When do homeowners vote against their home value?: Prospect theory in sociotropic voting

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Abstract

The vast majority of homeowners want their own home value to increase or at least stay the same. Yet, many homeowners living in expensive housing markets also believe that city housing prices should decrease. When presented with a proposal for new housing supply, I find that these 'conflicted' homeowners are willing to forego gains in their own home value for the sake of lowering prices citywide. However, the same homeowners are unwilling to accept losses, reverting to personal interest when they believe their home value will decrease with the new supply. To test this theory, I examine attitudes and voting behavior from two original data sources, a 3,019 respondent national survey and a 1,660 voter exit poll in San Francisco. These findings advance our understanding of political behavior by empirically demonstrating the role of prospect theory in sociotropic voting. As a policy implication, this behavior supports the use of a home value insurance mechanism to mitigate homeowner pocketbook opposition to new housing supply.

*This research was supported by grants from the Joint Center for Housing Studies at Harvard, the Foundations of Human Behavior Initiative, and Time-Sharing Experiments for Social Scientists (TESS). Special thanks for feedback from Ryan Enos, Jennifer Hochschild, Ed Glaeser, Chase Harrison, the American Politics Research Workshop, the Urban Social Processes Workshop, and the Joint Center for Housing Studies Seminar Series.

As America's most expensive cities continue to appreciate, homeowners are quickly blamed for opposing new construction and benefiting from the rising tide. Indeed, nearly every model of local political economy begins with the assumption that homeowners want their home value to stay the same or increase (Fischel, 2001; Ortalo-Magné and Prat, 2014). This assumption is not unwarranted. Most homeowners see their home as either an investment, something which they expect to appreciate, or an asset against which they can borrow. As a result, risk-averse homeowners will tend to oppose policies which threaten to lower their home value (Fischel, 2001).

But just because most homeowners want their own home value to increase does not mean they want housing prices to increase citywide. Homeowners in expensive markets often believe that lower citywide housing prices are in the public interest. For instance, an exit poll I conducted of San Francisco voters found that 41 percent of sampled homeowners simultaneously believe that housing prices are too high citywide, but want their own home value to stay the same or increase. These 'conflicted' homeowners face a political bind. When offered a policy potentially lowering housing prices, will they vote with their pocketbook, opposing a threat to their own home value? Or will they vote with the public interest, supporting the goal of lower city prices? Despite our fundamental assumptions, when do homeowners vote against their home value?

In this paper, I argue that homeowners who have conflicting goals about housing prices are willing to forego gains in their own home value to help lower citywide housing prices. Just as a wealthy voter may support a tax that she will disproportionately bear, homeowners may vote against the appreciation of their own home. But there is a difference between voting to lower home value versus voting to *not* maximize it. Phrased differently, homeowners weigh losses of home value more heavily than foregone gains. When 'conflicted' homeowners believe that their home value will decrease because of the new supply, they will no longer vote based on the public interest, but rather vote to protect their home value. Furthermore, this trade-off between public and pocketbook interests varies by the housing's price point, with affordable housing triggering consistent personal interest voting and luxury housing driving an emphasis on public interest voting. These findings advance our understanding of voting behavior by incorporating prospect theory and the framework of gains and losses into self-interested voting. From a public policy perspective, the findings support the use of a home value insurance mechanism to mitigate homeowner opposition to new supply.

As a policy domain, the housing supply presents an ideal test for combining sociotropic voting and prospect theory. Though little association between personal interest and vote choice has been found at the national level (Lewin, 1991), a test of pocketbook voting using local housing policy has several advantages. First, national-level policy outcomes can be difficult for individuals to connect to their own well-being (Fiorina, 1981). In contrast, local housing policy directly connects political outcomes to a voter's own home value. Second, as captured in the San Francisco data, the direct democracy of ballot voting provides a clearer signal of voter preferences compared to traditional measures, such as support for the incumbent candidate. Third, the unidirectional interest of national and personal economic growth makes it difficult to separate public interest from pocketbook interest. In contrast, this study looks at homeowners with conflicting goals for city prices and home value, revealing a more observable trade-off between personal and public interest. These facets of homeowners and housing policy create not only one of the clearest tests of pocketbook voting but perhaps the most favorable conditions to observe personal interest driving political behavior.

In the remainder of this paper, I first frame the dramatic rise of housing prices and their broader impacts for society. Then, I outline the importance of homeowner political behavior, as motivated by home values. After showing where existing theories fall short, I discuss how prospect theory influences political behavior. After reviewing my data sources and methods, I test the hypotheses and close by discussing their theoretical importance as well as contribution to public policy.

1 Framing and Context

Since 1980, housing prices in the nation's most productive metropolitan areas have dramatically increased, with real prices doubling in New York City and Los Angeles while nearly tripling in San Francisco (Glaeser et al., 2005; **?**). This continued appreciation is largely driven by an assortment of regulations, from limits on the size and scale of new development to direct fees and longer permit approval processes (Quigley and Raphael, 2005; Glaeser and Ward, 2009; Mayer and Somerville, 2000). Even after controlling for geographic constraints (Saiz, 2010), these regulations increase the cost of building new housing. As a result, the housing supply in high-wage cities has not kept up with demand, causing the price of existing units to increase.

For inelastic cities, a stagnant housing supply not only increases the rent burden of households in the market, but creates an artificial barrier to entry for low- and moderate-income households(Massey and Rothwell, 2009). For those priced out, these cities harbor important opportunities compared to their more affordable counterparts, such as higher rates of skill acquisition (Rosenthal and Strange, 2008), longer life expectancies (Singh and Siahpush, 2014), and greater chances of intergenerational upward mobility (Chetty and Hendren, 2015; Chetty et al., 2016). These consequences extend beyond the individual citizen, affecting the nation as a whole. By restricting the supply of new housing, development regulations limit the ability of these cities to increase in density, foregoing benefits such as increased economic productivity (Ciccone and Hall, 1996), more rapid rates of technological innovation (Carlino et al., 2007), and greater environmental sustainability (Jones and Kammen, 2014). Indeed, Hsieh and Moretti (2015) estimates that lowering housing constraints in just New York, San Francisco, and San Jose to those of the median U.S. city would increase U.S. GDP by nearly 10%. Together, these outcomes expand the problem's scope from simply rising rents in desirable cities to undermining the nation's economic and environmental vitality.

Yet despite these outcomes, little behavioral data exists on how individuals perceive and respond to new housing development. Instead, our understanding of these development regulations is largely limited to municipal-level factors affecting the decision making process (Peterson, 1981; Brueckner, 1998). Meanwhile, individual-level research is hampered by either vague terminology such as attitudes towards non-specific "growth" (Wassmer and Lascher, 2006; Chapin and Connerly, 2004; Mohamed, 2008) or insufficient generalizability beyond one specific municipality (Gottdiener and Neiman, 1981). To date, the dominant narrative consists of risk averse homeowners blocking new development to protect their most valuable asset, their homes (Fischel, 2001). But this model falls short in explaining the expansion of restrictions in cities with a minority of homeowners (Been et al., 2014), as well as the role of non-pecuniary attitudes towards new housing, such as public interest and political ideology.

2 Theory and Hypotheses

Despite its shortcomings, the focus on homeowners as a driving force in restricting supply is a useful starting point. Homeowners have great financial incentive and political ability to unite as the dominant municipal voting bloc in protection of their home values. For homeowners, new supply threatens their home value in two ways. First, congestion and an influx of outsiders represent spatially concentrated threats, increasing in severity the nearer a home is to new development. As a result, a homeowner who does not generally care about new housing in their city may grow hostile when that housing is proposed for their own neighborhood. This seemingly hypocritical, but economically rational response is named NIMBYism for 'Not in my back yard'.

The second threat to homeowners is a drop in home values due to an increased use of public goods, such as schools and law enforcement. Typically funded by property taxes, these public goods are equally accessible regardless of how much a resident pays in property taxes. In other words, allowing smaller homes which pay less in taxes to be built would redistribute the wealth of current homeowners for the benefit of renters and would-be homeowners. Unsurprisingly, current homeowners often support regulations preventing the construction of smaller, more affordable homes, or 'upzoning' (Hamilton et al., 1975).

Even with these threats, a national survey I conducted found that while 97% of the homeowners sampled wanted their home value to increase or stay the same, 12% also believe that lower housing prices are in their city's best interest. Within my San Francisco exit poll, this 'conflict' within homeowners grows, with over 41% wanting both city prices to decrease and their own home value to stay the same or increase. In short, despite the fundamental assumptions of local political economy, there appears to be room for public interest voting.

There is reason to believe that homeowners will look beyond their own home value. Broadly speaking, direct self-interest is a poor predictor of policy preferences (Sears and Funk, 1991). When considering support for incumbent congressional candidates, voters weigh national economic outcomes more heavily than their personal well-being (Kinder and Kiewiet, 1981). In the context of trade policy, voters are less driven by personal connections to trade than whether they believe that free trade is good for the American economy (Mansfield and Mutz, 2009). While these cases may involve nebulous connections between policy and personal outcomes, the balance of research has shown a willingness of voters to emphasize public interest in voting. As a result, a homeowner who believe that lower prices are in their city's best interest may vote for the good of the city, even at the expense of his own pocketbook interest.

But there is a shortfall to this emphasis on public interest voting. Existing studies of sociotropic behavior unanimously ignore the direction of the personal cost, whether the voter is foregoing a gain or accepting a loss. In a basic utility model, the pain one feels from losing $5 is equal to the pleasure they experience when receiving $5. However, behavioral studies consistently show that the pain of actually losing that $5 is greater than the complementary pleasure (Kahneman and Tversky, 1979). In other words, people assign greater weight to losses than they do to gains, a finding known as 'loss aversion' that falls under Kahneman and Tversky (1979)'s prospect theory. Applied to housing, loss aversion predicts that the pain homeowners feel from a 5% decrease in their home value is greater than the pleasure they receive from a 5% increase. Consequently, I expect a homeowner's willingness to support the public interest of lower housing prices is contingent on whether they believe that are foregoing a gain in personal home value or accepting a loss. From this foundation, I argue that though homeowners are willing to forego gains in home value in pursuit of lower prices citywide, but they are unwilling to lose home value.

As a corollary, this tradeoff between personal and public interest will vary based on the price point of the new housing. Affordable housing has a racial and economic stereotype of spatially concentrated, negative spillovers such as crime and noise. These spillovers may directly harm a nearby home's value independent of any price change in the citywide housing market. Thus, when presented with a proposal for more affordable housing, homeowners will feel a personal threat to home value causing them to weigh their own housing price change more heavily than that citywide. In contrast, luxury housing has far fewer spatially localized spillovers. Instead, any depreciation in personal home value will likely come from an overall decrease in citywide housing prices. In turn, when presented with an increase in the supply of luxury housing, homeowners will consider the effects on citywide prices first, causing them to weigh city effects more heavily than personal effects.

From this theory, three testable hypotheses emerge:

1. For 'conflicted' homeowners, the effect of new housing on city prices has an equal or greater influence on vote choice than the effects on personal home value.

2. For 'conflicted' homeowners, a net decrease in personal home value has a greater effect on vote choice than a net decrease in city prices.

3. Affordable housing is linked to a consistently stronger relationship between personal effects and vote choice, while luxury housing drives a consistently stronger link between citywide effects and vote choice.

3 Data and Methods

This union of voting behavior and prospect theory relies on the individual-level behavior of homeowners in response to various housing supply scenarios. To test these hypotheses, I use two original data sources. First, I conducted a 3,019 respondent national survey of attitudes, including a policy proposal for a 10% increase in a respondent's municipal housing supply. To assess the robustness of these attitudinal findings, I leveraged the presence of housing-related ballot initiatives during the Fall 2015 San Francisco municipal election, conducting an exit poll of 1,660 voters. As a cross-referencing measure, I recruited 152 of the exit poll respondents to also complete the national survey and survey experiments.

3.1 National Survey

Administered by the online data collection firm GfK, the national survey sampled respondents from a list of 4,068 zip codes in which the local government both has clear control over housing policy and no other local governments are nested within.[1] From these zipcodes, respondents received a survey composed of a conjoint experiment and policy proposal, with the order randomized.

This paper focuses exclusively on homeowners and the policy proposal questions. Along with the conjoint experiment, respondents answered questions pertaining to a 10% percent increase in their city or town's housing supply. First, respondents were asked whether they wanted their home value or rent to increase or decrease over the next five years, with options ranging from -15% to +15%. The same question was asked for city housing prices.[2] Next, respondents were asked how a 10% percent increase in their city's housing supply would affect their own home value or rent as well as citywide housing prices. To avoid the cognitive challenges of conceptualizing a 10% increase in the housing supply, the number of existing units in each respondent's municipality was piped into the survey based on zip code. For example, a resident of Somerville, MA would have received the following prompt:

"From your ZIP code, you live in Somerville, which has 33,044 housing units (homes and apartments). Imagine Somerville lowers development restrictions, making it easier to build new housing units. As a result, 3,304 **more** units, with a similar mix of homes and apartments, will be built

[1]This survey was supported through a grant from Time-sharing Experiments for the Social Sciences (TESS). For an example of the decision rules, consider Los Angeles County which regulates its own housing supply. The county contains 88 independent municipalities. For residents of Los Angeles County, proposing a 10% increase in the housing supply would raise complications of where the county has jurisdiction and where municipal boundaries exist. For this reason, zip codes in areas like Los Angeles County were removed from the sample.

[2]The order of all questions pertaining to personal and citywide housing prices was randomized.

over the next five years."[3]

The effects of new supply on personal and city housing prices were measured by subtracting the expected price change given no new supply from expected price change given the 10% increase, allowing the net effect to account for independent appreciation. Finally, respondents were asked their support for the 10% supply increase using a 7 point scale as well as whether they would ban the construction of new housing in their own neighborhood.[4]

To test the importance of city housing prices versus home value, I place both expected personal and citywide price effects in a linear model with support for the housing supply proposal as the dependent variable, a method similar to Mansfield and Mutz (2009), Kinder and Kiewiet (1981), and Killian et al. (2008). I then assess whether each coefficient is statistically different than zero, followed by an F-test to test the null hypothesis that the absolute value of the coefficients are equivalent. To see how the relationship between price effects and support varies by gains and losses, I conduct the same analysis but dichotomize the price effects, changing the independent variables from a percent change in prices to whether the supply will cause a net decrease in prices. Again, I compare the magnitude of the coefficients and assess their equivalency. These two tests show me 1) whether a *change* in city prices or personal home value is more predictive of voter support for new housing and 2) whether a *drop* in city prices or personal home value is more predictive of support.

3.2 San Francisco Survey

Complementing the national survey, behavioral data for this paper is drawn from an original survey of 1,660 voters conducted on Election Day, November 3, 2015, in San Francisco.[5] This exit poll has several advantages over the national survey. First, exit poll respondents voiced their opinions on actual policies with real consequences if passed, suggesting a gravity behind the opinions absent in most survey responses. Second, these policies were debated over several months of campaigning, allowing respondents to form considered opinions rather than off the cuff, 'top of the head' responses. Third, many argued that housing was the dominant issue of the election (Green, 2015 June 3), leading the voting population to be particularly aware, informed, and interested in the survey topic. Finally, the time and resources spent voting in an off-cycle election suggest that the voting population was more similar to those willing to attend a planning meeting or influence citywide housing policy outside of the voting booth, heightening the external validity of the findings to politically active populations in other cities. And while San Francisco is not the average American city, this study is designed to unpack housing attitudes within other highly regulated urban cores. Constraining external validity to other inelastic cities, such as Los Angeles and New York City, moderates San Francisco's superlatives.

To conduct the study, 65 pollsters were hired and given a one-hour training session on how to administer the paper survey. On Election Day, these pollsters were sent to 26 polling locations sampled to maximize geographic variation as well as oversample potentially low-turnout conservative voters (See Figure 1). Workers were instructed to approach every voter leaving their polling station, shifting to a 1/n format in periods of high turnout to avoid surveyor bias. Voters agreeing

[3]The question specifies an easing of development restrictions to create a realistic mechanism for the construction of new housing. In contrast, referencing a spontaneous growth spurt without the easing of development restrictions could imply either a sudden boom in the local economy or a government subsidized program.

[4]A full description of the survey instrument is printed in the Appendix.

[5]This exit poll was supported by grants from the Joint Center for Housing Studies at Harvard and the Foundations of Human Behavior Initiative.

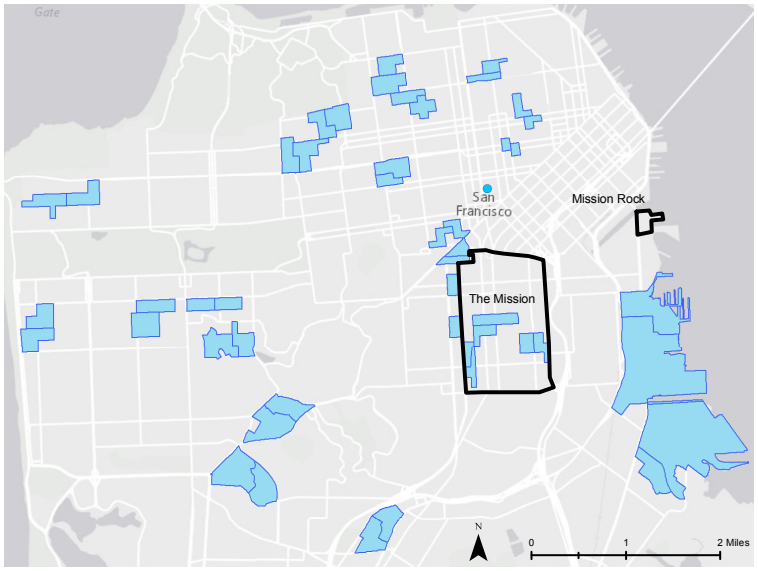

Figure 1: Polling locations sampled

to complete the survey were asked if they were a homeowner or a renter, then handed the appropriate survey on a clipboard. Respondents were instructed to complete the survey in private, then directly submit the survey to a closed ballot box, mitigating the social desirability bias of handing responses back to the pollster. Over 45 percent of voters approached agreed to complete the survey, totaling 1,660 surveys.

The survey began by recording vote choice for four of the housing-related ballot propositions. For this paper, the ballot proposition of interest is Proposition I, which would have implemented an 18-month ban on the development of new housing in the Mission District, a historically working class, Latino neighborhood. To be exempt from the moratorium, a development would have needed to a) consist of fewer than 6 units or b) designate 100% of its units as affordable housing. The proposition failed, capturing only 43 percent of the vote.

In addition to vote choice, the survey also recorded the expected price effects of Proposition I, asking:

- "If **Proposition I** passes, by next year, housing prices in **the Mission District** will...?"
- "If **Proposition I** passes, by next year, **your** home value prices in **the Mission District** will...?"

Respondents could answer by circling a value from -15% to +15%.[6]

Following the ballot propositions, the survey contained an experiment based on a hypothetical ballot proposition which would have approved a 10% increase in the city's housing supply. As the control condition, the survey read:

- Control Condition: "If there were a proposition to build 10% more housing in San Francisco, how would you vote on that proposition?"[7]

[6]While these price effects do not account for natural appreciation, the sample of 152 respondents who completed both the exit poll and the national survey showed a .67 correlation between the effect of a ten percent increase in housing supply across both surveys. In other words, expected price increases in the exit poll were very highly correlated with the price effects of the national survey, which accounted for natural appreciation.

[7]Voters were not expected to visualize the exact magnitude of a 10% increase in housing stock given San Francisco

While one third of respondents received the control condition, the remaining two thirds received either an 'affordable' treatment or a 'luxury' treatment, as written:

While one third of respondents received the control condition, the remaining two thirds received either an 'affordable' treatment or a 'luxury' treatment, as written:

- Affordable Treatment: "If there were a proposition to build 10% more housing in San Francisco and all of that housing would be affordable, how would you vote on that proposition?"
- Luxury Treatment: "If there were a proposition to build 10% more housing in San Francisco and all of that housing would be luxury, how would you vote on that proposition?"[8]

After recording vote choice on the hypothetical proposition, the survey asked how the 10% supply increase would affect the respondent's home value or rent as well as citywide housing prices. Like the national survey, respondents were also asked their preference for changes in personal and citywide housing prices.[9] The relationship between voting behavior and price effects was analyzed using the same methods as the national survey.

4 Results

Before testing the hypotheses, I first show that many homeowners in both samples want city housing prices to decrease, but their own home value to increase or stay the same. Next, I show the expected price effects of each policy proposal. I then demonstrate that the effect of citywide price changes on support for new housing is similar if not greater than that of changes in personal home value. However, I also show that among homeowners who believe that their home value will experience a net decrease, personal home values dominate. I reassess these effects with my exit poll data, experimentally varying the price point of the new housing. Finally, I conduct the same tests on behavioral data, showing how loss aversion interacts with voting behavior for Proposition I.

4.1 Price Motivations

Figure 2 shows the interest of homeowners in the national sample, with personal home value preferences on top and citywide price changes on bottom. While personal home changes are almost universally positive, 12% of the sample believe that it is in the best interest of their city for housing prices to decrease. Figure 3 shows the same breakdown within the San Francisco sample. Here, 41% of homeowners sampled believe that it is in the city's best interest for prices to decrease, despite also wanting their own home values to remain the same or increase.

had permitted a 0.5% increase in housing annually over the preceding 10 years(Department, 2014). However, the prompt should serve as a clear up or down vote on new, non-spatially allocated housing at the aggregate level. Within my recontacted sample, support for the control condition and the more finely articulated 10% supply question on the national survey has a .47 correlation, considered to be a moderate positive correlation.

[8]One concern is that the luxury treatment may signal that the luxury housing would be government subsidized. There are two reasons to reject this concern. First, housing-related ballot propositions are common in San Francisco. In 2013, voters rejected a ballot proposition raising building heights for a specific luxury development on the waterfront. In 2014, voters approved a proposition mandating ballot control over future increases in waterfront building heights, with a campaign focused on luxury housing. Simply put, the permitting of luxury housing via ballot initiative is not without precedent and has not been linked to a direct government subsidy. Second, support for the luxury treatment is greatest among high-income and conservative respondents, groups traditionally opposed to government subsidies. Were the luxury housing interpreted as a subsidy, I would expect support for luxury housing to be at least evenly opposed by liberals and conservatives.

[9]A full description of the survey instrument is printed in the Appendix.

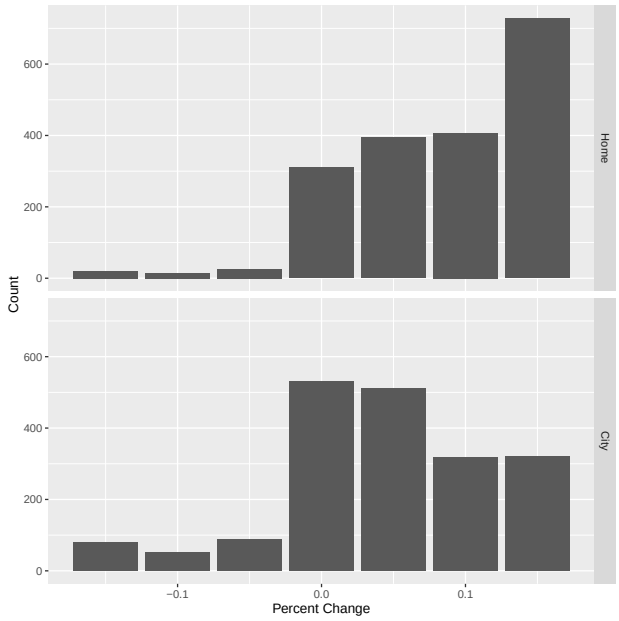

Figure 2: Preferences for the change in personal home value (top) and citywide housing prices (bottom), national sample.

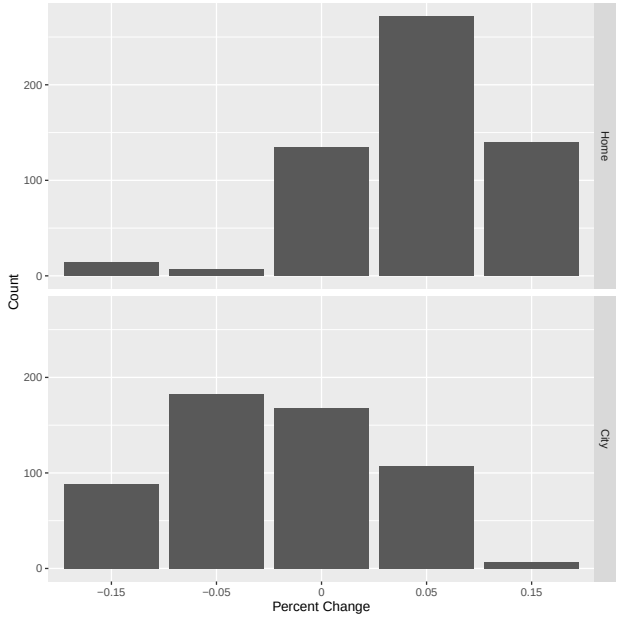

Figure 3: Preferences for the change in personal home value (top) and citywide housing prices (bottom), San Francisco sample.

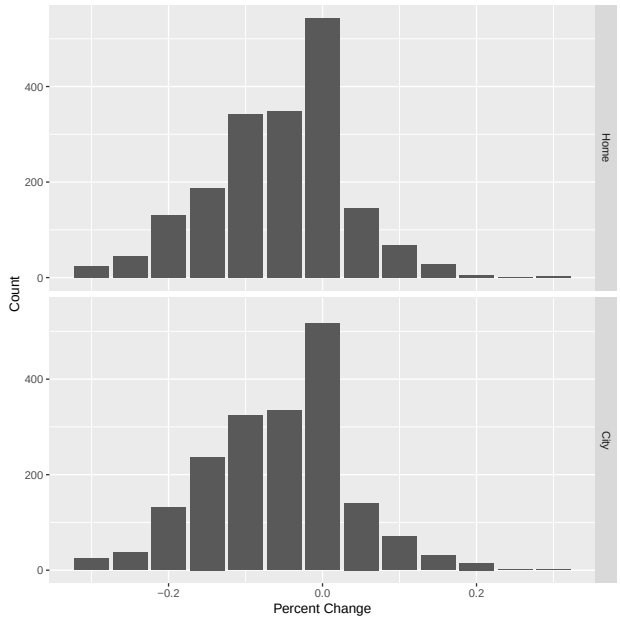

Figure 4: Expected effects of a ten percent increase in municipal housing supply, national sample

4.2 National Survey

In the national sample, respondents were presented with a 10% increase in their municipality's housing supply, then asked how they expected their own home value as well as citywide housing prices to change over the next five years. Figure 4 shows the expected effect of this supply on both outcomes, with the effect centered to account for inflation independent of the supply increase. Generally, homeowners believe that new supply will either have no effect or a negative effect on housing prices. After stating their expected price effects, respondents were asked if they supported the supply increase and given a 7-point scale of support. For intuitiveness, I collapsed support into a dummy variable with 0 representing 'Oppose' and 1 representing 'Support'.[10]

For the first test, Table 1 shows the effects of personal and citywide price changes on support for the new housing supply. The six models presented can be paired by the subset of homeowners analyzed. From the left, Models 1 and 2 are composed of homeowners who believe that lower prices are in their city's best interest ('City Low'). As the model pairs move right, the stringency of the sampling restriction increases. Models 3 and 4 consist of homeowners who want city prices to decrease but their own home value to stay the same or increase ('City Low/Home >='), whereas Models 5 and 6 only contain homeowners who want city prices to decrease but their own home value to increase ('City Low/Home >'). In this sense, the different model pairs serve as robustness checks, with Models 5 and 6 isolating the most 'conflicted' homeowners.

Within each pair, the odd numbered model shows the effects of percentage changes in prices, with a unit increase representing a 100% increase in value. The even numbered models show the effects of home value and city prices when those percent changes are operationalized as a drop in prices. For 'Home (Drop)', a unit increase represents shifting from a rise or stability in home value to a net decrease in home value. To test whether city prices or home values have a greater relationship with vote choice, price changes are tested in the same model and the magnitude of the coefficients is compared using an F-test for equivalency. Finally, each model includes covariates for

[10]Effects using the 7-point scale are not substantively different and are included in the Appendix.

respondent income, ideology, ethnicity, age, education, gender, as well as zip code housing prices and recent appreciation. All models use robust standard errors and models displaying full controls are included in the Appendix.

Table 1: Price Effects on Support for Housing, National Sample

	City Low		City Low/Home >=		City </Home >	
	(1)	(2)	(3)	(4)	(5)	(6)
Home (Pct)	1.07		1.04		1.41	
	(.38)		(.40)		(.44)	
City (Pct)	−1.38		−1.37		−1.58	
	(.43)		(.45)		(.55)	
Home (Drop)		−.23		−.27		−.35
		(.09)		(.10)		(.12)
City (Drop)		.14		.16		.07
		(.09)		(.10)		(.12)
Observations	132	132	107	107	78	78
R^2	.18	.14	.21	.18	.23	.21
Adjusted R^2	.09	.06	.11	.08	.09	.06

To begin, Models 1 and 2 look at homeowners who want city housing prices to decrease. For these homeowners, a 10% increase in personal home value is linked to an 11 point increase in support for the new housing supply. This makes intuitive sense, as homeowners are more likely to support a proposal if they believe it will increase their home value. In contrast, looking at 'City (Pct)', a 10% increase in citywide prices is associated with a 14 point decrease in support. In other words, for those wanting lower housing prices, a belief that supply will increase city prices is detrimental to support. Another way to interpret this effect would be a 10% decrease in city prices is associated with a 14 point increase in voter support for the new supply. While the effect of city value is greater than home value, an F-test fails to reject the null hypothesis that the effects are the same size. Still, even with conservative assumptions, home prices and city prices have the same magnitude of effect on homeowner voting behavior.

To test whether a decrease in home value outweighs a decrease in city housing prices, Model 2 regresses support for new housing on dummy variables for a net decrease in prices. For the same sample of homeowners as Model 1, a drop in home prices is associated with a 23 point decrease in support, whereas a drop in citywide housing prices has a positive point estimate but the effect is not statistically significant. Within an F-test, these effects are not statistically different in magnitude, however the point estimate of the home effect is greater and the only statistically significant one.

As a robustness check, the same tests are conducted on samples of increasing 'conflict'. In Models 3 and 4, citywide percent point estimates are again of greater magnitude than those for personal home value effects, but I cannot reject the null hypothesis of equivalency. Likewise, for the effect of prices dropping, the emphasis again switches, with homeowners more heavily weighting personal home value while a drop in city prices is not statistically significant. Finally, Models 5 and 6 are composed of the most 'conflicted' homeowners, those who want city prices to decrease and home value to increase. Here, city housing prices again are at least equally linked to vote choice in comparison to personal home values. And again, the model flips when considering price drops, with a decrease in home value linked to 35 point decrease in support whereas declining citywide prices have no statistical effect on vote choice. Unlike previous samples, Model 6 shows a statistical difference between the two price effects using an F-test.

4.3 San Francisco Experiment

To assess the stability of these effects, I conduct the same analysis on data from the San Francisco exit poll. I not only asked voters about a 10% increase in supply, but I randomly varied whether that new supply would consist of affordable, luxury, or unspecified units. To measure the effect of housing price point on homeowner trade-offs, I conduct the same percent change versus price drop tests on all three conditions.[11]

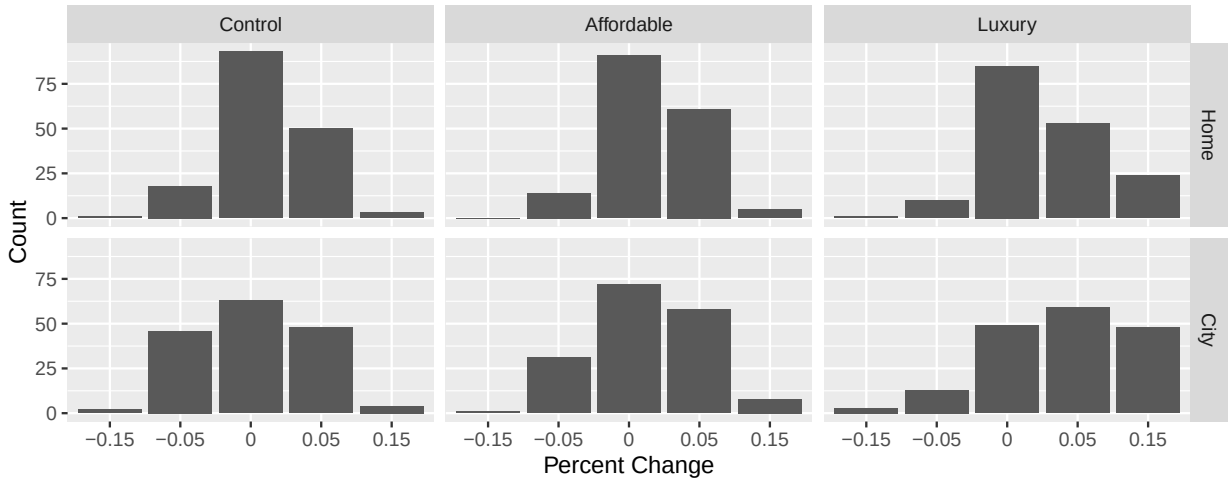

Figure 5: Expected price effects of each type of housing supply on home values (top) and citywide housing prices (bottom), San Francisco sample.

Models in Table 7 are paired by sample, with odd numbered models showing the effects of percentage changes in price and even numbered models showing the effects of a drop in prices. Moving across the table, Models 1 and 2 show these effects for those receiving the control condition, while Models 3 and 4 display the affordable treatment and Models 5 and 6, the luxury treatment.

For the control condition, a similar relationship emerges as in the national sample. In Model 1, an increase in home value suggests a positive effect but one that is not statistically significant, whereas a 10% increase in citywide housing prices is linked to a 19 point decrease in support for the supply proposal. Comparing the two, the point estimate for city prices is larger in magnitude, but a F-test does not reject equivalency. In contrast, Model 2 shows the effect of a drop in prices. Here, a decrease in home value is linked to a 36 point drop in support, whereas a decreases in city prices is only associated with a 16 point increase in support. Corroborating the national sample, the effect of home value decline is greater than citywide decline, and a F-test rejects equivalency. In other words, city price changes hold their own in the percent change model, but homeowners vote with their pocketbooks when facing losses.

While the San Francisco control condition reflects national trends, the relationships vary by

[11] Because of limited sample size, I cannot subset directly to conflicted homeowners, as doing so limits the same to around 40 respondents. Consequently, I include controls for interest in city and personal housing prices. Furthermore, for the affordable and luxury treatments where around 70 respondents want lower city prices, the effects of subsetting versus using interest controls leaves the coefficients of interest substantively unchanged.

Table 2: Price Effects on Support for Housing, San Francisco Sample

	Control	Control	Affordable	Affordable	Luxury	Luxury
	(1)	(2)	(3)	(4)	(5)	(6)
Home (Pct)	1.10		3.39		.75	
	(1.36)		(1.24)		(.57)	
City (Pct)	−1.90		−2.53		−1.84	
	(.99)		(.78)		(.51)	
Home (Drop)		−.36		−.42		−.28
		(.16)		(.15)		(.16)
City (Drop)		.16		.10		.47
		(.08)		(.05)		(.17)
Observations	86	86	109	109	107	107
R^2	.09	.13	.29	.30	.24	.25
Adjusted R^2	-.03	.01	.22	.23	.16	.18

price point. For affordable housing, in Models 3 and 4, the effects of new housing on personal home value are consistently greater in magnitude than those of city housing prices. Meanwhile, for luxury housing in Models 5 and 6, the effects on personal home value are consistently weaker than those of citywide housing prices. This contrast in how homeowners weigh their own home value against city prices suggests that the type of housing affects homeowner decision making.

As discussed in the Theory section, these variations by housing type may come from the sequence by which homeowners weigh the effects of new supply. For affordable housing, racial and economic connotations are powerful motivators. When presented with the proposal for more affordable housing, homeowners may feel a personal threat to their home value independent of citywide market forces, causing them to more heavily weight their own home value. On the other hand, luxury housing comes with fewer negative externalities. In this sense, the most likely way luxury housing would the lower a respondent's home value is if there is enough new supply to lower city prices overall. Because one's home value is not personally threatened by luxury housing, the homeowner will weigh citywide housing prices more heavily in evaluating support.

4.4 Behavioral Outcome

As a behavioral outcome, I use vote choice on Proposition I among voters living in the Mission District, the area directly affected by the proposal. Again, percent change is used, then dichotomized to a dummy variable to measure the effect of a net decrease in price.

Figure 6 shows the expected change in housing prices based on Proposition I, with most homeowners expecting an increase in prices from the proposition. Using this data, Table 3 displays four models. Models 1 and 2 show the effects of percentage change in prices, with Model 1 only using expected price changes and Model 2 using demographic controls for income, ideology, ethnicity, age, and gender. As seen in both Models 1 and 2, the positive effects of home value appreciation are substantial but statistically noisy, with a 10% increase in home value associated with a 24 point increase in support in Model 2. In contrast, the effect of price change in the Mission is more strongly linked to vote choice, with an expected 10% increase in Mission housing prices tied to a 44 percent decrease in support. A F-test rejects the null of equivalency at p¡.10.

When looking at price drops in Models 3 and 4, home value again eclipses public interest. A decreases in personal home value is associated with a 53 point decrease in support for Proposition

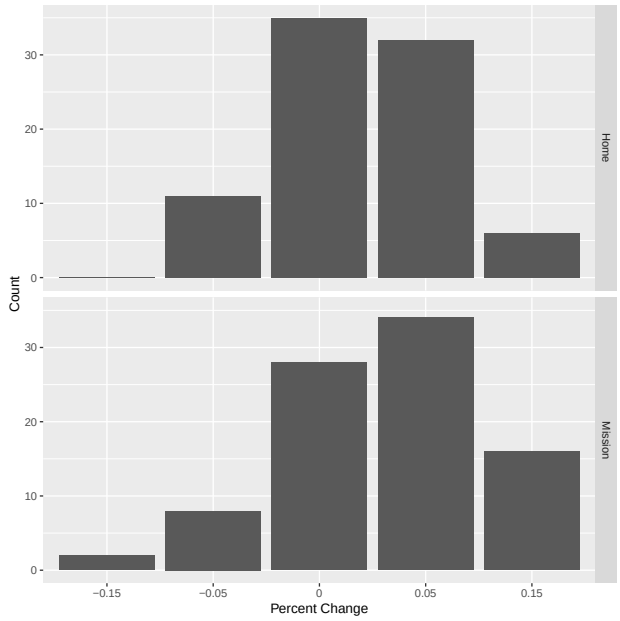

Figure 6: Expected change in home value (top) and Mission District prices (bottom) from Proposition I, Mission District sample.

Table 3: Price Effects on Support for Housing, Mission District Sample

	Simple	Controls	Simple	Controls
	(1)	(2)	(3)	(4)
Home (Pct)	1.42	2.43		
	(.82)	(.97)		
Mission (Pct)	−3.00	−4.36		
	(.96)	(1.15)		
Home (Drop)			−.53	−.10
			(.20)	(.26)
Mission (Drop)			.31	.19
			(.17)	(.17)
Observations	81	75	81	76
R^2	.09	.30	.05	.24
Adjusted R^2	.06	.19	.02	.13

I. Meanwhile, a decrease in Mission housing prices is only linked to a 31 point increase in support. However, these effects grow noisy within the fully controlled model. Still, the behavioral model largely matches the attitudinal models. Sociotropic motivations either win or at least hold their own when considering a percent change in housing prices, but pocketbook motivations drive homeowner vote choice when threatened with a loss in home value.

5 Discussion and Conclusion

While these effects are consistent across multiple datasets, future research should strive to uncover actual changes in housing prices rather than expected changes. An ideal test would consist of measuring the effects of new supply on actual home value, then assessing whether homeowners who experienced a loss in home value displayed less support for future supply increases, in comparison to homeowners unaffected by the new supply. Another way to further stress these results would be to attempt to experimentally vary the expected price effects by offering survey respondents 'official estimates' from a non-biased report. However, such treatments require buy-in from respondents, a belief that the official estimate is accurate and not an obvious experimental manipulation.

From a policy innovation perspective, these findings return attention to the idea of providing homeowners with a mechanism to insure their home value against loss from new development (Fischel, 2001). But not only do these findings support this policy, but they suggest that more emphasis needs to be placed on preventing home value loss than considering foregone home appreciation. One possibility is for cities to provide this insurance mechanism, but only in exchange for supporting an increase in local density.

In a broader sense, these findings conceptually advance our understanding of sociotropic voting behavior by being the first to incorporate the competing domains of gains and losses. Uniting these theories, losses outweigh gains, shifting the balance between self-interest and public interest in public policy support. So while homeowners are not value maximizers, they are value protectors. When considering the housing supply shortage, this finding may be a positive outcome. While local political economy models have discounted homeowner support for new supply, these findings suggest that homeowners can be a well organized political ally in lowering citywide prices. Or, at least an ally so long as the personal effects of that new supply remain in the domain of foregone gains.

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A Descriptive Statistics

Table 4: Descriptive Statistics, National Sample

Statistic	N	Mean	St. Dev.	Min	Max
Homeownership (pct)	3,019	0.7	0.5	0	1
Ideology	3,013	4.2	1.5	1	7
Income	2,965	76,370.1	52,806.3	3,500	200,000
White, non-Hispanic (pct)	3,019	0.6	0.5	0	1

Table 5: Descriptive Statistics, San Francisco Sample

Statistic	N	Mean	St. Dev.	Min	Max
Homeownership (pct)	1,660	0.4	0.5	0	1
Ideology	1,542	5.4	1.2	1.0	7.0
Income	1,495	3.7	1.5	1	6
White, non-Hispanic (pct)	1,660	0.6	0.5	0	1

B Proposition I Wording

Proposition I: Shall the City suspend the issuance of permits on certain types of housing and business development projects in the Mission District for at least 18 months; and develop a Neighborhood Stabilization Plan for the Mission District by January 31, 2017?

C Models with Full Controls

Table 6: Price Effects on Support for Housing, National Sample

	City Low		City Low/Home >=		City </Home >	
	(1)	(2)	(3)	(4)	(5)	(6)
Home (Pct)	1.07		1.04		1.41	
	(.38)		(.40)		(.44)	
City (Pct)	−1.38		−1.37		−1.58	
	(.43)		(.45)		(.55)	
Home (Drop)		−.23		−.27		−.35
		(.09)		(.10)		(.12)
City (Drop)		.14		.16		.07
		(.09)		(.10)		(.12)
Income, Log	−.04	−.02	−.01	.01	−.003	.05
	(.09)	(.09)	(.10)	(.10)	(.12)	(.12)
White, non-Hispanic	−.02	−.02	−.01	−.03	.04	.04
	(.08)	(.08)	(.09)	(.09)	(.13)	(.12)
Age	−.001	−.002	−.001	−.001	−.0001	−.001
	(.002)	(.002)	(.003)	(.003)	(.003)	(.003)
High School	.25	.23	.33	.29	.34	.28
	(.13)	(.13)	(.15)	(.16)	(.18)	(.19)
Less than High School	−.06	−.01	−.05	−.004	−.12	−.04
	(.26)	(.24)	(.27)	(.26)	(.26)	(.24)
Some College	.01	.02	.08	.09	−.03	.02
	(.09)	(.10)	(.11)	(.11)	(.14)	(.13)
Ideology	.07	.08	.09	.09	.07	.06
	(.03)	(.03)	(.03)	(.03)	(.04)	(.04)
Male	.09	.12	.08	.11	.07	.10
	(.09)	(.09)	(.10)	(.10)	(.12)	(.12)
Home Value Index, Log	−.06	−.06	−.08	−.08	−.12	−.11
	(.07)	(.07)	(.07)	(.07)	(.08)	(.08)
Home Value Appreciation (5 yr)	1.42	1.24	1.15	1.02	1.44	.66
	(1.16)	(1.17)	(1.27)	(1.25)	(1.57)	(1.56)
Constant	.87	.93	.96	1.25	.96	.98
	(1.08)	(1.09)	(1.18)	(1.22)	(1.62)	(1.58)
Observations	132	132	107	107	78	78
R^2	.18	.14	.21	.18	.23	.21
Adjusted R^2	.09	.06	.11	.08	.09	.06

Table 7: Price Effects on Support for Housing, San Francisco

	Control	Control	Affordable	Affordable	Luxury	Luxury
	(1)	(2)	(3)	(4)	(5)	(6)
Home (Pct)	1.10		3.39		.75	
	(1.36)		(1.24)		(.57)	
City (Pct)	−1.90		−2.53		−1.84	
	(.99)		(.78)		(.51)	
Home (Drop)		−.36		−.42		−.28
		(.16)		(.15)		(.16)
City (Drop)		.16		.10		.47
		(.08)		(.05)		(.17)
Interest, City	−.50	−.62	−.39	−.37	−.70	−.63
	(.65)	(.66)	(.56)	(.55)	(.60)	(.61)
Interest, Home	.48	.40	.24	−.13	.02	−.13
	(.67)	(.67)	(.49)	(.53)	(.63)	(.67)
Income	.04	.05	−.03	−.04	.02	.03
	(.04)	(.04)	(.03)	(.03)	(.02)	(.02)
Ideology	.02	−.01	.16	.15	−.06	−.07
	(.04)	(.03)	(.03)	(.03)	(.03)	(.03)
White, Non-Hispanic	.07	.05	−.09	−.05	−.08	−.07
	(.11)	(.11)	(.08)	(.09)	(.09)	(.10)
Age	.003	.002	−.004	−.004	−.0003	−.001
	(.004)	(.004)	(.004)	(.004)	(.003)	(.003)
Male	−.04	−.07	−.02	.01	.12	.12
	(.10)	(.10)	(.07)	(.07)	(.06)	(.06)
Years in SF	−.002	−.003	.002	0.0000	−.002	−.001
	(.003)	(.003)	(.003)	(.003)	(.002)	(.002)
Constant	.33	.51	.28	.40	.46	.45
	(.37)	(.30)	(.29)	(.30)	(.20)	(.23)
Observations	86	86	109	109	107	107
R^2	.09	.13	.29	.30	.24	.25
Adjusted R^2	-.03	.01	.22	.23	.16	.18

D Survey Instrument, National Sample

This is an excerpt of the survey questions pertaining to this paper.

- Think about your best interest. Do you want your (home value/rent) to increase, decrease, or stay the same over the next five years? Assume that (INSERT CITY)s economy would stay the same.
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)

- Think about the best interest of (INSERT CITY). Would it be best for average housing prices in (INSERT CITY) to increase, decrease, or stay the same over the next five years? Assume that (INSERT CITY)s economy would stay the same.
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)

- From your ZIP code, you live in (INSERT CITY), which has (INSERT UNITS) housing units (homes and apartments).

  Imagine (INSERT CITY) lowers development restrictions, making it easier to build new housing units. As a result, (INSERT 10 PCT of UNIT) more units, with a similar mix of homes and apartments, will be built over the next five years,

- If (INSERT 10 PCT of UNIT) more units were built, what would happen to your (home value/rent) over the next five years?
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)

- What would happen to your (home value/rent) if restrictions were changed so that no new housing units were built over the next five years?
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)

- If (INSERT 10 PCT of UNIT) more units were built, what would happen to average housing prices in (INSERT CITY) over the next five years?
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)

- What would happen to average housing prices in (INSERT CITY) if restrictions were changed so that no new housing units were built over the next five years?
  - Increase (+15%)
  - Increase (+10%)
  - Increase (+5%)
  - Stay the same
  - Decrease (-5%)
  - Decrease (-10%)
  - Decrease (-15%)

- Would you support the lowering of development restrictions in (INSERT CITY) to allow the construction of (INSERT 10 PCT of UNITS) more housing units over the next five years?
  - Strongly Oppose
  - Oppose
  - Somewhat Oppose
  - Neutral/Uncertain
  - Somewhat Support
  - Support
  - Strongly Support

E Survey Instrument, San Francisco

This is an excerpt of the survey questions pertaining to this paper.

- Proposition I is an 18 month ban on building market rate housing in the Mission District. How did you vote on Prop I?
  - Yes, I voted in favor of Prop I.
  - No, I voted against Prop I.
  - Did not vote on Prop I.

- If a similar ban were proposed **for your neighborhood**, how would you vote?
  - Yes, I would vote in favor of a similar ban.
  - No, I would vote against a similar ban.
  - I am unsure of how I would vote.

- If there were a proposition to build 10% more housing in San Francisco (and all of that housing would be affordable/luxury), how would you vote on that proposition?
  - Yes, I would vote in favor of that proposition
  - No, I would vote against that proposition
  - I am unsure of how I would vote.

- If that proposition to building 10% more housing (,all affordable/luxury) passed, by next year, housing prices **in SF** would...?
  Randomize use of phrases "rent", "home values", and "housing prices in SF" across questions.
  - Increase a lot (+15%)
  - Increase some (+5%)
  - Stay the same

  - Decrease some (-5%)
  - Decrease a lot (-15%)

  5-point scale will be displayed left to right with "Decrease" options to the left and "Increase" options to the right.

- If that proposition to building 10% more housing (,all affordable/luxury) passed, by next year, (**your** home value/**your** rent) would...?
  Randomize use of phrases "rent", "home values", and "housing prices in SF" across questions.
  5-point price scale.

- Thinking about **your** best interest, you want **your** [rent/home value] to...?
  5-point price scale.

- Thinking about the best interest **San Francisco is a whole**, by next year, housing prices **citywide** need to...?
  5-point price scale.