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The Higher Cost of Rental Housing

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Abstract

Rental and owner-occupied housing constitute distinct submarkets, with different costs and considerations for families. When comparing observably similar housing units in the two submarkets, how expensive is rental housing relative to owner-occupied housing? This comparison matters both to families and to policymakers, who must decide how to allocate limited funding for affordable housing programs. We apply matching techniques to American Housing Survey data from 2017 and 2021, finding that rental units tend to be more expensive than physically similar owner-occupied units. Accounting for the portion of mortgage payments that constitutes savings, renters in the Minneapolis-St. Paul region pay at least an extra $143 per month, or 9.4 percent of their housing costs. Among the metro areas contained in our data, the Twin Cities feature a rental premium towards the lower end of the range.

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Introduction

How much more or less expensive is it to get housing via renting than via owning a home?

Not everyone has a choice between renting and buying a house. For some, homeownership is financially out of reach; for others, rental housing may be scarce or entirely unavailable. But many Americans are confronted with difficult choices between renting and owning. Each presents its own set of risks, financial and otherwise. Renting exposes families to rising housing costs and means missing out on a key tax-advantaged investment opportunity.[1] Owning necessitates substantial upfront expenses, access to mortgage credit, and unpredictable maintenance outlays, in addition to the loss of flexibility in subsequent housing choice that a purchase can entail.

Each family will have unique considerations that affect this choice. But one of the most important and relevant considerations is usually opaque: Is it cheaper to get (comparable) housing by renting or buying? This is surprisingly difficult to calculate, though attempts have been made over many years (Shelton (1968)), often in order to assess whether a given housing market is characterized by an asset bubble (Himmelberg et al. (2005)).

We begin by considering the amount a renter must pay to a landlord. What is the equivalent payment for an owner-occupier? Their monthly cost includes taxes, property insurance, and maintenance, none of which are typically directly incurred by renters. The bulk of owner-occupier payments are for loan interest and repayment of principal, which together constitute a mixture of savings and payment for housing services. To make matters more complicated, differences in the quality of rental and owner-occupied properties mean that one cannot simply compare the average properties in each category. Rather, one must compare properties with similar characteristics (e.g., number of rooms, square footage, and so forth).

The contribution of this paper is to make quality-adjusted, apples-to-apples comparisons between monthly costs in the renter and owner-occupied segments of the market. These comparisons are useful in and of themselves for families—we want to better understand the housing choices confronting residents of the Minneapolis-St. Paul area, among other metropolitan areas. In addition to their relevance for household welfare, the comparisons are valuable for understanding how housing markets function.

As mentioned above, rental and owner-occupied units do tend to be quite different on average. We therefore use matching techniques to focus on comparisons between observably similar housing units. We apply these techniques to data from the 2017 and 2021 waves of the American Housing Survey (AHS), which contain rich information on housing-unit characteristics that make our matching approach more credible.

We find that monthly cash payments for renters and owner-occupiers—living in comparable Twin Cities area housing—are quite similar. However, this comparison ignores the substantial component of owners' payments that constitute savings. Partially offsetting this is the opportunity cost for an owner of their mortgage down payment, which could have been invested in other assets that generate returns, and which renters are not required to incur.

To adjust for these important factors, we calculate—for each mortgage in our data—an equiv-

[1] Lower-income Americans are unlikely to itemize deductions on their tax returns, which means forgoing the mortgage interest deduction. However, all owner-occupiers benefit from the non-taxation of the "imputed rent" that they pay themselves in their capacity as "landlords." The fact that landlords must pay tax on the rental income they receive tends to make renting a more expensive arrangement, all else equal.

alent hypothetical mortgage with no principal payments and no down payment.[2] This is a mortgage that, counterfactually, an owner could have incurred at the same interest rate we observe for their actual loan. This notional loan implies a monthly payment that entails no savings and no opportunity cost of a down payment.

Making this adjustment, we observe higher costs for renters—what we term a "rental premium." This premium is $143 per month in our matched sample, which amounts to 9.4 percent of renters' housing costs and 2.2 percent of renters' average income. We also examine the rental premium for lower-income families—those earning 80 percent or less of the area median income—and find that the premium is $128, amounting to 9.5 percent of renters' housing costs and 3.8 percent of renters' average income, but the estimate is not statistically significant in this smaller subsample.[3]

Having found that renting is generally more expensive than owning a home in the Twin Cities area, we then expand our analysis to metro areas throughout the country. We examine nine Metropolitan Statistical Areas (MSAs) that are included in the 2017 and 2021 AHS samples and compare their rental premiums with that of the Twin Cities area. The Twin Cities area has a rental premium moderately lower than in most of the other MSAs.

The focus of this paper is on documenting rental premiums. In subsequent papers, we and our colleagues will explore how rental premiums affect the optimal mix of housing policies at the state and local level. As policymakers seek to make housing more affordable for lower-income families, where can the most good be done at the smallest cost? Understanding the relative price of housing in the rental and owner-occupied segments of the market is key to delivering effective policy.

The relative cost of rental housing

Why might comparable rental and owner-occupied housing have different prices? On the one hand, household optimization behavior should bring housing costs into alignment: some renters will become owner-occupiers if the rental premium is high, and some owner-occupiers will become renters if the rental premium is low. This "arbitrage" would tend to keep prices close to each other in the two segments of the market.

On the other hand, households would need to be sufficiently responsive to price differentials in order to keep the rental premium small. This might not be the case if household preferences for housing type are very heterogenous, if access to credit is insufficient, or if information about price differentials is limited. This last point may be especially important when deciding to rent or own, given the uncertainty about the various costs of each.

On the supply side, higher returns in the rental (or owner-occupied) sector also tend to spur responses that help equilibrate the two sectors. However, it can be difficult (or impossible, as a matter of law) to convert housing stock back and forth from one segment to the other. There may also be persistent differences in the costs of providing rental and owner-occupied housing; for example, search frictions make it difficult to immediately fill a rental vacancy.

All of the above assumes that we are successful in matching rental units with comparable owner-occupied units. If we are unsuccessful, then monthly housing costs could be systemati-

[2]Thank you to Erik Hembre for this suggestion

[3]One factor we do not adjust for is the savings that tax itemizers have from the mortgage interest deduction. This applies only to higher earners and will depend on other details of the taxpayer's financial situation.

cally different due not to the issues just described, but rather to unobserved differences in the quality of the housing stock. Indeed, some research interprets differences in rents and house prices (after adjustment for observable factors) as being caused by differences in unobserved unit characteristics (Halket et al. (2020)). However, it is difficult to distinguish between this interpretation and one that emphasizes imperfect linkages between the renter and owner-occupied submarkets.

In order to begin discussing the premium (over equivalent owner-occupied housing) paid by renters, we must specify the components of housing costs for renters and owner-occupiers. Our data contain many but not all of the relevant components. For renters, housing costs include the monthly payment of rent to a landlord, renter's insurance, and utility amount. For owner-occupiers, housing costs include principal repayment, interest payments, property tax, property insurance, maintenance expenses, utility amount, and homeowners association (HOA) amount, if applicable. Property tax, insurance, and maintenance amount are the reported annual expenses converted to the monthly amount, distributed equally across the 12 months. One factor we do not include is the transaction cost (including real estate agent commission, taxes, and other expenses) associated with buying or selling an owner-occupied house. While this cost is relatively small for those with long tenure in their homes, it can be substantial for families that move more frequently.

In the case of owners who refinance their mortgages, our data do not include sufficient information to estimate the initial purchase price or the price at the time of refinancing. Unfortunately, this necessitates that we omit refinances from the baseline sample.[4] This exclusion has the effect of biasing our rental premium downward, given that owners refinance their mortgages when doing so would reduce their costs. In other words, our baseline estimate of the rental premium should be thought of as a lower bound.

Importantly, in our baseline approach we do not attempt to calculate imputed rent for owner-occupiers. Conceptually, owner-occupiers have two roles: that of landlord and that of occupant. Imputed rent is the name for the implicit payment that the "occupant" makes to the "landlord." This concept is useful because it identifies the portion of monthly housing costs that are a payment for housing services as opposed to savings. However, it is very sensitive to interest rates (which determine the opportunity cost of holding the housing asset) as well as to expected housing price growth.[5]

In this analysis, we take the more straightforward approach of, first, comparing households' monthly cash payments (excluding those whose mortgages are paid off). Second, we calculate a notional interest-only loan for each borrower, which implies a monthly mortgage payment that we then substitute for the actual mortgage payment observed in the data. By contrast to an imputed rent strategy, either variant of our approach is far less sensitive to the expected path of interest rates or to assumptions about future housing price changes. For example, over the course of 2022, the rapid rise in longer-term interest rates would have doubled imputed rent.[6] This large increase—driven by the rising time value of money—would have occurred without the vast majority of owners seeing any change in their monthly payments. Moreover, cash flows are of intrinsic relevance for liquidity-constrained households and constitute an important object of

[4]Refinances are, however, included in the "imputed rent" alternative approach described in appendix B.

[5]In the simplest setting, imputed rent is equal to the interest rate multiplied by the current value of the house. This product is assumed to be the return that a household could have earned had it purchased a non-housing asset. A more sophisticated approach would also take into account the expected appreciation of the housing asset, which is part of the return to holding it.

[6]The 30-year fixed-rate mortgage average in the United States rose from 3.22 percent during the first week of 2022 to 6.42 percent during the last week of that year (FRED).

study in their own right, and not just as a proxy for imputed rent.

However, we recognize that principal repayment is importantly different than other components of monthly housing costs for owner-occupiers. Observed mortgage payments include substantial savings in the form of debt repayment, i.e., repayment of principal.[7] Partially offsetting this is the opportunity cost for an owner of their mortgage down payment, which could have been invested in other assets that generate returns, and which renters are not required to incur. Our preferred specification therefore replaces observed mortgage payments with counterfactual interest-only mortgage payments.[8] The choice *not* to focus on imputed rent (which depends on the current market price of housing) has a notable implication for interpretation of the results. Because we rely on purchase prices for owner-occupied homes, our results should be understood as reflecting the actual costs facing the population of owner-occupiers (in housing units that can be matched to similar rental units, and that have not been refinanced). To the extent that housing prices have risen or fallen since the time of purchase, however, the costs for that population may not be the same as the costs facing owner-occupiers who recently purchased their homes.

We therefore provide an alternative approach—described in appendix B—that implements a simple version of imputed rent. Specifically, we multiply an owner-occupier's estimated *current* market price as of the survey year (i.e., not the actual purchase price) by the average 30-year fixed-rate mortgage interest rate in the same year. This calculation omits important considerations like expected housing appreciation, but may be illuminating in conjunction with our baseline estimates.

Data

We focus largely (though not exclusively) on the Minneapolis-St. Paul MSA, which leads us to use the 2017 and 2021 waves of the American Housing Survey (AHS). The combined dataset of 2017 and 2021 samples adds up to 4,417 records for the Minneapolis-St. Paul MSA. (See Figure 1 for data-cleaning steps and their associated impacts on sample size.) After data cleaning, we ended up with 1,601 records, 881 of which are renter households. Notably, this includes the loss of 659 refinance observations. This sample is then used to derive our baseline estimates.

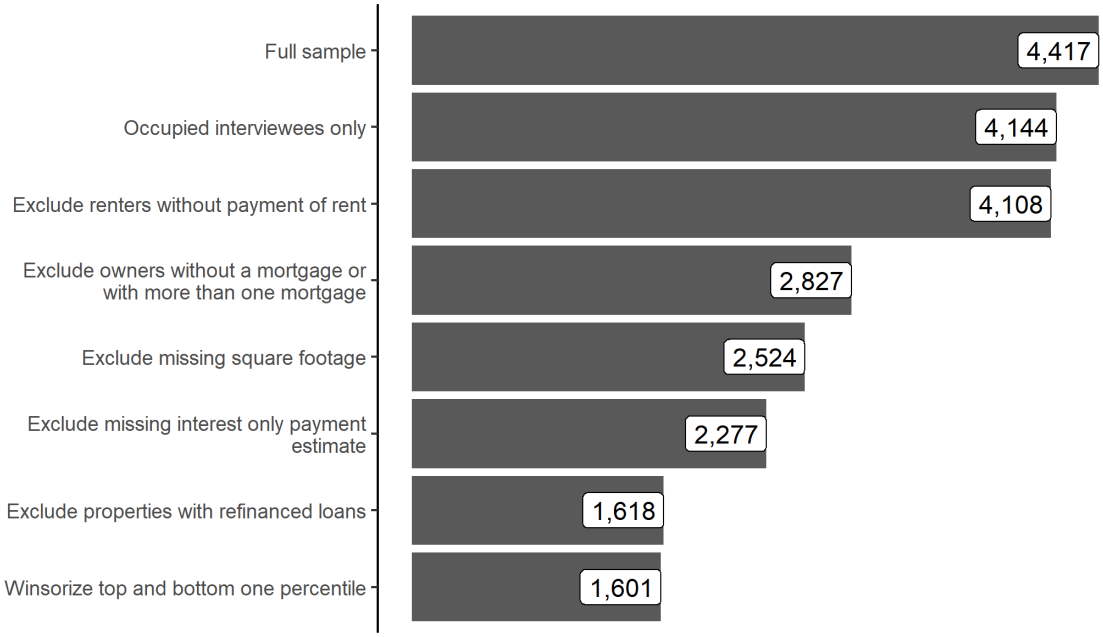
Separately, we also limit the sample to those households earning 80 percent or less of area median income. This allows us to explore the rental premium for low- and moderate-income (LMI) households specifically. In this sample, we retain 805 records, 606 of which are for renters.

The design of the AHS is such that records are housing units, the full sample of which is representative of MSA housing in a given year.

[7] These are "forced" savings under the term of a mortgage agreement, and families may sometimes view them similarly to interest payments, in that neither are available for current consumption. However, the ability to borrow against equity in a home and ultimately to sell a home make these savings importantly different than interest payments.

[8] An alternative to this method would have been to simply subtract the portion of mortgage payments allocated to principal repayment. A major downside of doing so is that it would imply systematically lower costs for high-tenure properties (those that are further along in their amortization schedules) than low-tenure properties. This would be a particular problem when comparing rental premiums across metropolitan areas. If one area has higher-tenure owner-occupiers than another, the first area would appear to have higher rental premiums simply because its owners were at the end of their amortization schedules. More generally, it would compound the problem of neglecting the opportunity cost of down payment—and then accumulated equity—in an owner's house.

Figure 1: Data-cleaning steps and their associated number of observations, Minneapolis-St. Paul MSA



We exclude records for which we were unable to estimate the interest-only payment among homeowners. The top and bottom one percentiles of total housing cost are excluded from the sample. Refinances, which make up about 48 percent of owner records, are excluded from the sample.

Methodology

The core of our approach to constructing a matched sample is one-to-one matching without replacement.[9] We prefer this approach to linear regression because our context is one in which misspecification is particularly likely. That is, we are not confident that it is possible to correctly characterize the precise functional relationship between particular housing unit characteristics and their desirability, and in turn their cost. Relatedly, the substantial differences in characteristics between most rental and owner-occupied units pose a danger of inappropriate extrapolation (in a linear-regression context). Our matching approach, by contrast, only makes comparisons between housing units that are observably very similar.

We began by implementing Mahalanobis distance matching on survey year, number of bedrooms, number of bathrooms, year the unit was built, finished square footage, and type of structure. (See Table 1.) This approach yielded 720 matched pairs (or 1,440 observations).[10] However, owner-occupied homes tended to have higher numbers of bedrooms, bathrooms, and higher square footage; we therefore regarded the sample as insufficiently balanced.

To achieve better balance across the renter and owner-occupied samples, we implemented exact cell matching on survey year and number of bedrooms, with Mahalanobis distance matching on number of bathrooms, year the unit was built, finished square footage, and type of structure. (See Table 2.) The requirement that pairs be precisely matched on survey year and bedroom

[9] We used the "MatchIt" R package to perform matching throughout this paper (Ho et al. (2011)). We did all data cleaning and analyses with R 4.2.0 (R Core Team (2022)).

[10] We apply equal weight to every record in the sample. Some of the observed variables are reported as ranges, from which we calculate the midpoints to be used in our matching and regression adjustments. See appendix C for more detail on how these variables are recoded.

number reduced our sample to 344 matched pairs (or 688 records in total).

Table 1: Housing characteristics of renters and owners in the matched sample based on nearest Mahalanobis distance only

	Owners	Renters	p-value
n	720	720	
Total housing cost (mean (SD))	1996.55 (1200.80)	1301.63 (709.47)	<0.001
Interest-only housing cost estimate (mean (SD))	1716.93 (871.88)	1301.63 (709.47)	<0.001
Structure type (%)			
1 unit, detached	591.0 (82.1)	124.0 (17.2)	
1 unit, attached	85.0 (11.8)	64.0 (8.9)	
2 units	7.0 (1.0)	41.0 (5.7)	
3-4 units	3.0 (0.4)	20.0 (2.8)	
5-9 units	7.0 (1.0)	36.0 (5.0)	
10-19 units	1.0 (0.1)	104.0 (14.4)	
20-49 units	4.0 (0.6)	127.0 (17.6)	
50+ units	16.0 (2.2)	201.0 (27.9)	
Mobile home or trailer	6.0 (0.8)	3.0 (0.4)	
Year built (mean (SD))	1976.44 (27.86)	1970.81 (28.83)	<0.001
Number of bedrooms (mean (SD))	3.29 (0.98)	1.87 (1.03)	<0.001
Number of bathrooms (mean (SD))	2.10 (0.67)	1.33 (0.53)	<0.001
Finished square footage (mean (SD))	2189.41 (942.17)	1099.65 (611.56)	<0.001
Survey year = 2021 (%)	330.0 (45.8)	266.0 (36.9)	0.001

Interest-only housing cost estimate assumes 100 percent loan-to-value ratio and interest-only payment for owner-occupied housing units.

Table 2: Housing characteristics between renters and owners in our full matched sample

	Owners	Renters	p-value
n	344	344	
Total housing cost (mean (SD))	1728.73 (1103.30)	1510.83 (753.01)	0.003
Interest-only housing cost estimate (mean (SD))	1471.56 (702.99)	1510.83 (753.01)	0.479
Structure type (%)			
1 unit, detached	222.0 (64.5)	130.0 (37.8)	
1 unit, attached	82.0 (23.8)	52.0 (15.1)	
2 units	7.0 (2.0)	25.0 (7.3)	
3-4 units	3.0 (0.9)	6.0 (1.7)	
5-9 units	7.0 (2.0)	20.0 (5.8)	
10-19 units	1.0 (0.3)	26.0 (7.6)	
20-49 units	4.0 (1.2)	30.0 (8.7)	
50+ units	16.0 (4.7)	52.0 (15.1)	
Mobile home or trailer	2.0 (0.6)	3.0 (0.9)	
Year built (mean (SD))	1971.91 (28.55)	1971.99 (29.67)	0.970
Number of bedrooms (mean (SD))	2.75 (0.93)	2.75 (0.93)	1.000
Number of bathrooms (mean (SD))	1.78 (0.61)	1.61 (0.63)	<0.001
Finished square footage (mean (SD))	1714.75 (691.00)	1445.13 (715.90)	<0.001
Survey year = 2021 (%)	166.0 (48.3)	166.0 (48.3)	1.000

Interest-only housing cost estimate assumes 100 percent loan-to-value ratio and interest-only payment for owner-occupied housing units.

Mahalanobis distance matching was implemented as follows. Given two vectors of housing

characteristics, $R, O \in \mathbb{R}^P$ where P is the number of covariates, the Mahalanobis distance for a given pair of observations is defined as:

$$d_M(R, O) = \sqrt{(R - O)^T S^{-1} (R - O)}$$

where $S^{-1} \in \mathbb{R}^{P \times P}$ is the inverse covariance matrix in the entire sample. S^{-1} implicitly "penalizes" differences in a given covariate less when the variance in that covariate is larger. This provides a scaling for differences in covariates—and a means of comparing across covariates—that depends not on their units but rather on how variable they are in the sample.

An owner-renter pair is then matched if they have the lowest Mahalanobis distance and have the same survey year and number of bedrooms. (Matching is without replacement, i.e., a given housing unit is only matched once.) To further improve the comparability of our two groups, we then use a follow-up procedure—regression adjustment—on the matched pairs.[11] In other words, we control for differences in year built, number of bathrooms, square footage, and type of structure in a linear regression that explains total housing cost in terms of renter (vs. owner-occupied) status. Because matching has already been conducted at this stage, the chance of important misspecification in the regression is reduced.

Formally,

$$\begin{aligned}\text{total housing cost}_i =& \beta_0 + \beta_R \times I(\text{renter}_i) + \beta_2 \times \text{year built}_i + \beta_3 \times \text{number of bathrooms}_i \\ &+ \beta_4 \times \text{square footage}_i + \beta_5 \times \text{type of housing unit}_i + \epsilon_i\end{aligned}$$

Our estimate of the rental premium is provided by β_R. We define total housing cost as the sum of the following components, where applicable: mortgage payment (or rent), utilities, property tax, insurance, HOA fees, and maintenance. As described above, the mortgage payment is, alternately, the observed total mortgage payment or the calculated interest-only mortgage payment.

To calculate the latter, we impute the purchase price using the mortgage amount (2021) or monthly mortgage payment (2017) along with down-payment percentages observed in the data. Down-payment percentage is reported as ranges, from which we calculate and use midpoints.

In 2017, only monthly mortgage payments are reported. Assuming a 30-year term on the mortgage and using the observed interest rate, we can calculate the purchase price for 2017 observations as follows:

$$r_i = \left(1 + \frac{\text{interest rate}_i}{12}\right)^{30 \times 12} - 1$$

$$\text{mortgage amount}_i = \frac{\text{monthly mortgage payment}_i}{\frac{\text{interest rate}_i}{12} \times \frac{(r_i + 1)}{r_i}}$$

Then we can estimate the purchase prices for both 2017 and 2021 as follows:

$$\text{purchase price}_i = \frac{\text{mortgage amount}_i}{1 - \text{down-payment percentage}_i}$$

Then the notional interest-only mortgage payment is:

$$\text{interest-only payment}_i = \text{purchase price}_i \times \frac{\text{interest rate}_i}{12}$$

[11] The "fixest" R package is used to do regression adjustments (Berge (2018)).

As with the simpler approach that focuses on total owner-occupier monthly costs, we add property tax, utility, insurance, HOA fees (if applicable), maintenance, and lot rent (if applicable) to the calculated interest-only payment in order to determine an owner-occupier's total monthly cost.

Results

Table 3 shows results from the regression above for both the full matched-pair sample and the LMI sample, i.e., those households that make 80 percent or less of the area median income (for the Minneapolis-St. Paul MSA, this was $79,900 in 2021 and $68,000 in 2017; U.S. Department of Housing and Urban Development). Even in the matched sample, square footage and number of bathrooms are significantly associated with the monthly total housing cost—suggesting that it was appropriate to control for those characteristics after matching.

Table 3 is based on our first approach of comparing rental payments with observed housing costs for owner-occupiers. Notably, observed costs include principal repayment. Examining either the full matched sample or the LMI subsample, point estimates are negative but statistically insignificant for the rental premium, i.e., the monthly housing cost of renters minus owners in the Minneapolis-St. Paul MSA. See Appendix Table A1 for the equivalent version of Table 3, but with a log transformation of the dependent variable that provides a percent of housing cost interpretation of the rental premium.

Table 3: Rental premium, reported mortgage payments

Dependent Variable:	Total housing cost	
	Full sample	LMI sample
Model:	(1)	(2)
Variables		
Is a renter	-116.1	-12.72
	(72.47)	(66.97)
Year built	-0.8173	-0.8536
	(1.424)	(1.308)
Number of bathrooms	391.0***	451.6***
	(68.75)	(68.72)
Finished square footage	0.2559***	0.0332
	(0.0617)	(0.0632)
Fixed-effects		
Structure type	Yes	Yes
Fit statistics		
Observations	688	334
R^2	0.17631	0.20767
Within R^2	0.13413	0.16797

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

For renters, reported total housing cost includes rent, renter's insurance, and utility. For owners, reported total housing cost includes principal repayment, interest payment, property tax, property insurance, maintenance expenses, utility, and homeowners association, if applicable.

However, as noted above, a large portion of monthly housing costs for owner-occupiers consists

of savings rather than payment for housing services. Both owner-occupiers and renters pay for housing services, but only owner-occupiers accumulate wealth as part of their monthly housing payments. (Note that we include maintenance and other costs that only owner-occupiers incur directly.)

For a fairer comparison, we now substitute our notional zero-down-payment mortgage for the observed mortgage. This makes a substantial difference to owner-occupier costs: among the 344 owners in our overall matched sample, average housing costs (inclusive of that payment) are $1,472, as compared to an average reported monthly total housing cost of $1,729.

Table 4 shows results for our preferred specification, inclusive of interest-only loan payments. Renters in the Twin Cities area pay $143 more per month than owners of a similar home. Among LMI households, the difference is $128 per month, but it is not statistically significant. As a percent of average total housing cost for renters, the premium is 9.4 percent in the full sample.[12]

Table 4: Rental premium, interest-only payments

Dependent Variable:	Interest-only housing cost estimate	
	Full sample	LMI sample
Model:	(1)	(2)
Variables		
Is a renter	142.5***	128.3
	(53.70)	(78.19)
Year built	-0.5150	0.8928
	(1.055)	(1.528)
Number of bathrooms	367.6***	362.3***
	(50.95)	(80.24)
Finished square footage	0.2270***	0.1164
	(0.0458)	(0.0738)
Fixed-effects		
Structure type	Yes	Yes
Fit statistics		
Observations	688	334
R^2	0.22995	0.14744
Within R^2	0.19596	0.12876

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Interest-only housing cost estimate assumes 100 percent loan-to-value ratio and interest-only payment for owner-occupied housing units.

While month-to-month cashflows are similar—and perhaps moderately lower for renters than for owner-occupiers—adjusting for owners' savings reveals a higher cost of renting. This rental premium is an underestimate of the true value, given that data limitations require us to omit owner-occupiers who refinanced their mortgage (which tends to secure a lower interest rate and thereby lowers owners' costs) prior to the survey year.

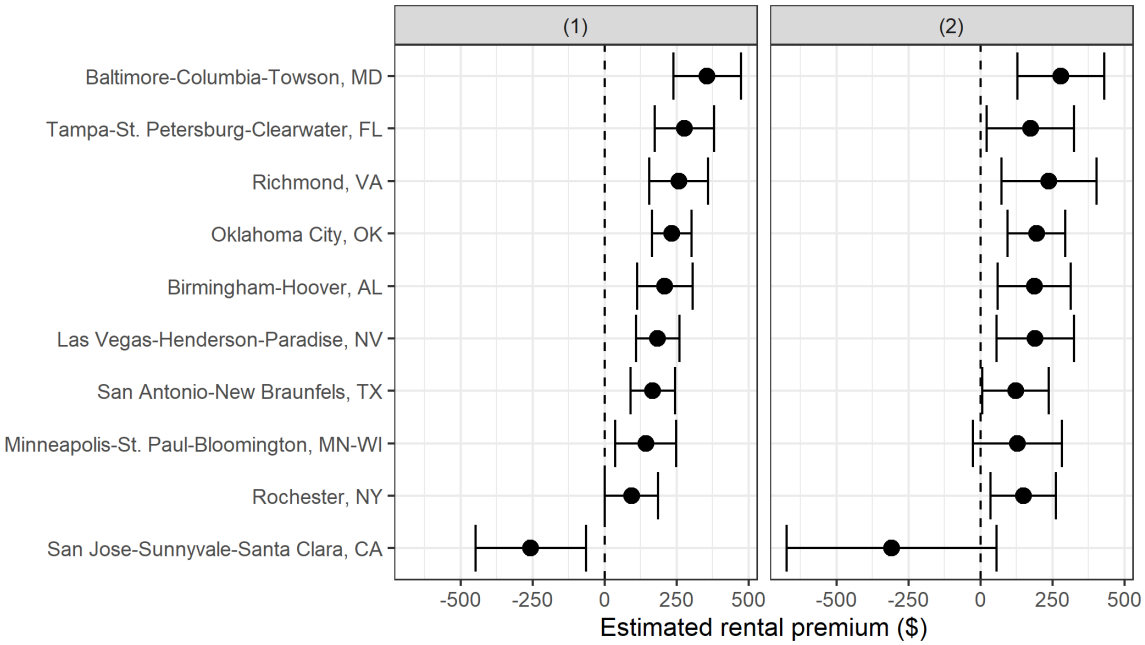
[12] As a percent of average renters' income, the rental premium is 2.2 percent for the full matched sample and 3.8 percent for the LMI matched sample.

Our preferred approach to calculating owner-occupiers' costs is not the only possible method. Rather than calculating a notional interest-only loan for each owner-occupier, we now calculate the opportunity cost of holding a housing asset (loosely speaking, the imputed rent). Results are shown in Appendix B. In principle, the estimated rental premium could be lower or higher than our preferred estimate, depending on how interest rates and housing prices evolved since mortgage origination. We find that the Twin Cities area rental premium, calculated with the alternative imputed rent approach, is larger ($202 for the full sample) than our preferred, lower-bound estimate ($143).

How Minneapolis-St. Paul compares to other MSAs

Having calculated rental premiums for the Minneapolis-St. Paul metro area, we now turn to the United States as a whole. For all but one of the ten metro areas that exist in both the 2017 and 2021 AHS waves, we find positive estimates of the rental premiums in our preferred specification, i.e., with observed mortgage payments replaced by counterfactual interest-only loan payments (Figure 2). The left panel shows results for the full matched sample, while the right panel shows results for the subset of that panel consisting of households with incomes below 80 percent of area median income.

Figure 2: How the Minneapolis-St. Paul MSA compares to other MSAs in terms of estimated rental premium



Model (1) includes all households, and model (2) limits the sample to LMI households only. Positive estimates indicate housing cost is higher among renters.

Rental premiums vary across MSAs, ranging from -$256 in San Jose-Sunnyvale-Santa Clara to $356 per month in Baltimore-Columbia-Towson in the full matched sample. Almost all surveyed MSAs featured positive rental premiums, with the Minneapolis-St. Paul MSA experiencing a smaller premium than most of the other MSAs.

For LMI households only, the pattern of rental premiums is quite similar. The estimated rental premiums are lower among LMI households for the majority of the MSAs, except for Las Vegas and Rochester where renters see higher premiums both in nominal dollars and as a share of their income. It is important to recall that our matching approach limits both samples

to housing units that have physically comparable units in the other sector (i.e., a rental unit must be matched with a similar owner-occupied unit). This requirement can make our samples unrepresentative of the larger population of all housing units, or all housing units inhabited by LMI households.

In Appendix B, comparable estimates can be found using the imputed rent approach to calculating rental premiums.

In future work, we hope to explore further the determinants of variation across MSAs in their rental premiums. One hypothesis (briefly discussed below) is that market participants expect different rates of housing price appreciation in different cities. For instance, if home buyers in San Jose expect sharply increasing prices, they will be willing to pay more in the present—relative to rents—to purchase a home, thereby lowering the rental premium. New home construction would ordinarily undermine this expectation, but regulatory and/or geographic limits on housing construction can prevent it from doing so.

Discussion

The premiums estimated in this article are of intrinsic interest, particularly to households confronting housing market choices. All else equal, rental housing was more expensive in our sample for households throughout the country. But the results may also have important implications for optimal public policy. In particular, when policymakers allocate scarce funds to making housing more affordable for lower-income residents, is it more cost-effective to subsidize rental or owner-occupied housing? Governments generally do both: for example, housing choice vouchers are used by families to secure rental units, and down-payment assistance is used to help families buy homes. The relative cost of rental housing matters for whether a dollar of public funds can purchase more housing in the owner-occupied or rental sectors. However, other details of housing subsidies—like the targeting and economic incidence of the programs—are relevant to this comparison and must be taken into account.

Moreover, the applicability and interpretation of our results depend on the economic context. When the 2017 and 2021 waves of the AHS were collected, borrowers had enjoyed a relatively long period of low mortgage interest rates. As of this writing in early 2023, mortgage interest rates are considerably higher. Even though this change has been partially offset (from a new borrower's monthly-cost perspective) by declining house prices in some markets, the combined impact has likely been to raise the relative cost of owning vs. renting for households considering a purchase (though not for the many borrowers who secured their financing prior to the increase in rates). The future paths of mortgage interest rates and house prices will both matter for how the rental premium evolves.

The questions addressed in this paper are adjacent to other questions and metrics that housing researchers have examined over the years. For example, authors have studied rent-to-value ratios in the housing market, motivated by a desire to reliably impute the flow of housing services in the owner-occupied sector (Heston and Nakamura (2009)), to assess the existence of housing market bubbles (Himmelberg et al. (2005)), or to devise accurate general-purpose models of the housing market (Epple et al. (2020)). A common finding among those who examine rent-to-value ratios is that they decline as the house price increases (Heston and Nakamura (2009)). Though this is not the approach taken in the current paper, it is broadly consistent with our finding that rental premiums are larger (in percent terms) for less-expensive housing. However, this pattern may be a result of selection: that is, owner-occupied homes with high prices are higher quality in ways not directly observed in available data (Halket et al. (2020)).

Another stylized fact about rent-to-value ratios is that, to the extent that they vary across cities, those differences tend to be persistent over time (Himmelberg et al. (2005)). Sinai and Souleles (2005) present evidence that this may be due to market participants' higher expected capital gains in cities with low rent-to-value ratios. Intuitively, owner-occupiers are willing to pay more relative to their rental option if they expect that home prices will rise in the future.

Conclusion

Nearly every family must participate in the market for housing, typically allocating a large share of its income to purchasing it. For families with low incomes, this is an especially difficult market to navigate. A variety of public programs therefore aim to make housing more accessible and affordable for everyone. An important part of the context for such efforts—and for family decisions about how to acquire housing—is the cost of rental housing relative to owner-occupied housing. When comparing rental and owner-occupied units that are as nearly comparable as possible with available 2017 and 2021 AHS data, we find that rental housing was more expensive in metro areas across the United States, including the Twin Cities area. Point estimates for rental premiums experienced by LMI households were similarly positive, though not statistically significant.

As economic conditions evolve, the method described in this paper can be used to track changes in the rental premium across time and space. Improvements in future data—in particular, information about the full price history of owner-occupied units—would allow calculation of tighter bounds on the rental premium. Looking to implications for policy, future work should also explore lessons these findings may have for the optimal deployment of affordable housing subsidies.

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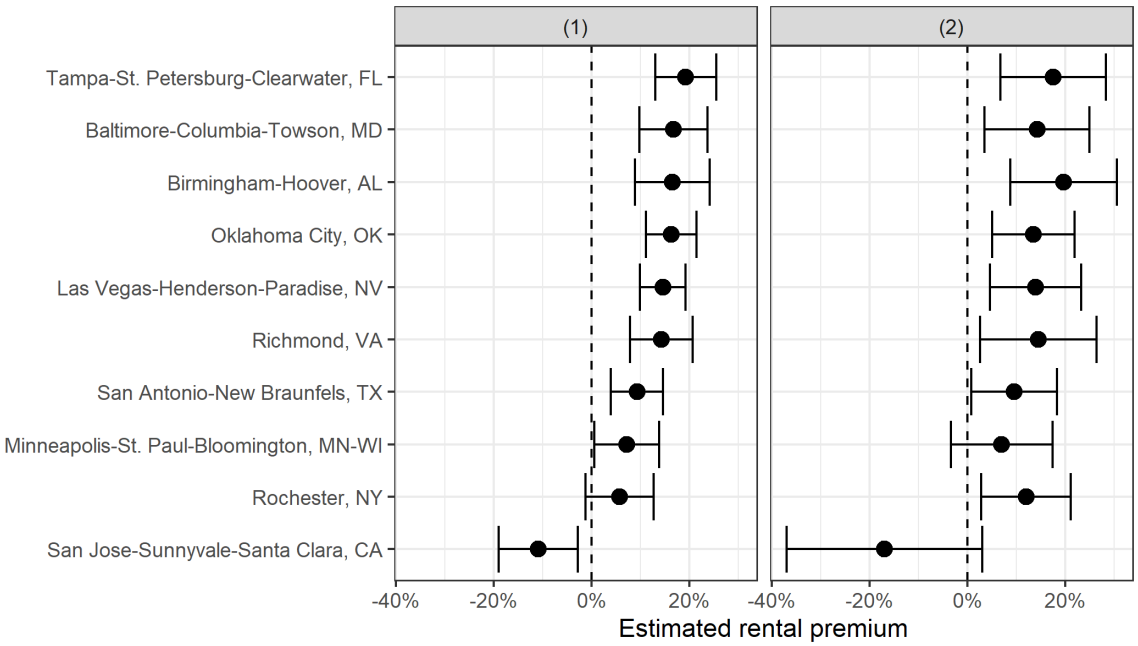
Appendix A

Table A1: Rental premium, natural log of reported mortgage payments and interest-only payments

Dependent Variables:	log(Total housing cost)		log(Interest-only housing cost estimate)	
	Full sample	LMI sample	Full sample	LMI sample
Model:	(1)	(2)	(3)	(4)
Variables				
Is a renter	-0.0853**	-0.0546	0.0721**	0.0702
	(0.0341)	(0.0505)	(0.0339)	(0.0528)
Year built	-0.0007	-0.0006	-0.0005	8.63×10^{-5}
	(0.0007)	(0.0010)	(0.0007)	(0.0010)
Number of bathrooms	0.2340***	0.2874***	0.2333***	0.2554***
	(0.0324)	(0.0518)	(0.0322)	(0.0542)
Finished square footage	0.0001***	3.46×10^{-5}	0.0001***	8.94×10^{-5}*
	(2.91×10^{-5})	(4.77×10^{-5})	(2.89×10^{-5})	(4.99×10^{-5})
Fixed-effects				
Structure type	Yes	Yes	Yes	Yes
Fit statistics				
Observations	688	334	688	334
R^2	0.24449	0.19255	0.22318	0.16272
Within R^2	0.17241	0.13587	0.17742	0.13276

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Figure A1: Rental premium across MSAs, natural log of interest-only payments



Model (1) includes all households, and model (2) limits the sample to LMI households only. Positive estimates indicate housing cost is higher among renters.

Appendix B

Outside of this appendix, the rental premium is calculated based on information about the initial purchase of a home: observed purchase price and interest rate. This approach is meant to capture actual payments made by owner-occupiers to secure their housing (after adjusting for variation in down-payment amount).

Here, we present estimates with a different conceptual basis. The estimates below reflect one assessment of the opportunity cost of holding a housing asset. That assessment is formed by multiplying the current market price of a house, as reported by the homeowner, and the current interest rate. (Both values are dated to the survey year rather than to the year of mortgage origination.) This quantity represents the opportunity cost of the housing asset: if a homeowner were to sell the house and deploy the savings in a riskless investment, the return would be identical to the "imputed rent" we calculate.

The alternative approach to calculating owner cost results in higher estimated rental premiums for both the full and the LMI samples. Renters face an average of $202 per month higher housing cost than their owner counterparts for similar homes, whereas LMI renters face an average of $190 per month higher cost. See Table B1.

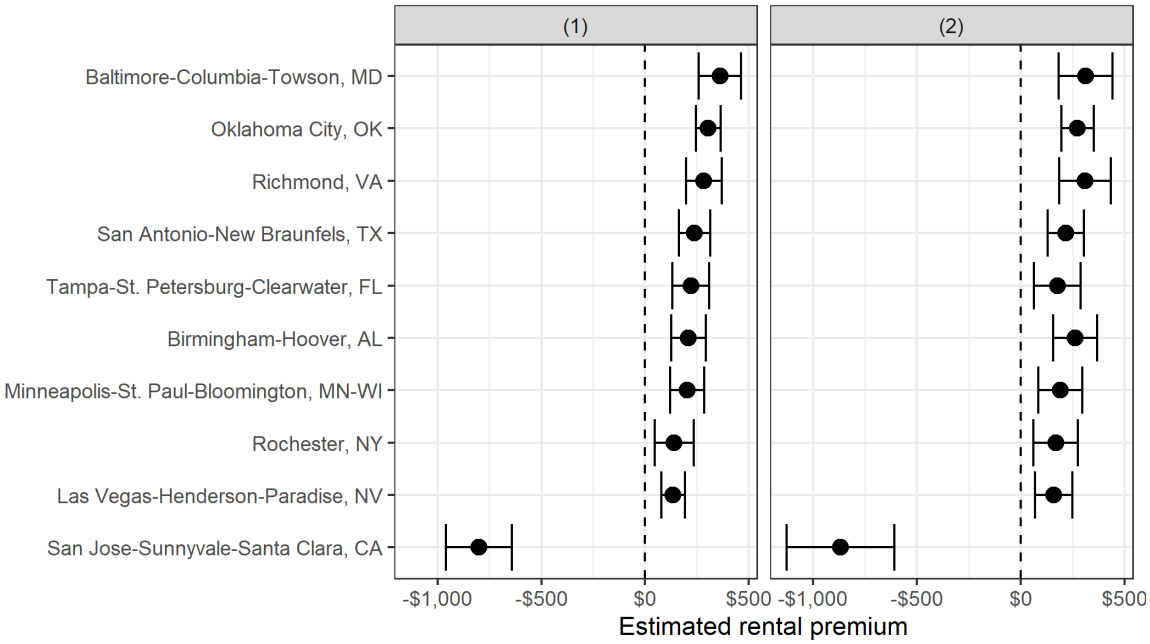
Looking at MSAs beyond Minneapolis-St. Paul, we observe similar patterns, with the imputed rent approach resulting in higher rental premiums.

Table B1: Rental premium, alternative imputed rent approach based on current market values and interest rates

Dependent Variable:	Interest-only housing cost estimate	
	Full sample	LMI sample
Model:	(1)	(2)
Variables		
Is a renter	202.2***	190.5***
	(41.83)	(53.69)
Year built	0.3054	2.362**
	(0.7633)	(1.003)
Number of bathrooms	386.9***	333.1***
	(39.42)	(53.40)
Finished square footage	0.2436***	0.0774
	(0.0355)	(0.0586)
Fixed-effects		
Structure type	Yes	Yes
Fit statistics		
Observations	996	474
R^2	0.28853	0.20753
Within R^2	0.25707	0.18227

IID standard-errors in parentheses
*Signif. Codes: ***: 0.01, **: 0.05, *: 0.1*

Figure B1: Rental premiums across MSAs, alternative imputed rent approach based on current market values and interest rates



Model (1) includes all households, and model (2) limits the sample to LMI households only. Positive estimates indicate housing cost is higher among renters.

Appendix C

Below we provide more detail about how we use specific variables in the analysis.

Square footage is reported as ranges in the AHS data. We converted these ranges to numerical values as follows:

Reported range	**Numerical representation**
Less than 500 square feet	500
500 to 749 square feet	625
750 to 999 square feet	875
1,000 to 1,499 square feet	1,250
1,500 to 1,999 square feet	1,750
2,000 to 2,499 square feet	2,250
2,500 to 2,999 square feet	2,750
3,000 to 3,999 square feet	3,500
4,000 square feet or more	4,500

Number of bathrooms is reported in our data as categories. We converted those categories to numerical values as follows:

Reported category	**Numerical representation**
No full bath: sink and tub present	0
No full bath: sink and toilet present	0
No full bath: tub and toilet present	0
No full bath: sink only	0
No full bath: tub only	0
No full bath: toilet only	0
No full bath: no sink, tub or toilet	0
One full bathroom	1
1.5 bathrooms	1.5
2 bathrooms	2
2.5 bathrooms	2.5
3 bathrooms	3
More than 3 bathrooms	3.5

Year unit was built is reported as ranges. We converted these ranges to numerical values as follows:

Reported range	Numerical representation
1919 or earlier	1915
1920 to 1929	1925
1930 to 1939	1935
1940 to 1949	1945
1950 to 1959	1955
1960 to 1969	1965
1970 to 1979	1975
1980 to 1989	1985
1990 to 1999	1995
2000 to 2009	2005
2010 to 2017 (2017 data only)	2014
2010 to 2019 (2021 data only)	2015
2020 to 2021 (2021 data only)	2020

Down payment percentage is reported as ranges. We converted these ranges to numerical values as follows:

Reported range	Numerical representation
0–2	1
3–5	4
6–10	8
11–15	13
16–20	18
21–40	30
41–99	70
100	100

Housing-unit types consist of mobile home or trailer; one-family house, detached; one-family house, attached; 2-unit buildings; 3- to 4-unit buildings; 5- to 9-unit buildings; 10- to 19-unit buildings; 20- to 49-unit buildings; 50-or-more-unit buildings; boat; RV; and van.