; significant at the 1% level), but also that the sum of the coefficients on NearbyShock_(i,t-1) and NearbyShock_(i,t-1)×〖HighGDP〗_(i,t) becomes positive (i.e., -0.034+0.159=0.125) and significant at the 1% level. This indicates that for top-tier, high GDP cities, mortgage boycott events in nearby cities are associated with an overall housing price increase. The latter implies that homebuyer mortgage boycotts in neighbouring cities carry opposing effects on top-tier cities. On the one hand, boycott events continue to exert an adverse impact on housing prices because they constitute bad signals to homebuyers in the primary residential housing market. On the other hand, given a nearby boycott event, investors flock to purchase new housing units in better cities as they view building projects in these cities as safe havens. Studies such as Devos et al. (2013), Fuerst et al. (2015), and Matsuo (2024) show, in commercial real estate and REIT markets, investors tend to seek safe investment options amid risk events. Our study shows a similar flight-to-quality phenomenon in the residential market.

6.5. Secondary Market Effect

How do homebuyer mortgage boycotts—specific to construction-in-progress in the primary residential market—affect housing prices in the secondary market? On the one hand, news of mortgage boycott events may erode homebuyer confidence, leading them to delay purchases in both the primary and secondary markets. On the other hand, however, a substitution effect may emerge, where homebuyers shift their preference toward existing units in the secondary market, avoiding uncertainty in the primary market caused by these mortgage boycotts. To examine this question, we re-estimate the equation (1), replacing the dependent variable with 〖Ln(PrimaryPrice)〗_(i,t), the log of the housing price index of the secondary market of a city i at in month t.

Table 5 presents the outcomes from this modified model specification of equation (1). Column (1) indicates that both NearbyShock and LocalShock coefficients turn significantly positive (at the 1% and 5% levels, respectively), suggesting that homebuyers—deterred by mortgage boycott events in the primary market—drive up housing prices in the secondary market. In column (2), the effect of nearby mortgage boycotts, while maintaining the positive sign, is statistically insignificant; the positive effect of local mortgage

boycotts is highly robust. Specifically, results show that one LocalShock leads to 1.4‰ bps increase in secondary housing price one month after the shock.

6.6. Additional Robustness Analyses

A key concern of the main empirical analysis is that mortgage boycott events generally happen in cities and regions with more building projects, and these locations are more susceptible to housing bubbles and subsequent decreases in housing prices. To enhance our findings of the causal effect between mortgage boycott events and urban spillover, we conduct a robustness analysis analogous to a placebo test. We examine the impact of mortgage boycott events on housing prices in the sample period before the first event happened in May 2022. We re-estimate equation (1), respectively replacing the key independent variables NearbyShock and LocalShock with AfterNearbyShock and AfterLocalShock, which measure the total number of mortgage boycott events that happened after the placebo period, respectively in neighbouring cities and in the same city. If our findings above are driven by some inherent location characteristics that lead to these mortgage boycotts, we should expect to find a significant association between nearby and local shocks and housing prices in the placebo period. The Online Appendix presents the results from re-estimating equation (1) under this specification. As shown, the coefficients on the key independent variables become insignificant, reinforcing that housing prices are not affected by location characteristics that contribute to these mortgage boycott events during the non-event period—enhancing our conclusion that indeed mortgage boycotts were responsible for the decrease in housing prices.

Another key concern is the impact of local mortgage boycotts, as the housing price index in affected cities may include unfinished building projects involved in these boycotts. Additionally, mortgage boycotts in neighbouring cities are closely interrelated with local boycotts through online search activity, creating potential correlations. This intertwined dynamic suggests that local boycotts could be mechanically linked to housing prices and may also influence the interpretation of spillover effects from nearby boycotts. To address this issue, we exclude cities with local boycotts from our stacked DID analysis and explicitly account for the interdependence of local and nearby shocks in the VAR estimation. As an additional robustness check, we repeat our main analysis using a reduced sample that includes only cities without local boycotts. The Online Appendix reports the results, which continue to show a significant negative impact of nearby boycotts on housing prices.

While GDP and per capita income serve as key economic indicators, they do not fully account for other local economic conditions and location-specific characteristics. Since residential land sales and land prices play a crucial role in determining housing prices, we incorporate additional control variables—specifically, the total annual sales area of residential property and unit land price per annum—both measured for the current year. We utilize annual data on total new residential property sales area (ten thousand square meters) from city statistical yearbooks, as well as unit land price (RMB per square meter). To compute unit land price, we obtain land transaction data from Land China, an official information platform for land sales transactions in China. Since our study focuses on the residential market, we exclusively consider residential land transactions. Our findings reported in the Online Appendix remain qualitatively similar.

7 Conclusion

This paper examines homebuyer mortgage boycotts and their urban spillover effects in China's primary residential market. It investigates how consumer activism represented by these mortgage boycotts impacts housing prices not only locally but also in neighbouring cities. The stacked DID analysis confirms that homebuyer mortgage boycott events tied to unfinished building projects exert a persistent, negative effect on housing prices in nearby cities that have not experienced boycotts themselves.

We identify a key mechanism behind these urban spillover effects, showing that homebuyer mortgage boycotts amplify public attention in surrounding areas, as reflected in increased online search activities for both local and neighbouring boycotts. Our findings further demonstrate the interdependence between homebuyer mortgage boycotts and online search behaviours. Additionally, we uncover a reverse spillover effect in high-GDP cities and a substitution effect in the secondary market, where boycott events in neighbouring cities drive substantial increases in housing prices—consistent with a flight-to-quality phenomenon.

Our study provides valuable insights for academics and policymakers, highlighting how the unique dynamics of homebuyer mortgage boycotts in China generate urban spillover in the residential market. It contributes to the literature on spatial spillover in housing markets and the ongoing housing crisis in China. We establish a transmission and feedback channel through which the unfinished building crisis spreads to neighbouring cities.

For policymakers, this study underscores the negative externalities of unfinished buildings and homebuyer mortgage boycotts. It emphasizes the need for enhanced government supervision over the use of real estate pre-sale funding and the timely delivery of pre-sale properties. Additionally, policies promoting greater developer transparency can improve in-progress project disclosure and bolster homebuyer confidence.

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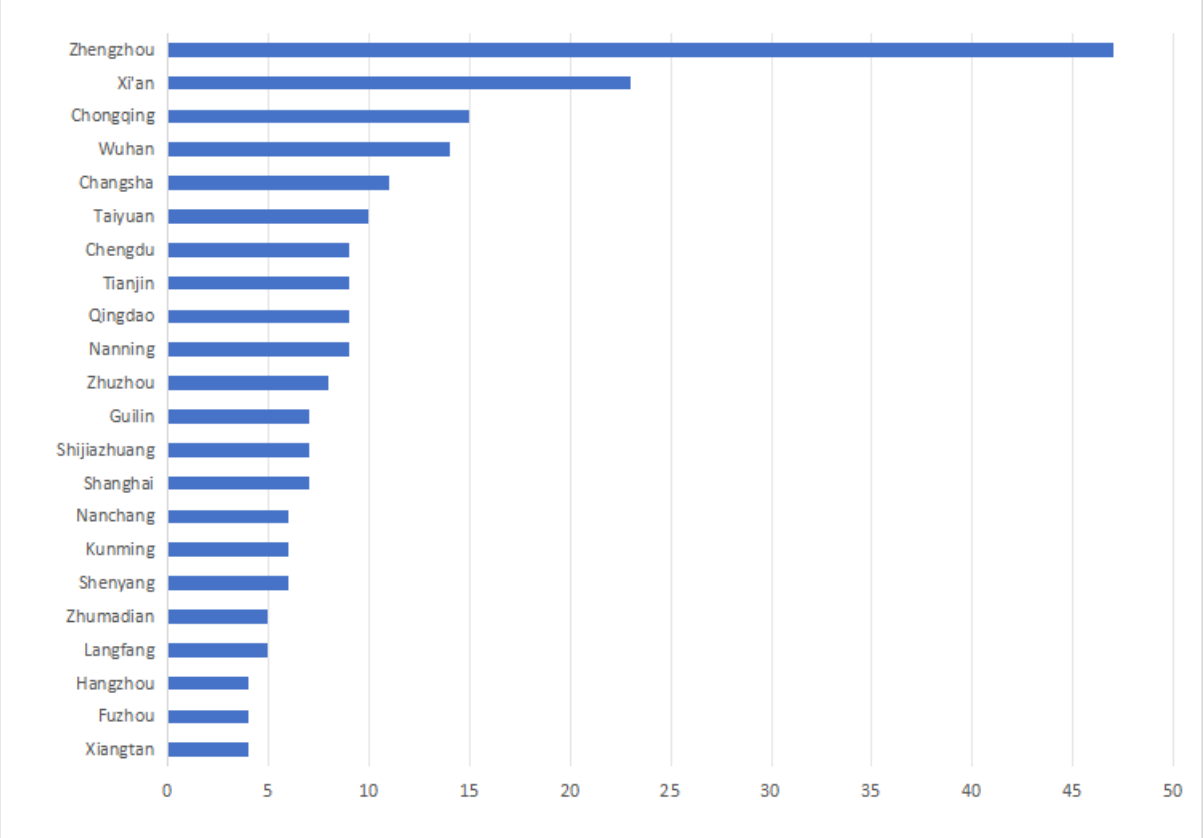
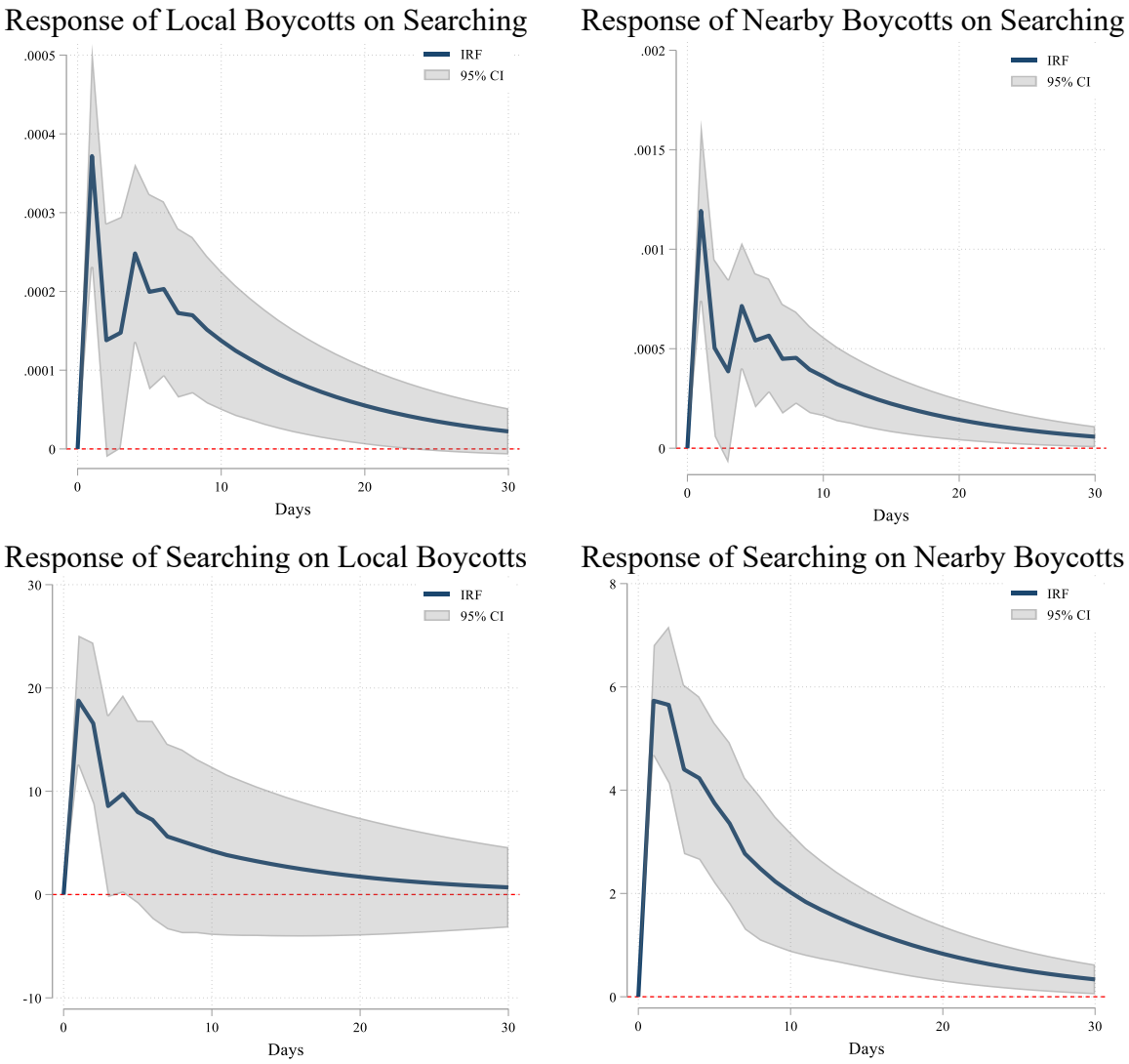
Figure 1: Distribution of Homebuyer Mortgage Boycotts by Cities



Notes: Figure 1 shows the distribution of homebuyer mortgage boycotts by cities. The cities with more than four events are depicted in detail in this figure.

Figure 2: Results of Impulse Response Function from Panel VAR Estimation



Notes: Figure 2 presents the key results of the impulse response function (IRF) from panel VAR estimation, wherein the endogenous variables are the number of local boycotts, the number of neighboring boycotts, and local online search activities for the Chinese term that is related to the unfinished building projects (i.e., *"rotten-tail buildings"* or "烂尾楼" in Chinese). The panel VAR is estimated on city-day observations, with the sample period spanning from May 29, 2022, to October 1, 2022. The shaded areas denote 95% confidence intervals of the impulse response function (IRF).

Table 1A: Summary Statistics of Key Variables

Variables	Obs.	Mean	SD	Min	Median	Max
$PrimaryPrice_{i,t}$	10,906	8,345.53	5,455.01	3,547.00	6,383.50	37,500.00
$SecondPrice_{i,t}$	10,906	8,372.99	4,979.49	3,222.00	6,664.50	33,163.00
$NearbyShock_{i,t}$	10,906	0.18	1.86	0.00	0.00	58.00
$LocalShock_{i,t}$	10,906	0.03	0.62	0.00	0.00	47.00
$GDP_{i,t}$	5,919	245.33	352.53	7.83	135.23	4,161.09
$Income_{i,t}$	5,919	23,514.51	12,785.51	3,995.00	22,222.00	77,415.00

Notes: Table 1 presents summary statistics for the full sample on variables used in the main regression analysis over the sample period of January 2021 to September 2023.

Table 1B: Variable Definitions

Variables	Definitions
PrimaryPrice	Monthly/weekly index of new housing prices in the primary market of a city, taken in natural logarithm form *Ln(PrimaryPrice)* in the regression analysis.
SecondPrice	Monthly/weekly index of housing prices in the secondary market of a city, taken in natural logarithm form *Ln(SecondPrice)* in the regression analysis.
NearbyShock	The number of homebuyer mortgage boycott events happening in neighboring/nearby cities in that month/week.
LocalShock	The number of homebuyer mortgage boycott events happening in the same city in that month/week.
GDP	City-level quarterly GDP (Unit: Billion RMB).
Income	City-level quarterly per capital disposable income at city-level. This variable is reported quarterly (Unit: RMB).
*Treatment*Post*	A dummy variable that indicates the post-occurrence of homebuyer mortgage boycotts in neighboring/nearby cities. It equals one if a city has encountered any neighboring homebuyer mortgage boycotts and thereafter, and it equals zero if a city has never encountered any neighboring mortgage boycotts.
Treatment	A dummy variable that indicates the occurrence of homebuyer mortgage boycotts in neighboring/nearby cities. It equals one if a city has encountered any neighboring homebuyer mortgage boycotts, and it equals zero if a city has never encountered any neighboring mortgage boycotts.
PreX	A dummy variable that equals one for observations in treatment group X month before any neighboring boycotts, zero otherwise.
PostX	A dummy variable that equals one for observations in treatment group X month after any neighboring boycotts, zero otherwise.
HighGDP	A city-level dummy variable that equals one if the city has top 10% per capita GDP. Otherwise, it equals zero.
AfterNearbyShock	The total number of nearby shocks happening in neighboring/nearby cities after May 2022.
AfterLocalShock	The total number of local shocks happening in the same city after May 2022.
AreaForSale	Total new residential property sales area in a city. This variable is reported annually. The unit is ten thousand square meters.
UnitLandPrice	Unit land price for residential property. This variable is measured annually. The unit is RMB per square meter.

Table 2: Homebuyer Mortgage Boycotts and Urban Spillovers

	(1) *Ln(PrimaryPrice)$_{i,t}$*	*(2)* *Ln(PrimaryPrice)$_{i,t}$*
NearbyShock$_{i,t-1}$	-0.031***	-0.032***
	(-9.816)	(-5.763)
LocalShock$_{i,t-1}$	-0.068***	-0.041**
	(-4.728)	(-2.556)
Ln(PrimaryPrice)$_{i,t-1}$	0.689***	0.551***
	(14.275)	(10.176)
Ln(SecondPrice)$_{i,t-1}$	0.110***	0.179***
	(3.761)	(4.901)
GDP$_{i,t}$		0.009
		(0.223)
Income$_{i,t}$		-0.001
		(-0.688)
Constant	178.546***	242.820***
	(4.108)	(5.501)
City FE	Yes	Yes
Year-Month FE	Yes	Yes
Adj. R^2	0.988	0.989
N	10,906	5,919

Notes: Table 2 presents the main regression results of the impact of neighboring homebuyer mortgage boycotts on housing price in the primary residential market in China over the period of January 2021 to September 2023. Column (1) reports the results with lagged price control variables and city and year-month fixed effects. Column (2) reports the results including city GDP and per capital disposable income as additional controls. The dependent variable is the monthly index of new housing prices in the primary market of a city in natural logarithm form, and the key independent variable is the number of homebuyer mortgage boycotts in neighboring/nearby cities lagged by one month. The price variables are rescaled (multiply by 100) and the control variables are rescaled (divided by 100). Robust standard errors are clustered at the city and year-month levels and t-values are reported in parentheses. ***, **, and * denote significance at the < 1%, 5% and 10% levels respectively.

Table 3: Stacked Difference-in-Differences (DID) Results

Panel A. Main Analysis

	(1) *Ln(PrimaryPrice)$_{i,s,t}$*	*(2)* *Ln(PrimaryPrice)$_{i,s,t}$*
*Treatment$_{i,s,t}$*Post$_{i,s,t}$*	-0.665***	-1.154***
	(-2.755)	(-2.755)
Ln(PrimaryPrice)$_{i,s,t-1}$	0.768***	0.744***
	(36.942)	(25.434)
Ln(SecondPrice)$_{i,s,t-1}$	0.076***	0.151***
	(3.296)	(3.299)
Constant	178.546***	94.940**
	(4.108)	(2.312)
City Controls	No	Yes
City-by-Stack FE	Yes	Yes
Year-Month-by-Stack FE	Yes	Yes
Adj. R^2	0.988	0.985
N	13,083	7,437

Notes: Panel A presents the regression results of the stacked difference-in-differences (DID) design for the subsample observations without experiencing any local mortgage boycotts. The neighboring mortgage boycott event serves as an exogenous shock, and we partition cities with and without experiencing any neighboring mortgage boycott respectively as the treatment and the control samples. Column (1) shows the regression results of the stacked DID design with lagged price control variables. Column (2) reports the results including city GDP and per capital disposable income as additional controls. All regressions include city*stack and year-month*stack fixed effects. The dependent variable is the monthly index of new housing prices in the primary market of a city in natural logarithm form, and the key independent variable, *Treatment*Post,* is a dummy variable indicating the post-occurrence of homebuyer boycotts in neighboring/nearby cities. It equals one if city *i* in stack *s* has encountered any neighboring homebuyer boycotts and thereafter, and it equals zero if city *i* has never encountered any neighboring boycotts. The price variables are rescaled (multiply by 100). Robust standard errors are clustered at the city level and t-values are reported in parentheses. ***, **, and * denote significance at the < 1%, 5% and 10% levels respectively.

Panel B. Dynamic Analysis

	(1) $Ln(PrimaryPrice)_{i,s,t}$	*(1)* $Ln(PrimaryPrice)_{i,s,t}$
$Treatment_{i,s,t}*Pre6_{i,s,t}$	0.867	1.706
	(0.830)	(0.898)
$Treatment_{i,s,t}*Pre5_{i,s,t}$	-0.211	0.843
	(-0.415)	(1.141)
$Treatment_{i,s,t}*Pre4_{i,s,t}$	-0.578	0.492
	(-0.914)	(0.761)
$Treatment_{i,s,t}*Pre3_{i,s,t}$	-1.897	-1.853
	(-1.557)	(-0.814)
$Treatment_{i,s,t}*Pre2_{i,s,t}$	-0.050	0.178
	(-0.095)	(0.226)
$Treatment_{i,s,t}*Pre1_{i,s,t}$	-1.403	-1.596
	(-1.532)	(-1.009)
$Treatment_{i,s,t}*Post0_{i,s,t}$	-1.211**	-1.033
	(-1.986)	(-1.294)
$Treatment_{i,s,t}*Post1_{i,s,t}$	-1.506***	-1.620**
	(-2.844)	(-1.981)
$Treatment_{i,s,t}*Post2_{i,s,t}$	-1.001**	-0.989
	(-2.039)	(-1.488)
$Treatment_{i,s,t}*Post3_{i,s,t}$	-1.142	-2.269*
	(-1.620)	(-1.867)
$Treatment_{i,s,t}*Post4_{i,s,t}$	0.478	-0.065
	(0.498)	(-0.047)
$Treatment_{i,s,t}*Post5_{i,s,t}$	-2.356***	-2.402*
	(-2.895)	(-1.969)
$Treatment_{i,s,t}*Post6_{i,s,t}$	-0.711**	-0.971
	(-2.072)	(-1.627)
$Ln(PrimaryPrice)_{i,t-1}$	0.768***	0.744***
	(37.108)	(25.513)
$Ln(SecondPrice)_{i,t-1}$	0.076***	0.150***
	(3.295)	(3.290)
Constant	137.918***	95.063**
	(5.559)	(2.336)
City Controls	No	Yes
City-by-Stack FE	Yes	Yes
Year-Month-by-Stack FE	Yes	Yes
Adj. R^2	0.988	0.985
N	13,083	7,437

Notes: Panel B presents the dynamic regression results of the stacked difference-in-differences (DID) design for the subsample observations without experiencing a local mortgage boycott. The neighboring mortgage boycott events serve as an exogenous shock, and we partition cities with and without experiencing any neighboring mortgage boycott respectively as the treatment and the control samples. Column (1) shows the regression results of the dynamic DID design with lagged price control variables. Column (2) reports the results including city GDP and per capital disposable income as additional controls. All regressions include city*stack and year-month*stack fixed effects. The dependent variable is the monthly index of new housing prices in the primary market of a city in natural logarithm form, and the key independent variables are interaction terms between the dummy variable, $Treatment_{i,s,t,}$ that indicates the treatment group which equals to one if city *i* in stack *s* has encountered any neighboring mortgage boycotts over the sample period (zero otherwise), and a set of time dummies. $Pre1_{i,s,t}$ denotes observations in the treatment group in stack *s* one month before any neighboring mortgage boycotts; while $Post1_{i,s,t}$ denotes observations one month after any neighboring boycotts, and so on and so forth. The price variables are rescaled (multiply by 100). Robust standard errors are clustered at the city level and t-values are reported in parentheses. ***, **, and * denote significance at the < 1%, 5% and 10% levels respectively.

Table 4: Top-Tier City Effect of Homebuyer Mortgage Boycotts and Urban Spillovers

	(1) *Ln(PrimaryPrice)$_{i,t}$*	*(2)* *Ln(PrimaryPrice)$_{i,t}$*
NearbyShock$_{i,t-1}$	*-0.039****	*-0.034****
	(-6.140)	*(-6.239)*
*NearbyShock$_{i,t-1}$*GDP$_{i,t}$*	*0.003***	
	(2.414)	
*NearbyShock$_{i,t-1}$*HighGDP$_{i,t}$*		*0.159****
		(3.726)
LocalShock$_{i,t-1}$	-0.046***	-0.069***
	(-3.086)	(-4.385)
Ln(PrimaryPrice)$_{i,t-1}$	*0.551****	*0.551****
	(10.173)	*(10.167)*
Ln(SecondPrice)$_{i,t-1}$	*0.179****	*0.179****
	(4.902)	*(4.910)*
GDP$_{i,t}$	*0.008*	*0.007*
	(0.198)	*(0.157)*
Income$_{i,t}$	*-0.001*	*-0.001*
	(-0.693)	*(-0.710)*
Constant	*242.820****	*242.797****
	(5.500)	*(5.500)*
City FE	*Yes*	*Yes*
Year-Month FE	*Yes*	*Yes*
Adj. R²	*0.989*	*0.989*
N	*5,919*	*5,919*

Notes: Table 4 presents the regression results of the impact of neighboring homebuyer mortgage boycotts on housing price in the primary residential market in China over the period of January 2021 to September 2023. Column (1) reports the results with additional interaction between *NearbyShock* and *GDP*. Column (2) reports the results with additional interaction between *NearbyShock* and *HighGDP*. The dependent variable is the monthly index of new housing prices in the primary market of a city in natural logarithm form, and the key independent variables are the number of homebuyer mortgage boycotts in neighboring/nearby cities lagged for one month and its interaction with *HighGDP*. The price variables are rescaled (multiply by 100) and the control variables are rescaled (divided by 100). Robust standard errors are clustered at the city and year-month levels and t-values are reported in parentheses. ***, **, and * denote significance at the < 1%, 5% and 10% levels respectively.

Table 5: Secondary Market Effect of Homebuyer Mortgage Boycotts and Urban Spillovers

	(1) *Ln(SecondPrice)$_{i,t}$*	*(2)* *Ln(SecondPrice)$_{i,t}$*
NearbyShock$_{i,t-1}$	0.009***	0.003
	(3.043)	(0.904)
LocalShock$_{i,t-1}$	0.007**	0.014***
	(2.126)	(5.087)
Ln(PrimaryPrice)$_{i,t-1}$	-0.000	-0.001
	(-0.083)	(-0.209)
Ln(SecondPrice)$_{i,t-1}$	0.945***	0.910***
	(43.392)	(61.059)
Constant	49.458**	81.840***
	(2.623)	(6.588)
City Controls	No	Yes
City FE	Yes	Yes
Year-Month FE	Yes	Yes
Adj. R²	0.999	0.999
N	10,906	5,919

Notes: Table 5 presents the regression results of the impact of neighboring homebuyer mortgage boycotts on housing price in the secondary residential market in China over the period of January 2021 to September 2023. Column (1) reports the results with lagged price control variables and city and year-month fixed effects. Column (2) reports the results including city GDP and per capital disposable income as additional controls. The dependent variable is the monthly index of housing prices in the secondary market of a city in natural logarithm form, and the key independent variable is the number of homebuyer mortgage boycotts in neighboring/nearby cities lagged for one month. The price variable variables are rescaled (multiply by 100). Robust standard errors are clustered at the city and year-month levels and t-values are reported in parentheses. ***, **, and * denote significance at the < 1%, 5% and 10% levels respectively.