The Impact of Rent Stabilization Policy:
An Empirical Study of Twin Cities

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Abstract

The study explores the impact of second-generation rent control, also known as rent stabilization, on the housing market in the Twin Cities by using the two-way fixed difference-in-difference (DiD) approach and event study strategy. Rent regulations are differentiated in Saint Paul and Minneapolis, where two cities are considered natural groups close enough to share similar demographic and geographic features, allowing exploration policy intervention on housing market indices over time. The study primarily focuses on the monthly home value affected by the rent stabilization at the neighborhood level. A triple difference-in-difference (DDD) model is employed for the robustness test. The results suggest that rent stabilization depresses the values of smaller homes more substantially, whereas larger homes face less direct policy-induced devaluation. The dynamic effect reveals that regulatory interventions can distort property market valuations, particularly for homes that are more susceptible to changes in investor expectations and future rental constraints. Moreover, the policy has less direct impact across building structures, including single-family homes and condominiums.

Keywords: Rent Stabilization; Housing Market; Home Value

JEL Classification: .

1 Introduction

Rent regulation, also known as rent control and rent stabilization, has been a continuous concern in urban economics, which affects social welfare, housing supply, and consumption behavior. Rent control, as one aspect of the regulation, was first imposed immediately after World War II in the U.S. to provide affordable accommodations to relocated laborers as the housing shortage during wartime. In the form of rent freeze [1], it was named as first-generation (or "hard") rent control. Due to the flourishing of the housing market in the 1950s, except for pre-1947 constructions in New York City, the housing market in other cities was decontrolled. During the 1970s, the second-generation (or "soft") rent control was imposed in many major metropolitan areas caused by concerns about civil rights, inflation, and the oil crisis (Arnott, 1995). The second-generation rent control is also named rent stabilization, which is a moderate form of rent freeze, regulating the amount of rent increase related to inflation.

Rent regulation in the United States varies significantly by state and city. In New York City, rent control differs from rent stabilization by restricting rents of constructions built pre-1947. Under the Maximum Base Rent system, the maximum base rent and collectible rent of each apartment is determined by the Division of Housing and Community Renewal (New York State Homes and Community Renewal, 2024). Rent stabilized apartments, according to the Rent Guidelines Board, can increase rents up to 2.75 percent for one-year leasing and 5.25 percent for two-year leasing since October 2024. To my knowledge, except for pre-1947 constructions in New York City, the modern rent control law in the U.S. refers to second-generation rent control, that is, rent stabilization. California [2] and Oregon [3] enacted statewide rent stabilization in 2019, capping annual rent increases at 5 percent and 7 percent plus inflation, respectively. District of Columbia, counties and cities in

[1] In literature, rent control is sometimes considered "rent freeze," referring to the government's policy to set ceiling rent at a certain level that limits the amount a landlord can increase.

[2] California passed a state law, the Costa-Hawkins Rental Housing Act, in 1995, exempting post-1995 constructions and single-family dwellings from rent control. Tenant Protection Act of 2019 introduced statewide rent caps on constructions older than 15 years. In November 2024, Proposition 33 is rejected, which aimed to repeal the Costa-Hawkins Rental Housing Act to expand local governments' authority to enact rent control.

[3] Similarly to California, dwelling units less than 15 years are exempted from the law.

Maryland, New Jersey, Maine, and Minnesota enacted local rent stabilization ordinances, limiting rent increases in the range of 2 percent to 6 percent plus inflation. Conversely, many states like Texas banned rent control due to concerns about the discouragement of housing development.

1.1 Related Literature

Rent control and rent stabilization are imposed to provide affordable units and protection to tenants who are entitled to the required services. The rent freeze policy sets rents at a specific level, often below the market equilibrium, which will cause three types of effects (Arnott, 1995). First, tenants who occupied controlled units benefit more than new residents who are more likely to find uncontrolled houses. Second, reduced rents discourage landlords from improving and maintaining rented units, lowering their property's value. Third, the housing shortage will result in problems of low mobility and inequality. Further concerns about rent control are misallocation, housing quality and market segregation (Buurma-Olsen et al., 2025; Chapelle et al., 2019; Chen et al., 2023; Early, 2000; Glaeser, 2002; Glaeser & Luttmer, 2003; Gyourko & Linneman, 1993; Mense et al., 2023; Moon & Stotsky, 1993; Olsen, 1972; Simmons-Mosley & Malpezzi, 2006; Wang, 2011; Zapatka & de Castro Galvao, 2023). The price ceiling in economics, by principle, will cause both consumer and producer surplus loss, leading to economic inefficiency.

Rent regulation leads to the dilemma of misallocation and inequality. Olsen (1972) classified goods into housing services and non-housing goods, investigating the purchasing behavior differentiation among households living in controlled and uncontrolled units in New York City. The results showed that families living in rent-controlled housing spent 4.4 percent less on housing services and 9.9 percent more on non-housing goods than those living in uncontrolled housing. Tenants of controlled housing benefited in aggregate approximately \$270 million in 1968, yet it costed landlords about \$521 million in total. Te author pointed out a possibility that although policy was imposed for aiding poor, landlords should not be regarded as richer than tenants by default. In addition, the results presented that lower-income families received more benefits than higher-income ones among families receiving a net benefit. However, Chen et al. (2023) examined the distribution of benefits of the policy from 2002 to 2017, finding that lower-income households did not benefit more than higher-income households. Besides the misallocation of benefits over income, they also revealed that minority groups benefited more than white tenants after 2011 compared to the early 2000s caused by gentrification but not from the policy targeting. Glaeser and Luttmer (2003) explained the misallocation of housing under rent control, claiming that it was caused by unexpected renters who got a rent-controlled apartment but did not value it most. Therefore, misallocation results in social welfare losses. In conclusion, previous studies indicated that rent regulations limit market freedom, are not progressive, and are inefficient in solving inequality (Chen et al., 2023; Early, 2000; Zapatka & de Castro Galvao, 2023).

Additionally, rent regulation can either increase or mitigate segregation. Segregation refers to a scenario in which individuals are separated geographically by demographics or social status (Kholodilin, 2024). In the 2000s, foreign-born and Hispanic-headed households benefited from the rent stabilization policy in New York City. Still, the amount saved by the policy had limited ability to help out the rent burden of tenants. At the same time, non-Hispanic Black households are more likely than other demographic groups to live in highly segregated neighborhoods (Zapatka & de Castro Galvao, 2023). Similar findings, according to Sims (2011), showed that in Cambridge, Massachusetts, rent stabilization positively affected minority residents but also caused an increase in residential segregation.

Declined tenants' mobility and housing quality are the other problems the policy will cause. Proved by Gyourko and Linneman (1993), in New York City, rent stabilization led to a negative long-term influence on housing quality. Since the 1970s, cities in Massachusetts enacted a "hard" rent control law, which was repealed in 1995. Sims (2007) utilized a quasi-experimental analysis to explore the impact of rent control on the housing market surrounding the Boston area. He provided evidence that lower rents resulted in reduced mobility and declined quality of rental units, which in turn led to inefficiencies. Ceiling rents can be increased when the rental units are upgraded and improved and decreased when they are deteriorated. Therefore, maintenance to landlords generates less revenue compared with spending on improvements to an apartment (Olsen, 1988). That is, landlords, to some extent, need to take the risk of losing revenue under the rent control policy. As mentioned by Moon and Stotsky (1993), the financial burden of low- and moderate-income households was shifted onto landlords. On the other hand, reduced income due to rent control from landlords leads to reduced property taxes, which involves local governments in fiscal problems.

1.2 Rent Regulation in Twin Cities

In November 2021, voters in both Saint Paul and Minneapolis took significant steps toward implementing rent stabilization, marking a historic move in the Midwest to address affordability concerns. The ordinance went effective in May 2022 in Saint Paul, restricting annual rent increases at 3 percent plus inflation. The implementation of the rent stabilization caused a 4.4% to 5.8% decline in real estate value, aggregated by a $1.1 billion loss in property value (Ahern & Giacoletti, 2022). Minneapolis, however, as of January 2025, the council had not yet enacted a specific policy. The Housing Rent Stabilization Work Group reported the potential impacts of the ordinance on the rental market (Goetz et al., 2021). Thirty people who had no direct economic interest in apartments, including landlords, developers, and industry experts, were interviewed, and five aspects of impact were summarized based on their responses. First, from the perspective of rent, although the rent cap had limited impact on rent (most owners commented that they already charged at below market level and raised slightly), the implementation of a rent stabilization policy would stimulate rents to return to market levels. Alternative fees would be potentially imposed by landlords to make up for loss from rents.

Furthermore, the second possible outcome was a decrease in housing quality and maintenance expenditures, as discussed and demonstrated in previous literature. Third, the rent stabilization would decelerate and shrink the production of new houses. Fourth, risk-averse developers might leave Minneapolis to seek other markets. Last but not least, the policy would cause the local market to become uncertain so that landlords of old buildings would exist in the market. At the same time, experienced non-local investors could take over local real estate, which would reduce local control and unsecured long-term commitments. Subsequently, property values would decline. In addition, the CPI-related rent cap was another concern from interviewees since expenses on maintaining real estate, such as labor, property tax, insurance, and utility, increased faster than the CPI; therefore, owners would face the dilemma of losing profits.

This study explores the impact of second-generation rent control, as known as rent stabilization, on the housing market in the Twin Cities by using the two-way fixed difference-in-difference (DiD) approach and event study strategy. Rent regulations are differentiated in Saint Paul and Minneapolis, where two cities are considered natural groups close enough to share similar demographic and geographic features, allowing exploration policy intervention on housing market indices over time. The study primarily focused on the monthly home value affected by the rent stabilization at the neighborhood level. A triple difference-in-difference (DDD) model is employed for the robustness test. Both Saint Paul and Minneapolis voted to approve the implementation of rent regulation at the end of 2021; therefore, the study explored home value changes after 2021, specifically between 2022 and 2023, when the policy went effective in Saint Paul but not in Minneapolis. In addition, it was announced in September 2022 that rent stabilization would be effective in January 2023 in Saint Paul; hence, the study focuses on the announcement date to explore responses from the housing market as well as various types of bedrooms. The results suggest that rent stabilization depresses the values of smaller homes more substantially, whereas larger homes face less direct policy-induced devaluation. The dynamic effect reveals that regulatory interventions can distort property market valuations, particularly for homes that are more susceptible to changes in investor expectations and future rental constraints. Moreover, the policy has limited direct impact across building structures, including single-family homes and condominiums.

As the two most populous cities in Minnesota, Minneapolis and Saint Paul serve as a critical case study for understanding the impacts of rent regulation. Implementing rent stabilization policies in these cities is likely to have long-lasting consequences, not only for the Twin Cities metropolitan area but also for future state-level housing ordinances. To my knowledge, this is the first study using Twin Cities as the control and treatment group to explore the impact of rent stabilization for filling the literature gap and provide empirical evidence of market inefficiencies caused by rent regulation. It also provides an evidence that rent regulation not only affect renting market but also influences the housing market distorting housing values. While previous research has extensively documented the shortcomings of rent control, this study further demonstrates consequences on home prices offering new insights into the broader economic implications of rent regulation.

2 Data and Identification

The primary data sets used in the study are collected from Zillow Housing Data Zillow Research (2024), recording the monthly housing market indices by region. Zillow Group Inc., founded in 2006, is one of the largest real estate technology companies in the U.S., providing housing services and information on buying, selling, renting, and financing. The home value index measures the smoothed value of homes in dollars ranging from the 35th to 65th percentile in Minneapolis and Saint Paul with seasonal adjustment. This database provides three advantages. First, it is measured not only by the transactions and prices paid by buyers but also by the information of homes distributed in a given area, providing more accurate information about the housing market than self-reported data. Second, it provides actual monthly market data at the neighborhood level, allowing the study to conduct experiments focusing on policy effects clustered by neighborhood. Third, it contains rich information on home values based on various types of houses, including single-family homes, condominiums, and one-bedroom to five-more-bedroom homes, allowing the study to examine the impact of rent stabilization policy more comprehensively. Single-family residence commonly refers to a single-detached home with no shared walls, utility, heating, and free-standing open space with privacy. In some circumstances, a townhouse sharing walls with another home is also considered a single-family home. A condominium (condo) is defined as owner-occupied apartments sharing common facilities. Cooperative (co-op) is similar to condos but without ownership, but shares of the company owned the property Zillow Learning Center (2024). This study combines condos and co-ops as one category for comparison with single-family residences. Moreover, the other classification of homes is distinguished by number of bedrooms. That is, the study combined one- and two-bedroom as one category and homes with more than three bedrooms as the other in the following experiments.

The study focused on the period when three months before and four months after the rent stabilization was announced, June 2022 to January 2023. As the announcement is considered to be a greater incentive to act than the implementation of the policy before it comes into effect, Adopting monthly data allows the study to explore the reaction of buyers and sellers in the housing market more accurately. The summary of statistics is presented in Table 1 describing the home value of various types of houses in both Saint Paul and Minneapolis. There are, in total, 19 neighborhoods in Saint Paul with approximately 310 thousand dollars in home value at the 35th to 65th percentile on average. The observations can be expressed as, for example, in Panel A, Saint Paul has 152 observations from 19 neighborhoods within eight months, from June 2022 to January 2023. Note that not every neighborhood contains every type of home; therefore, the number of observations varies over different home types. Minneapolis is divided into 83 neighborhoods with an average value of 335 thousand dollars of home value.

As shown in Figure 1, home values in Minneapolis are generally higher than those in Saint Paul, particularly for houses with five or more bedrooms. Additionally, the variation in home values is more pronounced in Minneapolis, especially for single-family residences and homes with more than three bedrooms. The average home value and variability increase with the number of bedrooms, which is sensible and reflects the fact that square footage correlates with value. Also, single-family residences have higher values and broader variation compared to condominiums. Anticipate that data dispersion will make the regression model inaccurate, so using the logarithm of the home value index is a feasible approach to reduce variation and obtain more precious results.

Figure 3 illustrates the average home values in each neighborhood. Housing prices in western Minneapolis are relatively higher than in other neighborhoods. Similarly, properties in western Saint Paul have higher values than eastern neighborhoods but have a lower variation than those in Minneapolis. In addition to detailed data on various home types, the study classifies houses into broader categories, as shown in Table 2—panel C.1 and D.1 distinguished homes by number of bedrooms. One-bedroom and two-bedroom are grouped as one category since those houses have

Table 1: Summary of Statistics (June 2022 - January 2023)

Home Types	Obs.	Mean	SD	Min	Max
Panel A: Saint Paul					*Panel A.1: Home Value Index ($1K)*
All Home Types	152	309.75	87.96	185.35	538.18
1-Bedroom	112	160.36	35.62	93.78	247.34
2-Bedroom	152	247.05	44.41	181.30	329.53
3-Bedroom	152	307.49	70.14	213.95	445.87
4-Bedroom	144	365.27	114.95	234.57	618.29
5-more-Bedroom	112	468.18	204.69	254.83	929.58
Single Family	152	330.57	108.47	212.96	650.77
Condominium	96	194.55	55.50	108.07	290.53
					Panel A.2: Log Home Value
All Home Types	152	12.61	0.27	12.13	13.20
1-Bedroom	112	11.96	0.23	11.45	12.42
2-Bedroom	152	12.40	0.18	12.11	12.71
3-Bedroom	152	12.61	0.22	12.27	13.01
4-Bedroom	144	12.76	0.30	12.37	13.34
5-more-Bedroom	112	12.97	0.42	12.45	13.74
Single Family	152	12.66	0.30	12.27	13.39
Condominium	96	12.14	0.29	11.59	12.58
Panel B: Minneapolis					*Panel B.1: Home Value Index ($1K)*
All Home Types	664	334.68	124.29	157.03	1,096.28
1-Bedroom	256	182.29	59.50	105.92	401.68
2-Bedroom	608	284.20	80.80	164.16	612.66
3-Bedroom	616	393.00	170.04	199.81	1,039.44
4-Bedroom	488	447.56	193.52	214.34	1,068.07
5-more-Bedroom	120	766.86	397.40	253.02	1,407.44
Single Family	664	389.90	176.65	183.94	1,134.58
Condominiums	232	216.56	56.68	132.62	360.94
					Panel B.2: Log Home Value
All Home Types	664	12.67	0.30	11.96	13.91
1-Bedroom	256	12.07	0.29	11.57	12.90
2-Bedroom	608	12.52	0.27	12.01	13.33
3-Bedroom	616	12.81	0.37	12.21	13.85
4-Bedroom	488	12.93	0.38	12.28	13.88
5-more-Bedroom	120	13.39	0.60	12.44	14.16
Single Family	664	12.80	0.37	12.12	13.94
Condominium	232	12.25	0.25	11.80	12.80

clustered values and are more affordable than others—besides, Panel C.2 and D.2 group homes by building structures as discussed previously.

Table 2: Home Value Index ($1K) by Types (June 2022 - January 2023)

Home Types	Obs.	Mean	SD	Min	Max
			Saint Paul		
Panel C.1					
Single-Doubled-Bd	264	210.27	59.25	93.78	329.53
Multi-Bd	408	371.99	148.36	213.95	929.58
Panel C.2					
Single-family	152	330.57	108.47	212.96	650.77
Condominiums	96	194.55	55.50	108.07	290.53
			Minneapolis		
Panel D.1					
Single-Doubled-Bd	864	254.00	88.35	105.92	612.66
Multi-Bd	1,224	451.41	237.29	199.81	1,407.44
Panel D.2					
Single-family	664	389.90	176.65	183.94	1,134.58
Condominium	232	216.56	56.68	132.62	360.94

Note: Panel C.1 and Panel D.1 show the broadly defined home types of smaller (single- and double-bedroom) houses and larger (more than three bedrooms) houses. Besides, houses are also classified by building structure, as presented in Panel C.2 and Panel D.2, which are single-family houses and condominiums.

3 Empirical Model

A quasi-experimental approach is utilized to investigate the impact of the rent stabilization policy in Saint Paul, which is set as the treatment group. At the same time, thanks to the geography prevailing of Minneapolis, adjoined Saint Paul, sharing resembled demographics that can perform as a control variable. No other control variables are employed in this study for two main reasons. First, this study tests the effect at the neighborhood-monthly level, while fewer data are recorded at this precise level. Second, many databases such as Federal Reserve Economic Data and Bureau of Labor Statistics often treat Minneapolis and Saint Paul as one region, which leads to, on the one

Table 3: Placebo Test Results

	First-Period Treatment		Second-Period Treatment	
	Home Value ($\times 10^{-4}$)	Log Home Value ($\times 10^{2}$)	Home Value ($\times 10^{-4}$)	Log Home Value ($\times 10^{2}$)
Treatment	1.159	3.353	4.881	3.630
	(5.805)	(4.354)	(6.110)	(3.380)
FE: Neighborhood	$\times$	$\times$	$\times$	$\times$
FE: Month	$\times$	$\times$	$\times$	$\times$

$*p < .05; **p < .01; ***p < .001.$

Note: The results of the placebo test are derived from Equation (1), showing the fake treatment effects by setting up event time one period and two periods before the actual treatment time. The purpose of conducting the test is to present fake events that have no significant effect on the outcome variable to support the parallel trend assumption. All regressions contain neighborhood and monthly fixed effect.

hand, makes it hard to find control variables separating those two cities; on the other hand, to some extent, it indicates that Minneapolis and Saint Paul can be regarded as relatively perfect treated and control groups that do not require further control variables to reduce heterogeneity.

To estimate the policy effect, a two-way fixed effects (TWFE) difference-in-difference (DiD) model is established at the first stage. It is assumed that treated and untreated groups are supposed to follow a similar trend over time without treatment. To support the assumption of parallel trends, the placebo test is adopted. Table 3 shows the estimated coefficients of the fake-treatment-period placebo test. The first half of the table reports the effect when presuming the treatment occurred one period before the actual time. The second half of the table shows the treatment effect when presuming the event happened two periods before the date. Both experiments are fixed at the neighborhood-monthly level. The results illustrate that neither home nor log home values are statistically significant in both experiments. That is, there is no significant difference in trends before the treatment supporting the validation of estimated DiD effects, which are not driven by pre-existing trends.

In addition to estimating the rent stabilization effects at the neighborhood-monthly dimension, the impacts on differentiated types of homes are examined. The implementation of the rent regulation is to release the rent burden and to help with rent affordability. Yet, the policy potentially decreases the supply of renting caused by the actions that landlords sold the property to owner-occupied (Diamond et al., 2019), which indicates that the rent regulation impacts the housing supply. The further concern is that it is not likely every house is significantly affected due to the different sizes, affordability, and values of properties. Due to the function of the ordinance, it is hypothesized that the supply of houses with one or two bedrooms and condos, which are valued less, could increase in the housing market, which leads to a surplus in the market; therefore, the home value of those particular types would decrease. Following difference-in-difference strategy, the estimation equation is expressed as

$$H_{ijt}^{k} = \beta_1 Treat_i^k \times Post_t + \gamma_{ij} + \delta_t + \epsilon_{ijt}^{k}, \tag{1}$$

where present the outcome variable, H_{ijt}^{k}, the value of home type k in neighborhood j of city i at time t, $Treat_i$, a dummy variable capturing treated group, $Time_t$, a dummy variable identifying time after event, γ_{ik} is geographic fixed effect at the neighborhood level, δ_t is year-month fixed effect, and ϵ_{ijt}^{k} is an error term, which ensures that comparisons are made within neighborhoods and over the same time periods, mitigating unobserved heterogeneity. The estimated coefficient of interest is β_1, which represents the average treatment effect. Additional examinations are performed to draw more insights from the data and provide a comprehensive analysis of policy implementation. The study also conducts the DiD linear regression on the home value in logarithm form, $\log\left(H_{ijt}^{k}\right)$, to ensure all circumstances are considered. In doing so, the estimated coefficients will present the change in the home value growth rate caused by the policy.

Additionally, an event study methodology is utilized to examine pre- and post-treatment over time to investigate the dynamic effect of rent stabilization on the housing market. As shown below, the event study model is

$$H_{ijt}^{k} = \sum_{\substack{\tau=-3 \\ \tau\neq 1}}^{4} \lambda_{\tau}^{k} \cdot D_{ij\tau}^{k} + \gamma_{ij} + \delta_t + \epsilon_{ijt}^{k}, \tag{2}$$

where $D_{ij\tau}^{k}$ stands for an indicator for event time, which span three month before and four month after the treatment occurs, $\tau \in \{-3, ..., 4\}$ and $\tau \neq 1$ as the first period after treatment is the omitted category serving as the benchmark comparison period. The coefficient of interest is λ_τ^k that represents the estimates of treatment over differentiated home type k in each event time τ. The coefficient after the event time (λ_τ^k for $\tau \geq 0$) captures dynamic effect of the rental stabilization, while when $\tau < 0$, the estimated coefficient λ_τ^k can also serve as placebo test (Miller, 2023), which are expected to fluctuated around zero. Panel fixed effects are indicated by γ_{ij} and δ_t and ϵ_{ijt}^k is an error term.

Furthermore, a triple-differences model (DDD) can be established by controlling home types to perform a robustness test generating more accurate results of home value change (Ahern & Giacoletti, 2022). The following equation is established,

$$\begin{aligned} H_{ijkt} = \alpha_1 Treat_i \times Post_t + \alpha_2 Type_k \times Post_t + \alpha_3 Treat_i \times Type_k \\ + \alpha_4 Treat_i \times Type_k \times Post_t \\ + \gamma_{ij} + \kappa_k + \delta_t + \epsilon_{ijkt}, \end{aligned} \tag{3}$$

where, $Type_k$ captured the types of homes as shown in Table 2. The types are classified into two categories; each group will be examined separately. The first group is sub-categorized based on the number of bedrooms into Single-Doubled-Bedroom Homes and Multi-Bedroom Homes. In contrast, the second group is divided into Single-family Homes and Condominiums in terms of the building structure. The estimated coefficient α_4 is the estimator of interest capturing the treatment effect of the treatment, which differs across home types in the treated area. Neighborhood and month fixed effects are included to control for time-invariant differences across neighborhoods and common time shocks.

4 Results

This section contains three parts of results derived from Equation (1) - (3). Table 4 presents the average treatment effect of Equation (1) using home values in a total of 102 neighborhoods within

8 months with neighborhood- and month-fixed effects. Column (1) shows the estimated coefficient of home value in dollars. It is estimated that the rental stabilization caused approximately an overall \$401 decrease in home value. Yet, it is not statistically significant, which could be because outliers distort the regression fitting, leading to inaccurate estimation, and also because of the policy's varied effects on different types of homes. The following examinations were conducted on each type of home, as shown in Table 5. Column (2) shows the estimated coefficient results using the logarithm format of the home value as an outcome variable. The result reveals that the policy led to a statistically significant 0.26% decrease in home values on average, relative to the control group, Minneapolis, after the implementation.

Table 4: Average Treatment Effect on Home Value

	(1) Home Value	(2) Log Home Value
Treatment	-400.6	-0.0026***
	(718.2)	(0.0009)
Observations	816	816
R-squared	1.000	1.000
FE: Neighborhood	×	×
FE: Month	×	×

$*p < .05; **p < .01; ***p < .001$.

Note: The results are derived from Equation (1) showing the aggregate level of treatment effects on the absolute and relative term of home value without identification of various types of houses. All regressions contain geographic-time fixed effect. Observations capture the monthly data of 102 neighborhoods from Saint Paul and Minneapolis.

Figure 4 and Figure 5 show the dynamic effect on home value and its growth rate. Both of them support the placebo test, showing that a similar pre-trend exists for both groups before the treatment. However, as discussed above, the post-treatment effect on home value presents a high separation at an aggregated level. On the other hand, the estimated long-term effect on log home value indicates that house price percentage changes in Saint Paul followed a stabilization pattern three months before the event. Following the announcement of rent stabilization, overall house prices in Saint

Paul fell significantly within four months, with the most significant declines occurring in the first two months.

Table 5 presents the estimated treatment results by home types using Equation (1) with fixed effect in both geography and time dimension. The impact of rent stabilization varies significantly across different home types. Homes with fewer than three bedrooms (smaller homes) experienced a negative effect, losing values due to the policy implementation. In comparison, homes with more than two bedrooms (larger homes) experienced a positive appreciation or limited adverse effects within the same period. Specifically, single-bedroom houses are impacted significantly, showing an average reduction of around $920 in home values, an approximately 0.78% decrease. Besides, the home value of two-bedroom houses experienced a non-significant reduction, suggesting minimal impact. Yet, the change rate of home value is significantly affected at 0.41% level. The negative effect on smaller houses indicates a possibility of declined demand or increased supply. Since the interaction of supply and demand determines the prices of homes, a further study on market demand and supply should be conducted to fully explain the shock-caused decreased house price.

In general, the policy implementation positively impacts home values for larger houses and has a limited negative impact on price percentage changes. A positive and significant coefficient for three-bedroom homes indicates a $3,021 increase in home values. However, the percentage change of price is insignificant. Four-bedroom homes experienced a significant negative price change of 0.25%, which reveals a consistent decrease for the homes over time. In addition, as the most expensive category, the value of homes with five or more bedrooms increases significantly at $5,253. In addition to the geographic fixed effect allowing comparisons within the same neighborhood, the regression is conducted separately among home types in this study to alleviate the heterogeneity. However, as shown in the results, home value appreciation with decreased price changes happened in larger houses, leading to a confusing scenario. A proper explanation could be that the right-skewed house prices of larger houses cause an overall increase in home values (Figure 6); that is, neighborhoods with extremely high house prices dominate the movement of overall home values. When log-transforming home prices, the impact of high-end homes is reduced. Still, since the

Table 5: Average Treatment Effect on Home Values over Home Types

Home Type	(1) Single-Bd	(2) Double-Bd	(3) Three-Bd	(4) Four-Bd	(5) Five-more-Bd	(i) Single Family	(ii) Condominium
Panel 1: Home Value							
Treatment	-919.0*	-24.64	3,021**	1,239	5,253*	1,367	1,329
	(474.5)	(669.2)	(1,321)	(967.7)	(2,920)	(894.6)	(887.5)
R-squared	0.999	0.999	0.999	1.000	1.000	1.000	0.999
Panel 2: Log Home Value							
Treatment	-0.0078***	-0.0041***	-0.0003	-0.0025**	-0.0034	-0.0009	0.0040
	(0.0027)	(0.0014)	(0.0014)	(0.0011)	(0.0036)	(0.0001)	(0.0034)
R-squared	0.999	1.000	1.000	1.000	1.000	1.000	0.999
Observations	368	760	768	632	232	816	328
FE: Neighborhood	×	×	×	×	×	×	×
FE: Month	×	×	×	×	×	×	×

$*p < .05; **p < .01; ***p < .001$.

Note: The regression is conducted separately over various home types and building structures, k, and the treatment effect is presented as *Treatment* in the table. All regressions contain geographic-time fixed effect. Columns (1) - (5) show the effect of rent stabilization encompassing all bedroom sizes. Columns (i) and (ii) show that different building structures' estimated treatment effects vary. Observations record the data of the monthly average home value index in each neighborhood. Noting that neighborhoods do not contain all home types, for example, no condominium exists in Como, Saint Paul.

price movement of high-end houses differs from that of affordable homes —lower-end dwellings are more likely affected by the rent regulation —the effects on percentage change are a statistically insignificant estimate. Even so, the estimated coefficients of log home value indicate that the rent regulation could negatively impact larger houses' prices to some extent if they are not extreme luxury houses offered to a small group of buyers.

Figure 7 exhibits the dynamic effects of the treatment over home types. The trends shown in the figure are aligned with the treatment results presented in Table 5. Prior to policy implementation, home value estimates remain relatively stable across all home types. However, after the policy was announced, the estimated results show that the impact of different housing sizes is divergent. Housing prices fell sharply in absolute and relative terms for one-bedroom and two-bedroom houses and showed a continuous downward trend. This suggests that, as mentioned above, rent stabilization may have either reduced demand or raised the supply for smaller homes in the for-sale market, potentially due to buyers' expectations of lower investment returns or reduced flexibility in converting such units to rentals in the future, confirming landlords' concerns (Goetz et al., 2021). Larger homes display weaker or even positive effects in absolute value terms, though their log-transformed home values still trend downward. The widening confidence intervals for larger homes suggest greater heterogeneity in their response to rent stabilization, supporting what was discussed above. Overall, the findings imply that rent stabilization depresses the values of smaller homes more substantially, whereas larger homes face less direct policy-induced devaluation. The dynamic effect reveals that regulatory interventions can distort property market valuations, particularly for homes that are more susceptible to changes in investor expectations and future rental constraints.

The second part of Table 5 shows estimated coefficients derived from Equation (1) by types of building structure. Due to the limited information about data, single-family houses are treated as a uniform category encompassing all bedroom sizes within a neighborhood, which could lead to a loss of heterogeneity in home values, leading to estimates of home values and relative terms being statistically insignificant, so the policy has limited effects on single-family houses. This issue is less pronounced for condominiums, which tend to have more standardized unit sizes and price structures, potentially explaining why the treatment effect for condominiums is clearer and more statistically significant over time (Figure 9), which is opposite to what is expected. One possible explanation is that rent stabilization often benefits existing tenants, but it can also lead to reduced rental availability for newcomers (Chen et al., 2023). Households that cannot find rental housing may choose to buy lower-priced condominiums, further increasing demand for them.

4.1 Robustness Tests

Difference-in-difference (DiD) models are estimated separately for different housing types to provide a more subtle analysis of treatment effects. This approach highlights how policy impacts may differ across housing categories, providing insight into differential impacts across housing types. However, it does not explicitly account for potential heterogeneity across home types within a unified model. To address this, a triple difference-in-difference model is utilized to reinforce the results of treatment effects from the rent stabilization policy by incorporating home type dummies.

Table 6 reports the treatment effect generated from Equation (3) over home types and building structures as shown in Table 2, where *Home Type* classifies number of bedrooms into smaller houses (i.e. single and double bedroom) and larger houses (i.e. more than three bedrooms) since from DiD results, those two categories potentially have different impacts from the policy. Besides, the model keeps using building structure differences to identity types of homes, that is, single-family houses and condominiums presented as *Building Structure* as the other panel. $Treat_i \times Post_t$ is the standard DiD estimate capturing the effect of rent stabilization in treated areas after policy implementation. $Type_k \times Post_t$ measures the term of home type or building structure interacting with post-treatment effects, where $Type_k$ is one when homes are larger or single-family. $Treat_i \times Type_k$ captures differences in treatment effects across home types or building structures, independent of the post-treatment period. $Treat_i \times Type_k \times Post_t$ is the rent stabilization treatment effects, which vary across home types and building structures in the post-treatment period. Every examination includes fixed effects at the neighborhood, monthly, and home type levels.

The first two columns present the effects on home types using more than three bedroom houses

Table 6: Triple Difference Treatment Effect of Rent Stabilization

	Home Type		Building Structure	
	Home Value	Log Home Value	Home Value	Log Home Value
$Treat_i \times Post_t$	1,854**	-0.0018	1,329	0.0040
	(920.0)	(0.0011)	(846.8)	(0.0033)
$Type_k \times Post_t$	8,036***	0.0117***	-6,774***	-0.0112***
	(718.9)	(0.00117)	(647.9)	(0.00205)
$Treat_i \times Type_k$	28,870	-0.0330	-87,773*	-0.1140
	(27,905)	(0.0632)	(45,242)	(0.1100)
$Treat_i \times Type_k \times Post_t$	-1,752*	-0.0026*	37.53	-0.0049
	(913.5)	(0.0015)	(823.8)	(0.0031)
Observations	2,760	2,760	1,144	1,144
R-squared	0.515	0.590	0.851	0.900
FE: Neighborhood	×	×	×	×
FE: Month	×	×	×	×
FE: Type	×	×	×	×

$*p < .05; **p < .01; ***p < .001.$

Note: The results are derived separately from Equation (3) over various home types and building structures, k, and the treatment effect is presented as $(Treat_i \times Type_k \times Post_t)$ in the table, where $Treat_i$ is a dummy variable equal to one for neighborhoods in Saint Paul, $Type_k$ is a dummy variable captures home types and building structures, and $Post_t$ is a dummy variable equal to one post-treatment. $Type_k$ equals to 1 when home type is *Single-Doubled-Bd* and building structure is *Condominium*. All regressions contain geographic-time-type fixed effect.

as the reference. The results suggest that home values of smaller houses in treated neighborhoods significantly increased by about $1,854 post-policy. However, the log-transformed home value has a relatively higher variation with an insignificant estimate. The differentiated effects on two terms can be explained as the extreme home values distort the average estimates making absolute changes appear significant while percentage-based effects remain unstable. Besides, the smaller houses' values continuously increase after the treatment, regardless of whether the area is treated, suggesting that these houses are more responsive to market shifts. Thus, it is sensible that houses with smaller sizes experience frequent price fluctuations. When controlling more strictly for home types and treatment status, the estimates show a negative impact of rent stabilization, with smaller homes experiencing a $1,752 decline in value. In addition, the 0.26% drop in log home values suggests that, compared to larger homes—which are less frequently rented and thus less affected by rent stabilization—smaller homes were more likely to be devalued post-policy.

The last two columns present the effects of rent stabilization on different building structures, using single-family houses as the reference category. The results show that in Saint Paul, home values increased by around $1329 post-treatment, indicating that the overall market reaction in treated areas was slightly positive. However, this effect was small and statistically insignificant in absolute and log terms, suggesting a limited direct impact of values across all building structure types. In addition, the results reveal that in neighborhoods of Saint Paul, condominium values declined by approximately $6,774 after the announcement of rent stabilization. The log-transformed home value estimate further confirms this negative effect, showing a 1.12% decline in condominium prices. However, this is not solid enough to prove that the value of condominiums declined due to the policy, but showing that their value experienced a significant drop after the event time compared to pre-event time. That is, the value of condominiums continuously decreases over time. Moreover, the estimated coefficient of interest also indicates that policy does not have a significant direct impact across building structures.

5 Conclusion

Second-generation rent control, commonly referred to as rent stabilization, is becoming a prevalent policy tool to alleviate tenants' rent burdens. However, it remains highly controversial due to concerns over its inefficiency, inequality, and unintended market distortions. This study uses the most recent case of Saint Paul to assess the impact of rent stabilization on the housing market, finding the effects on house values and proving that the policy can also harm the transaction housing market. Given similar demographics and geographic features, Minneapolis serves as a control group closer to Saint Paul, allowing a quasi-experimental setting. By focusing on monthly neighborhood-level home values, this study minimizes concerns related to variation in neighborhood assessments and provides a more precise measure of policy effects.

The first stage of the analysis employs a difference-in-differences (DiD) framework to estimate changes in mid-tier home values resulting from the implementation of rent stabilization. The findings suggest that mid-tier home values declined by 0.26% within four months of the policy's implementation. Building on these results, the study further examines how rent stabilization affects different home types and building structures. The analysis reveals that smaller homes (one or two bedrooms) experienced a notable decline in value, whereas larger homes (three or more bedrooms) were less affected. This suggests that landlords of smaller properties face financial losses not only in the rental market due to price caps but also in the transaction market, as property devaluation harms their resale value. These findings highlight the unintended consequences of rent stabilization, extending beyond rental affordability concerns to distortions in the housing market. Moreover, the assumption that landlords are inherently wealthier than tenants is not valid (Olsen, 1972). Those who own smaller properties and rely on rental income will face financial constraints and be stuck in a dilemma. In contrast, owners of larger properties are less likely to be affected because these homes are typically less reliant on rental income and are more resistant to policy-induced depreciation. Hence, this may ultimately lead to a more significant poverty gap and market segregation.

In addition, by fixing the housing type (the number of bedrooms), a triple difference model is used for a robustness check, confirming that the rent stabilization announcement has a negative impact on housing values. However, similar to the DiD estimates, the DDD results show insignificant effects across different building structures, suggesting that condominiums are not necessarily devalued more than single-family homes. Technically, rent stabilization, to some extent, will force landlords to leave the rental market (Goetz et al., 2021) and sell houses, leading to a decreased transaction value of condominiums. However, one limitation of this study is that the lack of detailed data on the number of bedrooms within each building structure prevents a more precise analysis. The results will be more accurate if more comprehensive data on the number of bedrooms for each building structure type can be accessed.

In conclusion, the impact of rent stabilization on home values is closely tied to property size, with smaller homes experiencing greater devaluation. Although rent stabilization aims to protect tenants, its adverse effects, such as reduced property values and financial burdens on small property owners, must be carefully managed. A more balanced and sustainable policy that considers the differences across home types and building structures can help mitigate these adverse effects while addressing housing affordability challenges. A policy should consider targeted rent regulations that distinguish between property sizes and structures, ensuring that small property owners are not financially burdened. To ensure long-term efficiency in the housing market, the policy should set up a rent cap in terms of property size and function, giving more flexibility to landlords.

6 Appendix

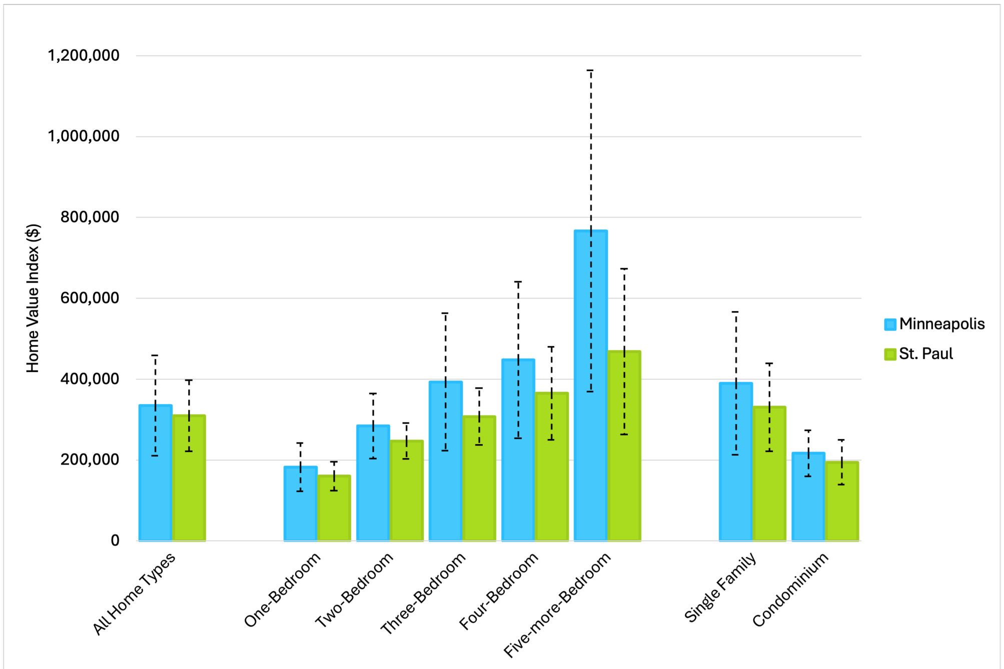

Figure 1: Home Value Index by City and Home Type

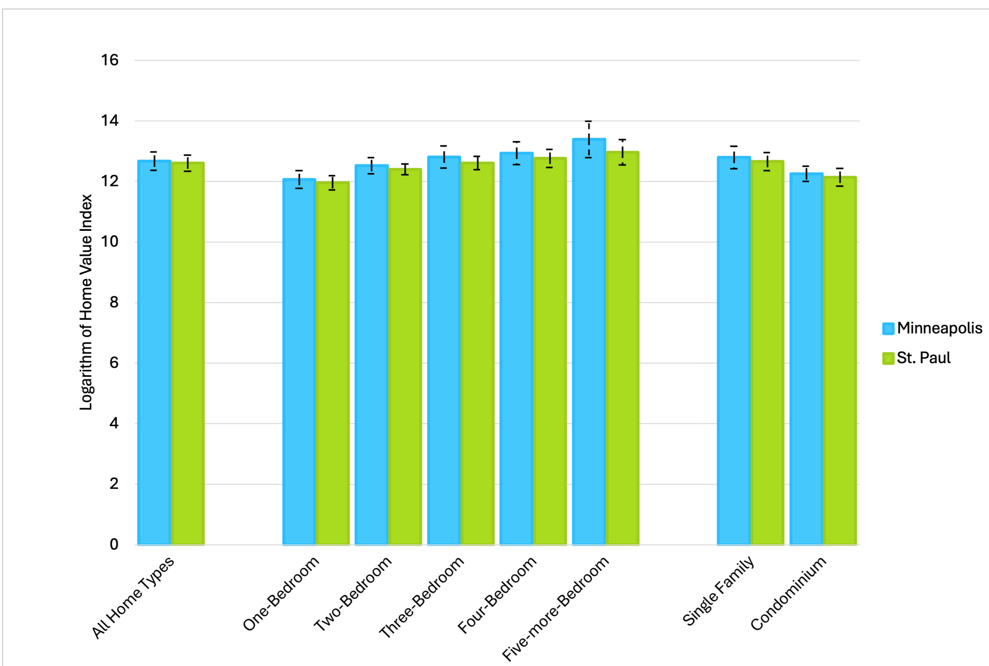

Figure 2: Logarithm of Home Value Index by City and Home Type

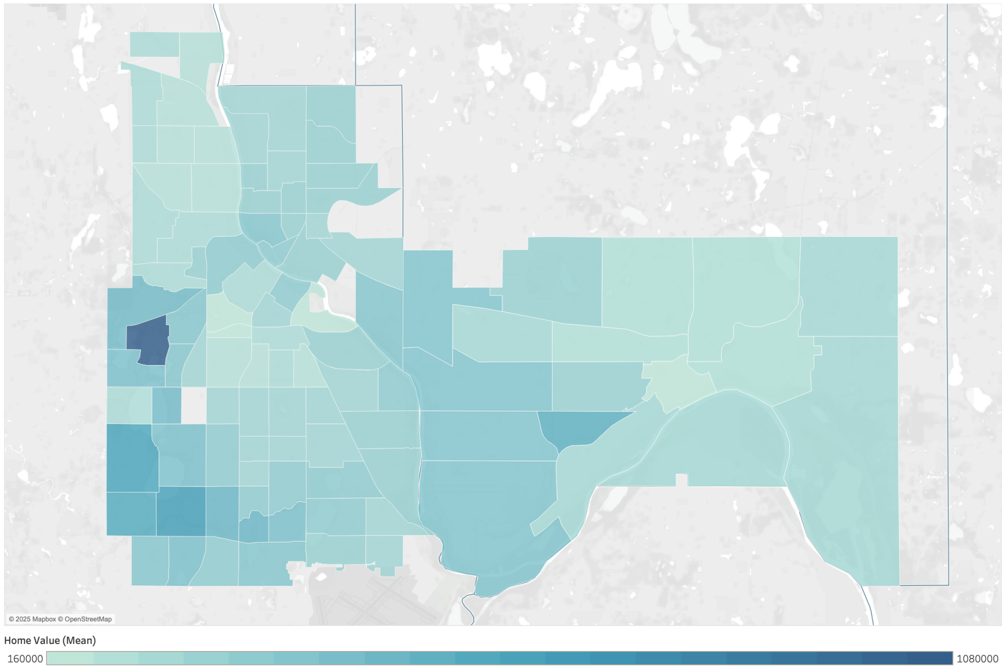

Figure 3: Average Home Value ($) of Minneapolis and Saint Paul by Neighborhood

Table 7: HOME VALUE (1K $), SAINT PAUL NEIGHBORHOODS (JUNE 2022 - JANUARY 2023)

Neighborhood	Mean	SD
Battle Creek	297.12	5.09
Como	313.46	5.44
Dayton's Bluff	231.35	3.72
Downtown	189.79	2.59
Greater Eastside	256.05	4.42
Highland	418.23	6.22
Highwood	355.94	5.88
Macalester-Groveland	427.47	7.65
Merriam Park	408.17	7.20
Midway	277.96	4.71
North End	225.86	3.56
Payne Phalen	245.78	3.94
St. Anthony Park	405.17	8.04
Summit Hill	528.31	7.83
Summit-University	301.77	3.90
Sun Ray	260.16	4.08
Thomas Dale	218.70	3.45
West 7th	269.97	4.64
West Side	253.97	4.57

Table 8: HOME VALUE (1K $), MINNEAPOLIS NEIGHBORHOODS (JUNE 2022 - JANUARY 2023)

Neighborhood	Mean	SD	Neighborhood	Mean	SD
Armatage	400.10	4.06	Logan Park	313.56	5.13
Audubon Park	322.67	5.36	Longfellow	306.90	4.53
Bancroft	299.01	3.88	Loring Park	189.57	3.21
Beltrami	302.27	5.63	Lowry Hill	382.80	6.86
Bottineau	324.84	5.49	Lowry Hill East	304.88	5.38
Bryant	306.28	5.83	Lyndale	295.61	3.62
Bryn Mawr	476.52	7.76	Lynnhurst	674.85	7.51
Calhoun	359.36	4.43	Marcy Holmes	323.97	5.06
Cedar-Isles-Dean	449.99	5.44	Marshall Terrace	284.92	4.29
Cedar-Riverside	174.79	2.98	Mckinley	205.06	2.99
Central	292.54	5.42	Midtown Phillips	235.78	4.29
Cleveland	241.35	3.84	Minnehaha	284.13	3.23
Columbia Park	289.59	4.68	Morris Park	279.14	4.41
Cooper	352.59	4.95	Near North	255.84	3.16
Corcoran	277.23	3.56	North Loop	345.05	6.30
Diamond Lake	397.23	3.86	Northeast Park	307.28	6.58
Downtown East	359.67	7.60	Northrup	364.58	5.14
Downtown West	248.05	4.04	Page	505.19	6.77
East Bank-Nicollet Island	364.99	9.30	Phillips West	229.93	3.64
East Calhoun	468.80	5.60	Powderhorn Park	281.43	4.96
East Harriet	428.52	5.80	Prospect Park	402.14	6.20
East Isles	393.58	5.83	Regina	302.18	4.64
East Phillips	223.20	3.84	Saint Anthony East	337.25	6.39
Elliot Park	286.36	8.89	Saint Anthony West	410.54	8.88
Ericsson	352.96	4.27	Seward	318.91	4.03
Field	364.62	4.90	Sheridan	307.39	6.46
Folwell	208.39	3.41	Shingle Creek	250.20	3.01
Fuller Tangletown	524.79	6.67	Southeast Como	303.47	4.70
Fulton	568.26	4.67	Standish	303.48	4.26
Hale	446.52	5.14	Stevens Square	161.71	3.00
Harrison	262.63	4.62	Sumner-Glenwood	317.07	4.25
Hawthorne	230.62	3.77	Ventura Village	245.76	4.32
Hiawatha	323.39	4.42	Victory	265.72	4.24
Holland	284.08	3.74	Waite Park	316.06	4.09
Howe	319.05	4.17	Webber-Camden	222.64	3.72
Jordan	217.22	2.20	Wenonah	316.10	3.70
Keewaydin	354.55	4.32	West Calhoun	270.12	3.37
Kenny	424.22	4.86	Whittier	198.70	2.89
Kenwood	1,075.29	15.58	Willard Hay	245.14	4.44
Kingfield	379.66	5.76	Windom	365.57	4.51
Lind-Bohanon	225.55	2.83	Windom Park	337.29	4.77
Linden Hills	608.90	5.23			

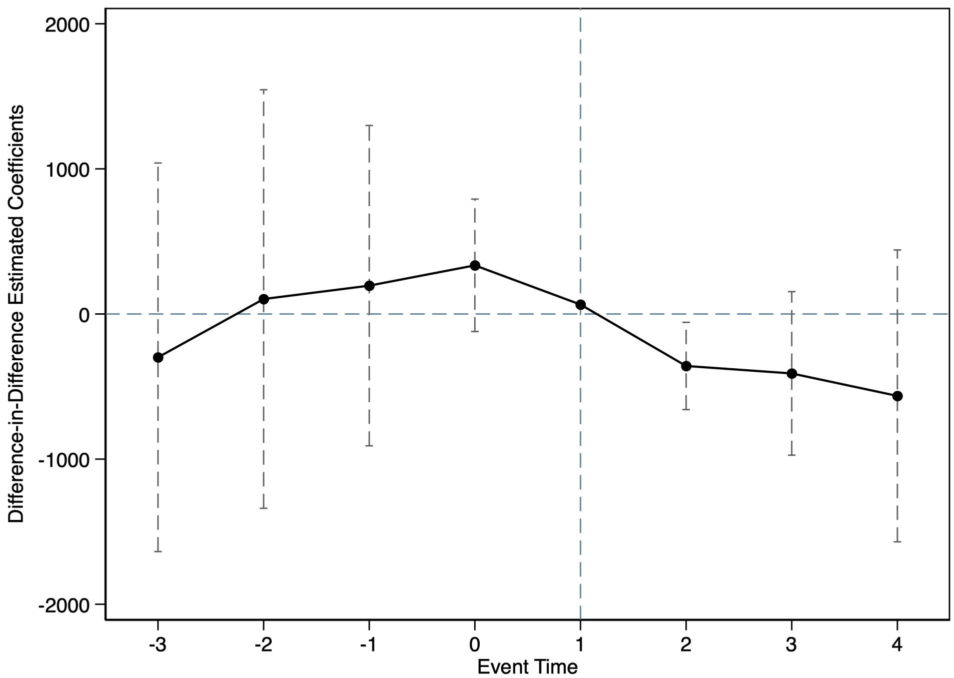

Figure 4: Estimates of Rent Stabilization's Effects on Home Value

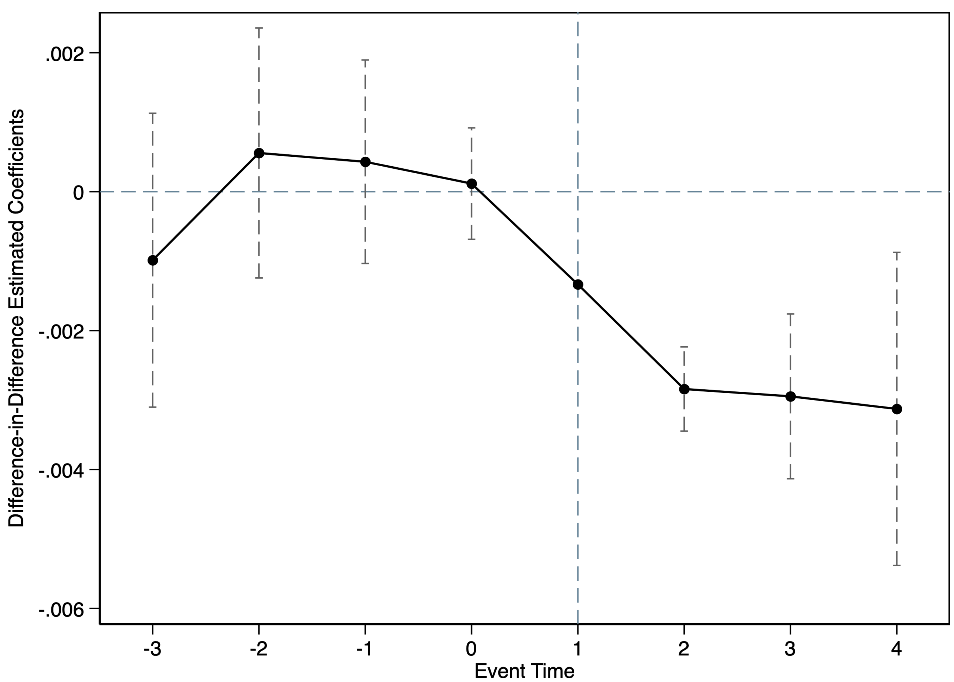

Figure 5: Estimates of Rent Stabilization's Effects on Log Home Value

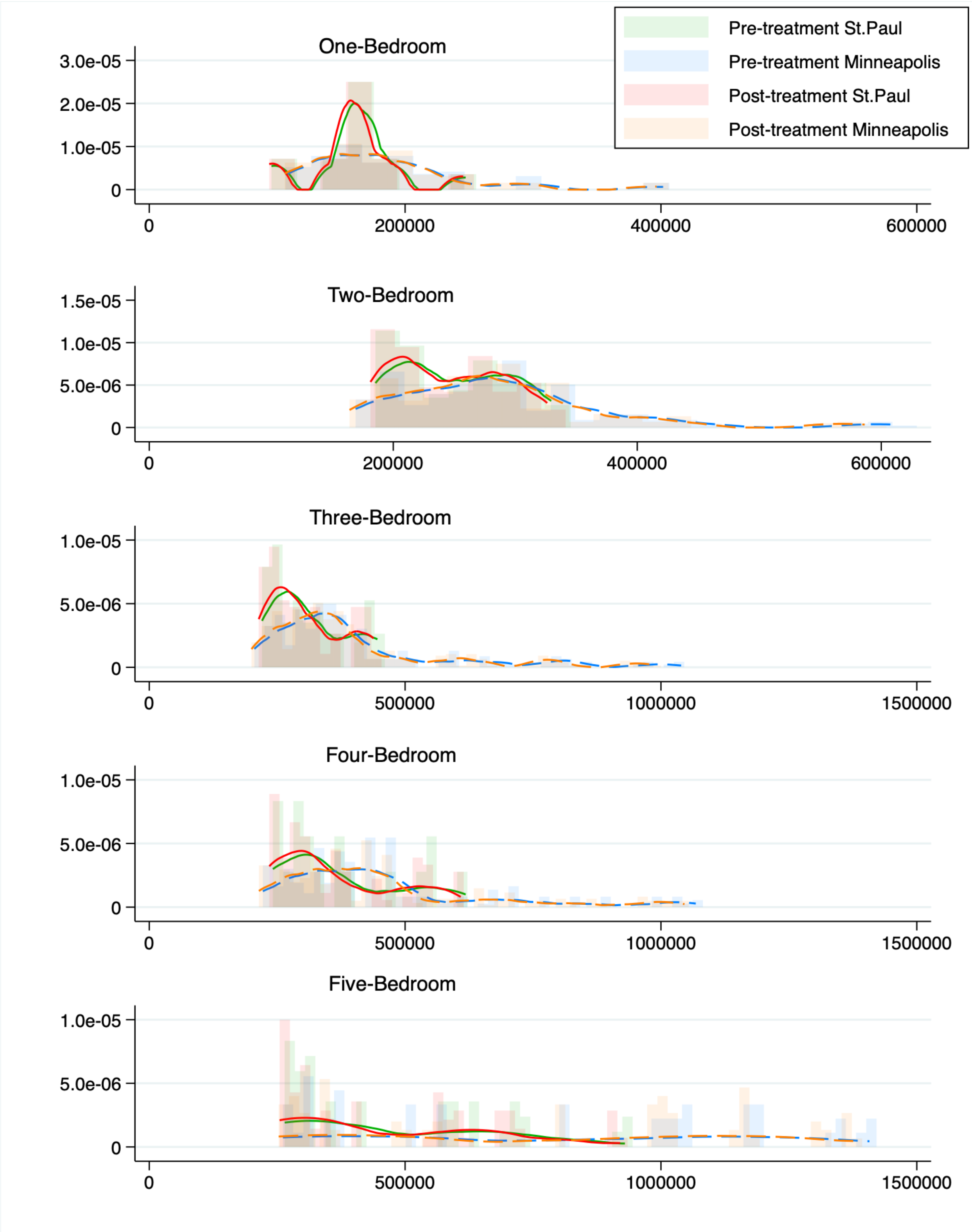

Figure 6: Distribution of Home Value Index (Number of Bedrooms)

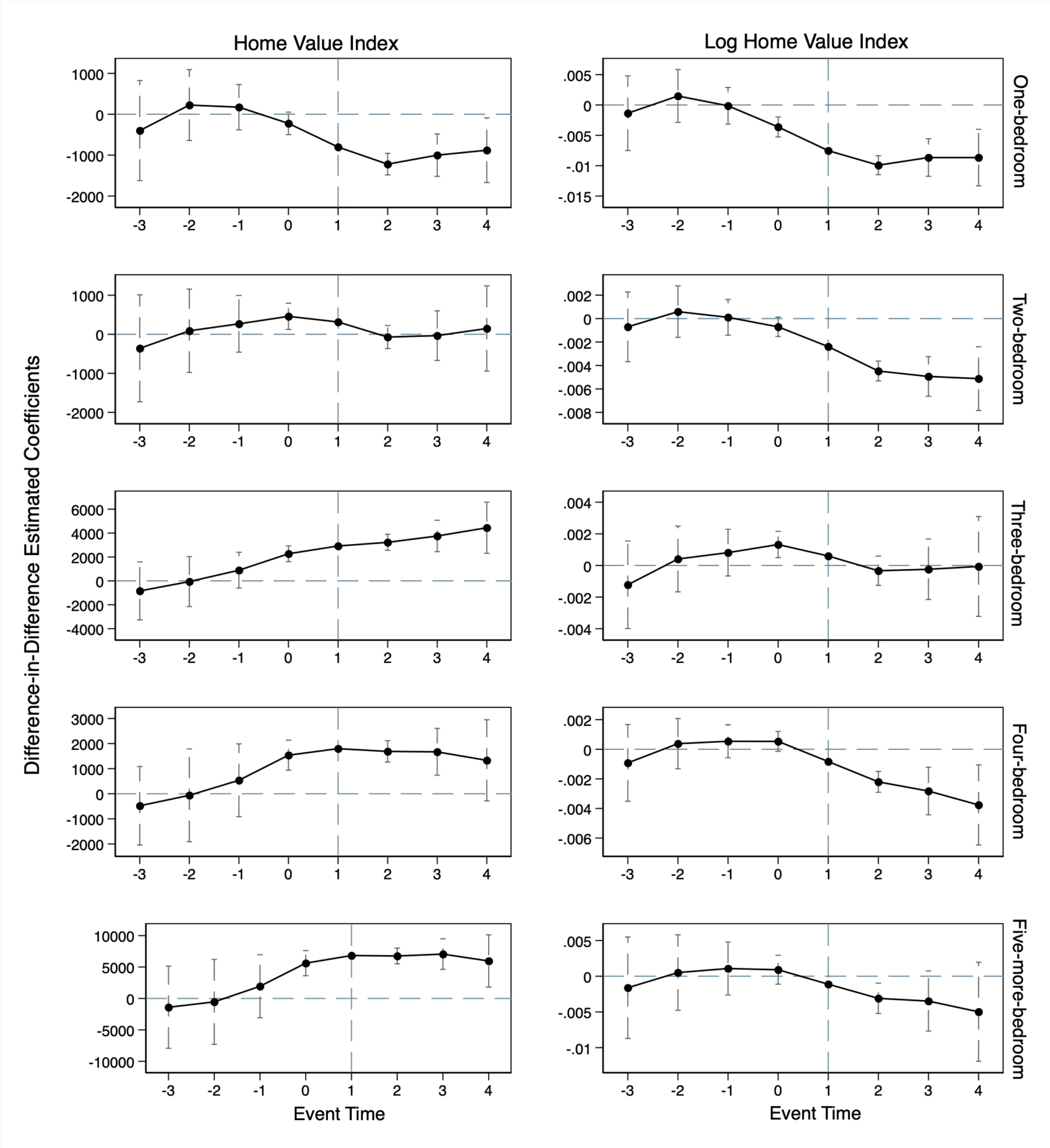

Figure 7: Estimates of Rent Stabilization's Effects by Home Types (Number of Bedrooms)

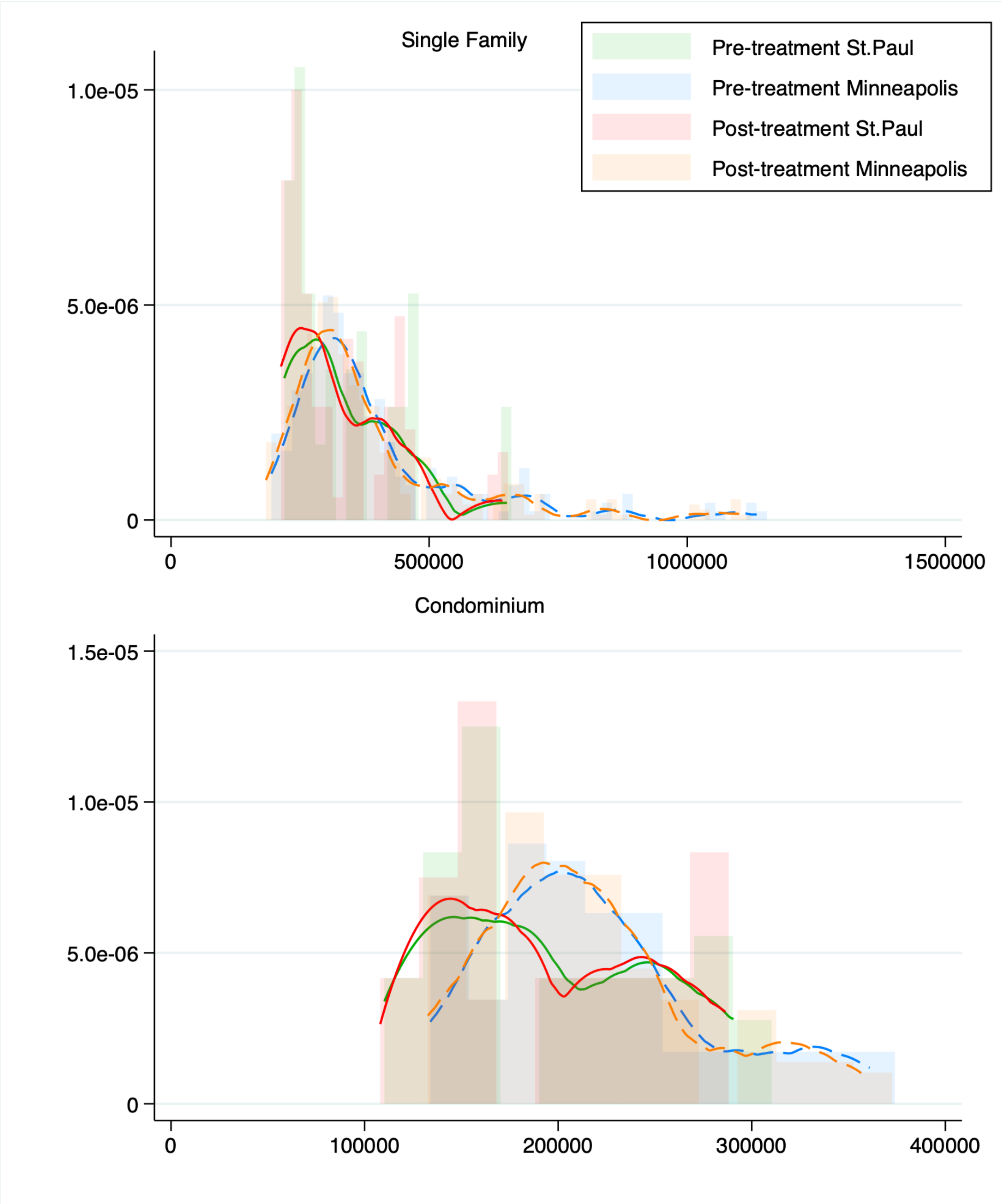

Figure 8: Distribution of Home Value Index (Building Structure)

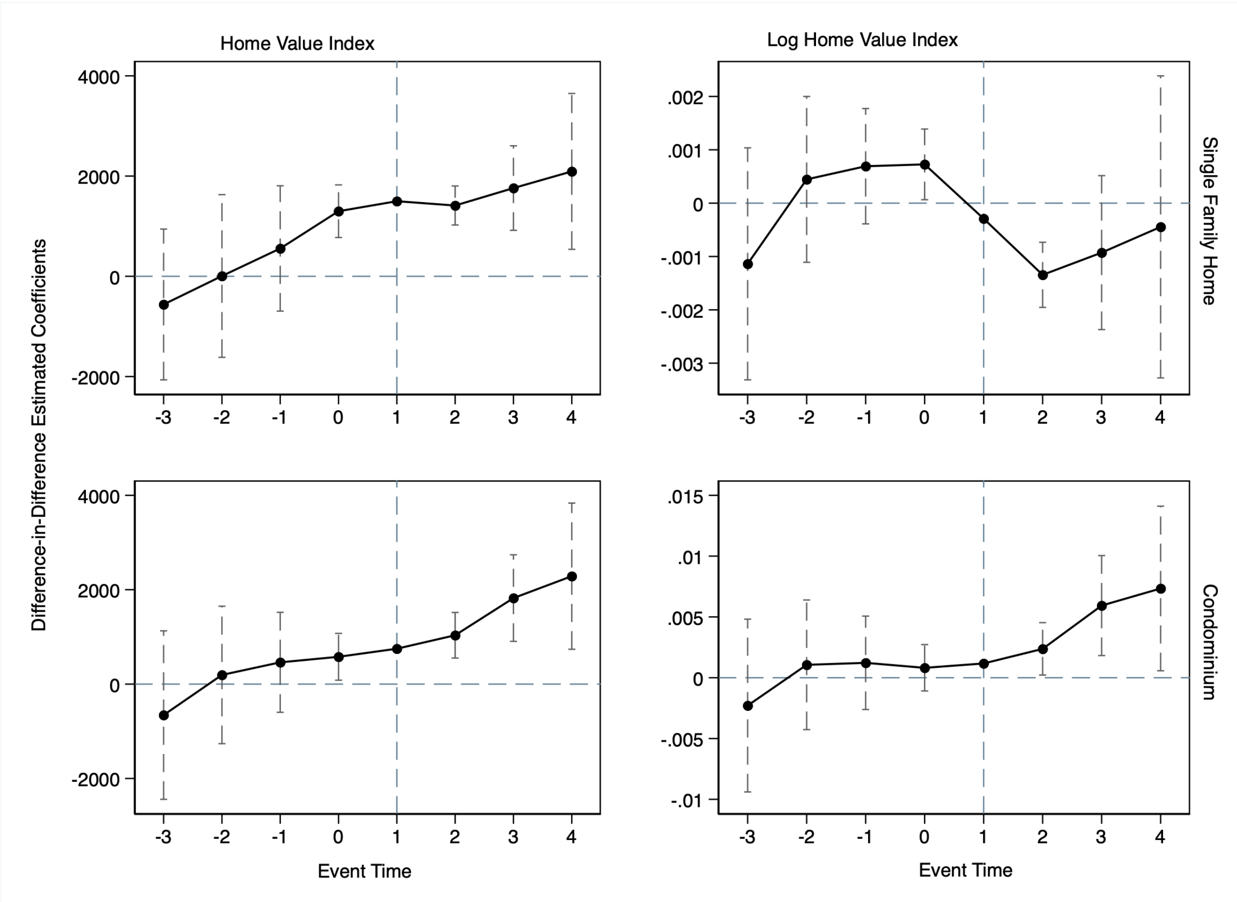

Figure 9: Estimates of Rent Stabilization's Effects by Home Types (Building Structure)

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