MIDDLEBURG COMMUNITIES

Surprising Result from 50 Years of Data

RENTING IS USUALLY A BETTER INVESTMENT THAN BUYING

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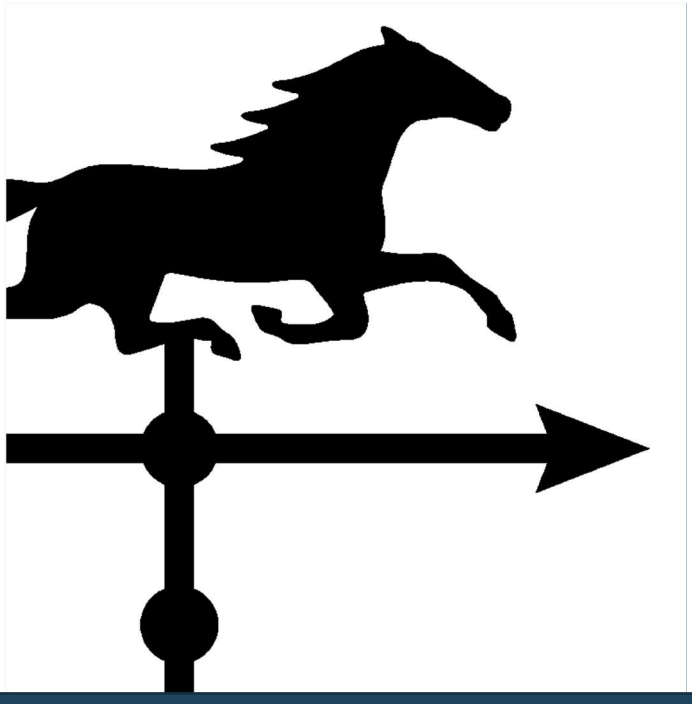

Renting is Usually a Better Investment than Buying

Americans have typically "learned" that buying a house is a good investment. It turns out that's not necessarily true. Choosing to rent frees up capital that can be invested for higher returns. Most of the past 50 years in the U.S. shows that renting, and investing the freed-up capital, has enabled greater wealth accumulation than buying a house.

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For most Americans, buying a house will be the single largest financial transaction they ever undertake. And most housebuyers will justify their purchase not merely as consumption—a place to live—but also as the most important financial investment they will ever make. As a financial investment, however, is housebuying really a good idea?

THE INVESTMENT CASE FOR BUYING A HOUSE

It is certainly natural to view a house not just as a consumption good (like other durable goods such as furniture) but as an investment asset. Just as with other investment assets such as stocks, house owners will be able to sell their assets in an active secondary market, with the sale price determined by market supply and demand.

For his groundbreaking study of asset price bubbles, *Irrational Exuberance*, Nobel prize-winning economist Robert Shiller constructed a history of house prices in the U.S. extending back to 1890, which suggests that house price appreciation has averaged 3.4% per year (just 0.7% per year after inflation).[1] Higher-quality data extending back to the early 1970s suggests that house price appreciation over the past 50 years has been slightly stronger, averaging about 5.4% per year (1.7% per year after inflation).

Those house price appreciation rates seem paltry relative to U.S. stock price appreciation averaging 5.1% per year for the longer time series or 7.6% per year over the past 50 years.[2] Stock price returns usually outpaced house price returns by an average of between 2.1% and 5.1% per year during historical periods lasting at least one year and failed to outpace house prices during just 13% of them.

As is often pointed out, however, house buyers almost always take out a mortgage to finance their purchase, making housebuying the only leveraged investment most Americans ever make. Equity returns on a

[1] Data and sources available at http://www.econ.yale.edu/~shiller/data.htm and updated using the S&P CoreLogic Case-Shiller Home Price Index.

[2] S&P 1500 Composite Index for the longer period from Shiller's web site; Wilshire 5000 for the last 50 years from Macrobond.

leveraged investment will be significantly higher than asset-level returns (provided asset-level returns exceed the interest rate on the debt), so the opportunity to leverage the investment is often given as the most significant benefit of purchasing a house.

On the other hand, house buyers face costs that renters do not. The most salient include:

- Repair and maintenance costs and property taxes, which are paid directly by housebuyers but not by renters (for whom both are included in their contract rent).
- The costs of various amenities such as swimming pools or exercise facilities that, like repairs and property taxes, are included in renters' contracts.
- Real estate agent commissions averaging 5.57% of the purchase price of the house.[3]

A final cost of housebuying that is often overlooked is the illiquidity of the investment. Most assets are traded in liquid exchanges that enable investors to respond quickly to changing market conditions, but houses are traded in an illiquid market that makes it impossible for investors to establish, liquidate, or adjust their holdings in any period less than several months. Careful academic research has shown that if the extreme illiquidity of housing is not taken into account, "estimated returns must be biased upward and risks downward.[4]

Moreover, the illiquidity constitutes a significant barrier to housing mobility, which also entails a significant barrier to job mobility. In short, owning a house may prevent the owner from moving to pursue better job opportunities, and may therefore reduce long-term wealth accumulation.

It is clear that the opportunity to leverage the investment suggests a strong investment case for buying a house, but equally clear that the case should not be analyzed simplistically.

MODELING THE INVESTMENT PERFORMANCE OF BUYING VERSUS RENTING

To set up a careful evaluation of the investment case for buying a house, we start by defining the alternatives:

Buy a house. For the purpose of this comparison,

- We assume the purchase of a house at the median sales price for new houses sold in the U.S., as

[3] Reported at https://www.fastexpert.com/blog/real-estate-agent-commissions-by-state/. Note that buyers or sellers who transact without the help of an agent must find another way to accomplish the same tasks—and generally are likely to be less efficient and therefore face a higher implicit cost.

[4] This very important finding is difficult to summarize briefly but has been researched carefully by Zhenguo Lin in a PhD dissertation, by Gianluca Marcato in a working paper, and in published research by Zhenguo Lin & Kerry Vandell; Ping Cheng, Zhenguo Lin & Yingchun Liu; and Shaun A. Bond & Steve L. Slezak, among others. The quotation is taken from Zhenguo Lin & Kerry D. Vandell, "Illiquidity and Pricing Biases in the Real Estate Market, *Real Estate Economics* 35(3):291-220, Fall 2007.

reported by the U.S. Census Bureau and U.S. Department of Housing and Urban Development in the monthly New Residential Sales report.

- We assume that the purchase requires a down payment of 20% and a 30-year fixed-rate mortgage with an interest rate equal to the (mid-month) average reported by Freddie Mac.
- We assume that the value of the property increases in accordance with the S&P CoreLogic Case-Shiller National House Price Index (not seasonally adjusted).[5]
- We assume that property taxes are paid monthly at 0.83% per year of the current value of the property.[6]
- We assume that the costs of repairs & maintenance depend on the age of the property, which is measured by the number of years since purchase given that we assume purchase of the median-priced new house.[7]
- We conduct our comparison over the 30-year maturity period for the initial mortgage, assuming no prepayment, curtailment, default, or other disruption.
- We assume that the equity in the house is reduced by the 5.77% real estate agent commission at the conclusion of the 30-year holding period.
- We track a monthly (nominal) income that remains constant in real terms and is exactly the amount required to pay for the maximum value over the 50-year time period of either rent or the mortgage payment plus repairs & maintenance plus property taxes.[8] This monthly income turns out to be $2,221 in September 2023.
- We assume that any monthly income in excess of the amount required to pay for repairs & maintenance plus property taxes is invested into a portfolio of U.S. stocks and bonds using low-cost index funds.[9]

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[5] As Shiller did, we use the home purchase component of the U.S. Consumer Price Index (PHCPI) for months before the January 1975 initial date of the Case-Shiller index.

[6] Reported at https://www.scotsmanguide.com/residential/property-tax-increases-put-pressure-on-homeownership/

[7] The cost is estimated at $0.0050905 + 0.0008114*age - 0.0000066*age^2$, a regression model estimated from data analyzed in *Commercial Buildings Capital Consumption and the United States National Accounts* by Sheharyar Bokhari and David M. Geltner. Note that the figures are based on professionally managed multifamily properties and therefore are likely to understate the costs paid by individual housebuyers. Note also that, as with real estate agent services, housebuyers can choose to do their own maintenance and repairs but must accomplish the same tasks or tolerate depreciation of the asset value.

[8] Clearly both the buyer of the median-priced new house and the renter of the median-priced rental unit will have income (or at least available income) greater than this. The income tracked in this analysis is meant only to enable the comparison between buying and renting, not to represent total income—and, of course, buyers and renters may elect to make exactly the same uses of their excess income.

[9] For stocks we use the Wilshire 5000 index, for which both price-only and total returns are available back to April 1971 through the FRED web site. For bonds, following Shiller's *Irrational Exuberance*, we use 10-year U.S. Treasury notes. We assume that investors pay 6 basis points in annual investment management expenses.

Rent a house or apartment. Our assumptions are intended to preserve comparability as closely as practicable:

- We assume rental of a unit at the median gross rent.[10] Contract rents are typically fixed for at least the first year, but we assume that rents move monthly in accordance with the Rent of Primary Residence component of the Consumer Price Index (not seasonally adjusted).
- We assume that the renter starts with exactly the same initial endowment as the owner but invests it. The initial endowment is equal to the down payment paid by a housebuyer, which (as noted) is 20% of the median sale price for new houses sold.
- Renters pay nothing for repair & maintenance or for property taxes (except implicitly through the rent).
- Renters earn the same monthly income as buyers.
- Both the initial endowment and any monthly income in excess of rent are invested, as with buyers, in the same stock/bond portfolio.

It is worth noting that both buyers and renters get to live in the dwelling for which they have paid, so there is no need to compute an "owner's equivalent rent" to compare with contract rent.

Comparison. We evaluate the buy/rent decision by computing the growth in wealth for a buyer and a renter making a one-time choice during every month starting in April 1971 (the inception date for the Freddie Mac mortgage interest rate series) through September 1993 (which enables the 30-year mortgage maturity period to be completed by September 2023). It is important to note that we are not comparing investment returns *per se*; rather, we are comparing the rate at which wealth grows from (1) owning a leveraged investment in a house and (2) investing the money not required to pay the costs of housing.

Two examples illustrate the comparison. In December 1972 the median sale price of a new house was $29,700 and the average interest rate on a 30-year fixed-rate mortgage was 7.43%. The initial endowment was $5,940 which for the buyer constituted the 20% down payment and for the renter was invested. In the first month (January 1973) both buyer and renter had income of $198.36. The buyer's monthly mortgage payment was $165.00, repairs were $12.74, and property taxes were $20.50, so the buyer spent $198.23 and invested the remaining $0.13. The median rent was $176.84 so the renter invested $21.52. To begin, we allocate the investment 69% to stocks and 31% to bonds. The total return during December 1972 on a 69/31 portfolio was 0.62%, so the renter

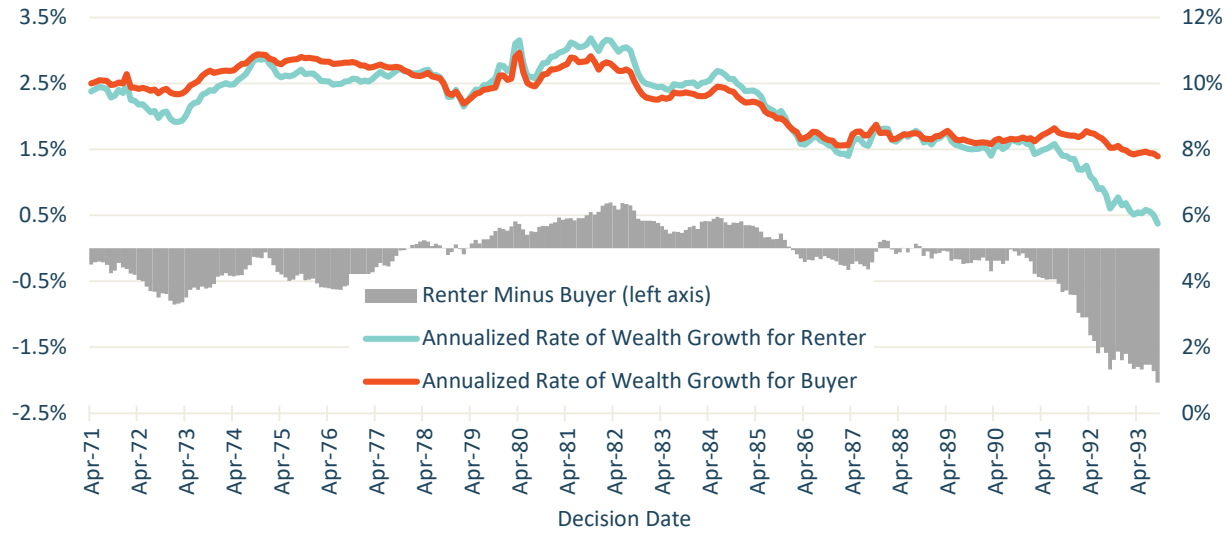
[10] Median gross rent is measured by the U.S. Census Bureau but is not available on a monthly basis. We use the median gross rent from the 2010 decennial census, and then adjust it to monthly values using the Rent of Primary Residence component of the Consumer Price Index as reported by the Bureau of Labor Statistics, assuming the 2010 census figure applies to June of that year.

earned $37.00 in investment returns ($5,940+$21.52 * 0.62%) and ended the month with wealth of $5,977.00. The buyer earned essentially no investment returns and the value of the house declined by $67.76, but the buyer's wealth declined by just $49.87 thanks to the $17.88 principal payment on the mortgage. When the mortgage matured in December 2002 the buyer's house (with no remaining debt, but after payment of the real estate brokerage commission) was worth $173,384.48 and the buyer's investment portfolio had grown to $166,770.16, so the buyer's total wealth had grown to $340,154.65 while the renter's investment portfolio had grown to $280,180.92. The annualized rate of growth of wealth was 14.44% per year for the buyer (9.75% per year after inflation) and 13.71% per year for the renter (9.01% per year after inflation), so the buyer's wealth increased at 0.74% per year more rapidly than the renter's wealth.

The second example begins in March 1982, when the median sale price of a new house was $67,200 and the average interest rate on a 30-year fixed-rate mortgage was 17.19%. The initial endowment was $13,440 which for the buyer constituted the 20% down payment and for the renter was invested. In the first month (April 1982) both buyer and renter had income of $850.43. The buyer's monthly mortgage payment was $774.74, repairs were $28.92, and property taxes were $46.54, so the buyer spent $850.20 and invested the remaining $0.23. The median rent was $319.34 so the renter invested $531.09. The total return during April 1982 on a 69/31 portfolio was 4.12%, so the renter earned $553.51 in investment returns ($13,440+$531.09 * 4.12%) and ended the month with wealth of $13,993.51. Again the buyer earned essentially no investment returns, but the value of the house increased by $86.64 and that plus the $4.63 principal payment on the mortgage caused the buyer's wealth to increase by $91.50. When the mortgage matured in March 2012 the buyer's house (with no remaining debt but after payment of the real estate brokerage commission) was worth $186,833.34 and the buyer's investment portfolio had grown to $516,564.81, so the buyer's total wealth had grown to $703,398.15 while the renter's investment portfolio had grown to $858,989.60. The annualized rate of growth of wealth was 14.10% per year for the buyer (10.63% per year after inflation) and 14.86% per year for the renter (11.39% per year after inflation), so the renter's wealth increased at 0.76% per year more rapidly than the buyer's wealth.

We conduct this comparison for 270 starting months—as noted, every starting month from April 1971 through September 1993. The results are shown in Chart 1A. For the most part, people who bought houses from April 1971 through August 1977 grew their wealth more rapidly than people who chose in the same months to be renters for the next 30 years. Conversely, renters enjoyed superior wealth accumulation over the next 8½ years from September 1977 through February 1986. The latter

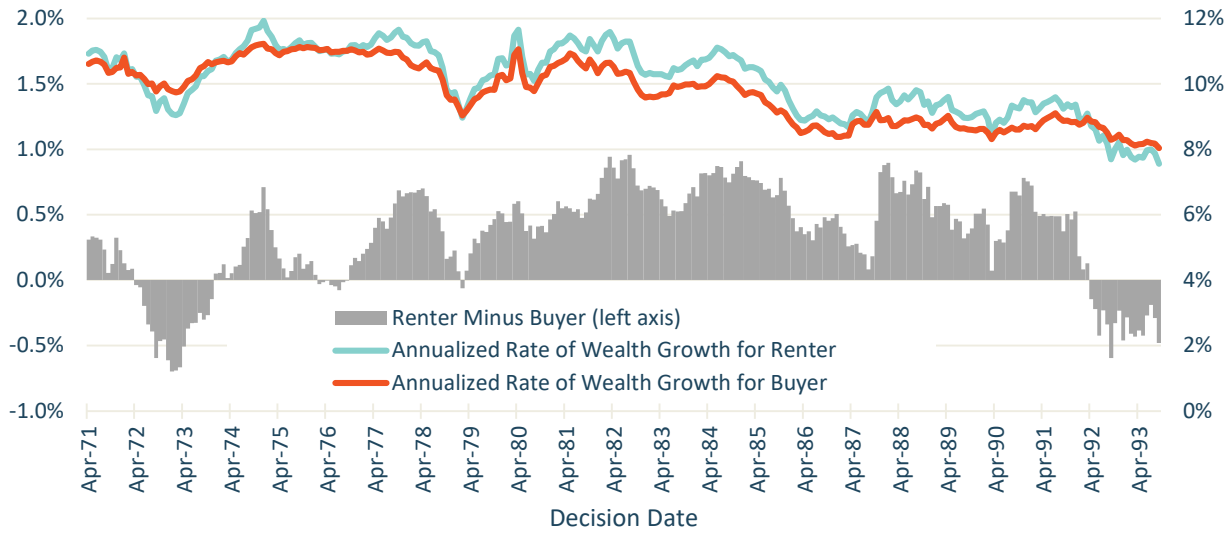
Chart 1A: Comparison of Real Returns on House Rent vs Buy Decision
69/31 Baseline Stock/Bond Allocation



part of the historical period, from February 1991 through September 1993, was a time during which buyers increasingly out-accumulated renters, corresponding with a period 30 years later (from February 2021 through September 2023) when both house prices and rents increased dramatically.

Across all 270 observable 30-year holding periods shown in Chart 1A, the annualized rate of wealth accumulation for both groups average 13.1% per year (9.5% per year after inflation), with a median of 13.1% for buyers and 13.5% for renters. The equality of the results for renters and buyers is a result of the

Chart 1B: Comparison of Real Returns on Home Rent vs Buy Decision
100% Stock Portfolio



initially chosen 69/31 portfolio allocation for the analysis shown in Chart 1A. Individuals who are comfortable allocating more than 69% of their portfolio to stocks—especially younger individuals, who generally should have a stock-heavy portfolio—are more likely to grow their wealth by continuing to rent rather than by sinking their investment capital into a down payment. Chart 1B shows exactly the same analysis as Chart 1A, but for a 100% stock portfolio. In this case, across all 270 observable 30-year holding periods the annualized rate of wealth accumulation for renters averages 13.7% per year (10.1% per year after inflation) compared with just 13.3% (9.7% after inflation) for buyers, and renters out-accumulated buyers during 223 of the 270 periods including every decision date for 15½ years from October 1976 through March 1992.

Chart 2 shows how the average annual rate of wealth accumulation differed for buyers and renters, over the available historical period, depending on the stock/bond allocation of the investment portfolio. In general, the more comfortable individuals are with investing in stocks, the more they should prefer renting because renting enables them to invest more in stocks. Conversely, people who prefer a lower stock allocation—but are still comfortable with the added investment risk entailed by using a mortgage—are more likely to prefer housebuying because they do not mind putting money into the down payment rather than into stocks.

PREDICTING WHETHER BUYING OR RENTING WILL DOMINATE

The relative outcomes of any buy/rent decision cannot be evaluated until the

Chart 2: Average Annual Rate of Wealth Accumulation by Stock/Bond Allocation

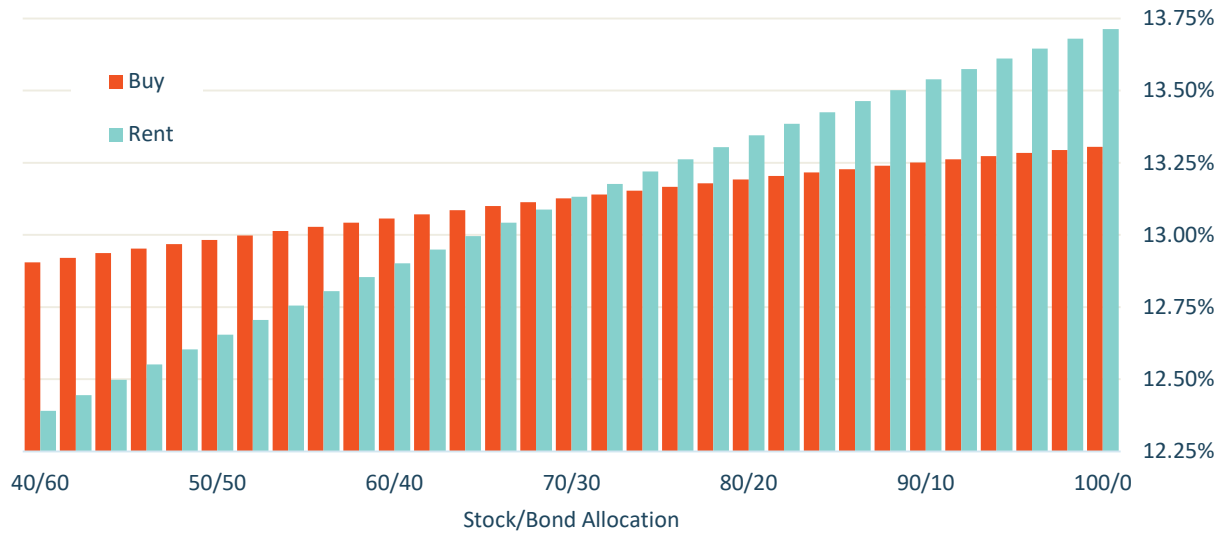


Chart 3: First-Time Housebuyer Affordability

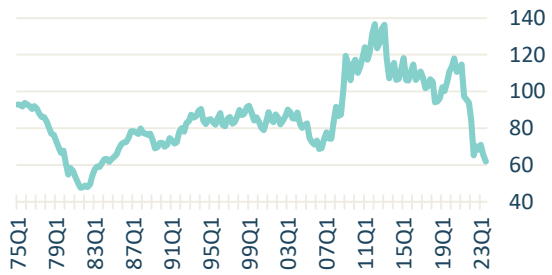
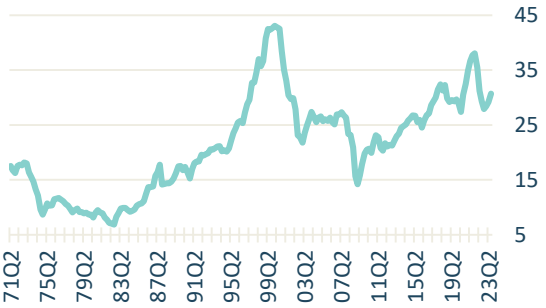


Chart 4: CAPE Ratio



completion of the 30-year mortgage maturity period, but it is worth asking whether they can be predicted at the time the initial decision is made.

It seems likely that housebuyers will be more likely to out-accumulate renters if initial decisions come at times when the cost of housebuying is relatively low, while renting will be more likely to out-accumulate housebuying when the cost of housebuying is relatively high. The first variable we include in our predictive model is the average rate on 30-year fixed-rate mortgages. We expect this variable to be positively related to renter out-accumulation (that is, the difference between the average annual rate of wealth accumulation for renting and the average rate for housebuying).

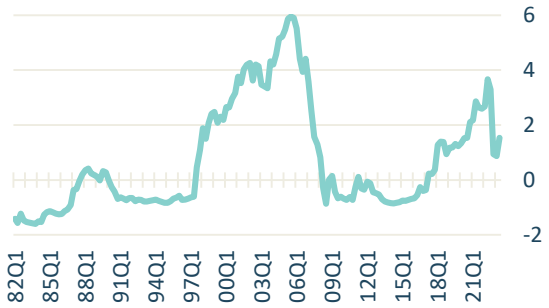
The mortgage interest rate, however, is only a partial contributor to the cost of housebuying: the price of houses is the other major contributor. The National Association of Realtors publishes a quarterly "first-time homebuyer affordability" statistic (Chart 3) based not only on the average interest rate but also on the median price of a "starter" house.[11] A value above 100 indicates that a typical first-time housebuyer earns more than 100% of the income necessary to qualify for a mortgage on the typical starter house. Therefore we expect the affordability index to be negatively related to renter out-accumulation.

Since the main benefit of renting relative to buying is that money not spent on buying—especially the down payment—can instead be invested, it seems likely that out-accumulation will be related to the likely performance of the stock market over the next 30 years. Although stock market returns are difficult to predict over relatively short periods, Shiller has shown that the cyclically adjusted price-to-earnings (CAPE) ratio[12] (Chart 4) has proven useful in predicting longer-term stock performance, with higher values of the CAPE ratio predicting lower future stock performance. Therefore we expect the CAPE ratio to be negatively related

[11] Available at https://www.nar.realtor/research-and-statistics/housing-statistics/housing-affordability-index.

[12] Available at http://www.econ.yale.edu/~shiller/data.htm.

Chart 5: Exuberance



to renter out-accumulation: that is, when the CAPE ratio is relatively low it is more likely that renters will out-accumulate buyers by investing more into a well-performing stock market.

The relative price of for-sale and for-rent housing is likely to be affected by fluctuations in relative demand, presumably affecting which tenure choice is likely to contribute most to wealth accumulation. As a very simple measure of relative demand we include the number of new single-family houses sold.[13]

The development of a bubble in house prices can be considered an extreme version of a discrepancy in demand and cost between housebuying and renting. As an indicator of possible bubble conditions, the Dallas Fed publishes an "exuberance" measure (Chart 5), developed in Pavlidis *et al.* [2016], which signals "periods of exuberance during which house prices display explosive behavior" that "may occur when house prices are not based on housing market fundamentals."[14]

Descriptive statistics for the regression variables are shown in Table 1. The exuberance indicator is computed at a quarterly frequency and is available starting in 1982Q1, so monthly data for the other variables are converted to quarterly averages and the regression analysis covers 1982Q1-1993Q3. Descriptive statistics for the explanatory variables are shown for the

Table 1: Descriptive Statistics

Variable	Period	Average	Standard Deviation	Minimum	Maximum
Rent Minus Buy	82Q1-93Q3	-0.03%	0.59%	-1.50%	0.73%
Mortgage Interest Rate	82Q1-93Q3	11.07%	2.42%	7.10%	17.43%
	93Q4-23Q3	5.61%	1.64%	2.77%	9.12%
Housebuyer Affordability	82Q1-93Q3	70.9	9.7	48.0	87.3
	93Q4-23Q3	95.0	17.1	61.9	136.7
Shiller CAPE Ratio	82Q1-93Q3	14.2	4.1	6.9	20.8
	93Q4-23Q3	27.5	6.1	14.2	43.1
New-House Sales (thousands)	82Q1-93Q3	618	95	364	791
	93Q4-23Q3	715	257	292	1,296
Exuberance Indicator	82Q1-93Q3	-0.74	0.63	-1.60	0.41
	93Q4-23Q3	1.32	2.03	-0.87	5.95

[13] We use the seasonally adjusted annual rate published as part of the New Residential Sales report.

[14] https://www.dallasfed.org/research/international/houseprice, linking to https://link.springer.com/article/10.1007/s11146-015-9531-2.

last three decades (1994Q4-2023Q3) for comparison.

It will be noted that housebuyer affordability was poor through the 47-quarter available historical period, generally because mortgage interest rates in the 7.10%-17.43% range were quite high by the standards of recent years. Housebuyer affordability remained below 100—that is, affordability continued to be poor—during most of the last three decades with the exception of 2008Q4-2018Q1 and 2019Q1-2021Q1, when extraordinarily low mortgage interest rates boosted housebuyer affordability.

Exuberance was quite muted during the historical period, typically negative and never exceeding 0.41. In contrast, from 1997Q3 through 2008Q1 it never dipped below 0.46 and peaked above 5.85 during 2005Q2-Q4. Similarly, the CAPE ratio was quite reasonable during the historical period, never exceeding 20.8. In contrast, during the last three decades it has never fallen below 20.8 except during 1994Q2-1995Q1, 2008Q4-2010Q3, and 2011Q3-2011Q4.

The results of regressing renter out-accumulation on contemporaneous values of the the explanatory variables are shown in Table 2. The adjusted R-squared of 0.889 indicates that the model fits the available historical observations quite well, suggesting that individuals can use contemporaneous data to predict whether owning or renting will turn out to have enabled greater wealth accumulation over the next 30 years.[15]

The mortgage interest rate and the NAR first-time housebuyer affordability

Table 2: Regression Results – Observed Rent minus Buy
69/31 Baseline Stock/Bond Allocation

regressor	coefficient	standard error	*t*-stat	*p*-value
Intercept	0.0563	0.0143	3.948	0.0003
Mortgage Interest Rate	-0.0956	0.0561	-1.705	0.096
Housebuyer Affordability	-0.000269	9.71E-05	-2.771	0.008
Shiller CAPE Ratio	-0.00163	0.0003	-5.837	7.37E-07
New-House Sales (thousands)	-7.42E-07	4.51E-06	-0.164	0.870
Exuberance Indicator	0.00455	0.0006	7.507	3.20E-09
Adj R^2 = 0.889 *F*-statistic = 74.6 N = 47				

[15] The same regression conducted for a 100% stock portfolio shows a lower adjusted R-squared of just 0.810; the first-time housebuyer affordability index is no longer statistically significant but sales volume has become statistically significant with a negative sign; other coefficients are not greatly different.

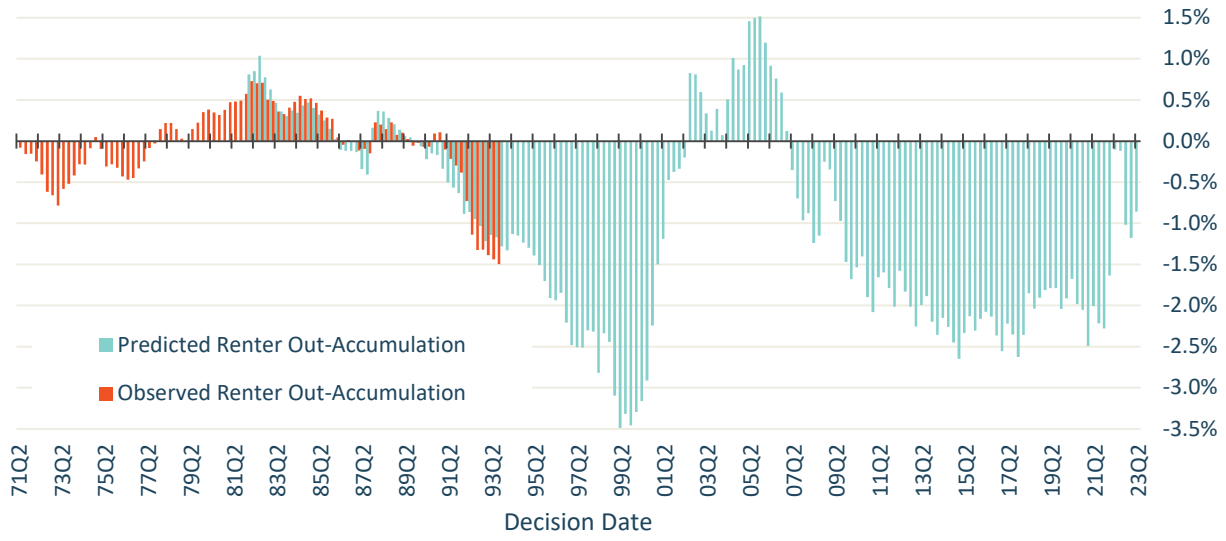
index in effect at the decision date both have the expected negative sign, suggesting that when housebuying is expensive then renting generally turns out to enable better wealth accumulation over the next 30 years. In particular, the coefficient on the housebuyer affordability index is negative at a very high level of confidence, while the coefficient on the mortgage interest rate is negative with only marginal confidence.

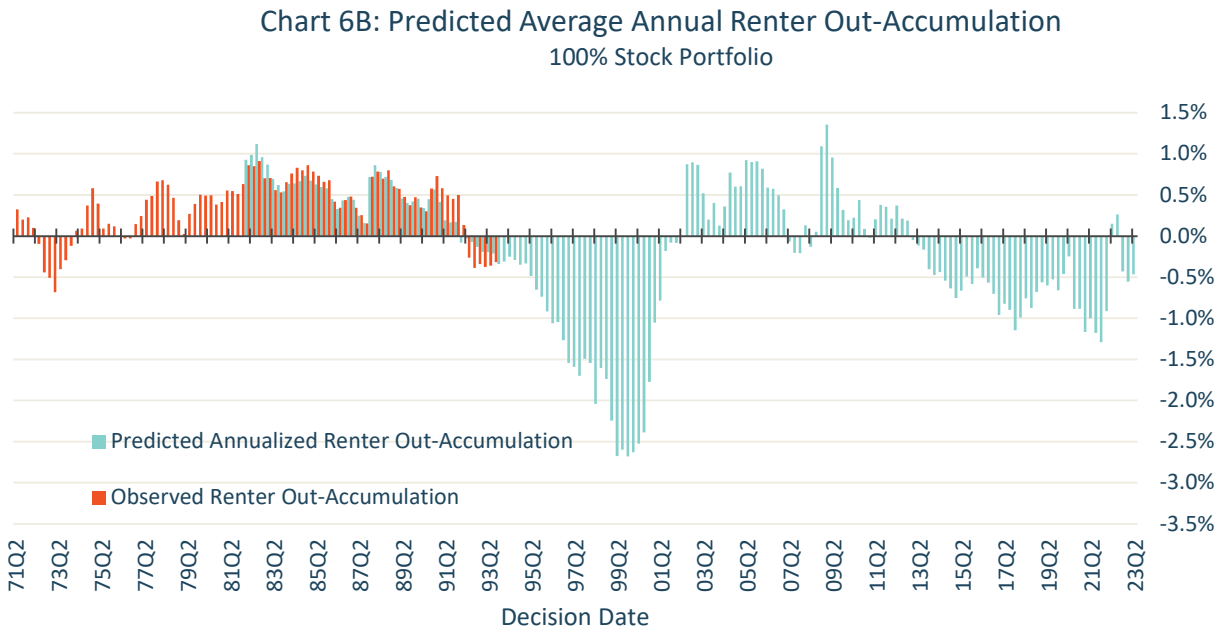
Perhaps the most important result pertains to the CAPE ratio, which measures how expensive stocks are (relative to earnings) and therefore how strong stock market returns are likely to be over a longer investment horizon. The coefficient on the CAPE ratio, which is negative with a very high degree of confidence, suggests that housebuying tends to be beneficial when investing in stocks would be a poor decision anyway, while renting tends to be superior when money that would otherwise be required for a down payment can instead be used to invest in stocks at favorable prices.

New-house sales volume has no incremental predictive power, but the Dallas Fed's exuberance measure turns out to have a stronger *t*-ratio than any other variable. As expected, a positive coefficient indicates that periods when "house prices are not based on housing market fundamentals" tend to be those when renting turns out to be far superior to housebuying, over the next 30 years, in terms of enabling wealth accumulation.

Chart 6A shows observed differences in average annual wealth accumulation rates between renters and housebuyers during the observed period (1971Q2-1993Q3) and predicted differences during the prediction period (1982Q1-2023Q2), assuming the baseline 69/31 portfolio. Predicted renter out-

Chart 6A: Predicted Average Annual Renter Out-Accumulation
69/31 Baseline Stock/Bond Allocation





accumulation reached its maximum value of +1.51% during 2005Q4, a time when the housebuyer affordability measure (extraordinarily low at 71) and the exuberance measure (near an all-time high at 5.90) suggested poor expected returns from investing in housing while the CAPE ratio (high, but not extraordinarily so, at 25.75) suggested weak but not terrible expected returns from investing in stocks. In contrast, predicted renter out-accumulation reached is minimum value of -3.49% during 1999Q2, a time when the CAPE ratio was near its all-time high at 42.48.

Chart 6B also shows observed and predicted renter out-accumulation but assuming a 100% stock portfolio. Under this assumption the +1.36% maximum value of predicted renter out-accumulation was in 2009Q1, a time when housebuying looked like a good idea—with the affordability measure at a favorable 119 and the exuberance measure near neutral at 0.14—but likely returns over the next 30 years looked extraordinarily favorable with a CAPE ratio of just 14.21. Predicted renter out-accumulation reached its minimum value of -2.68% both in 1999Q2 (the same quarter as the minimum value under the baseline 69/31 portfolio) and again in 1999Q4 under essentially the same market conditions. The most recent value, -0.46% in 2023Q2, indicates only a very slight predicted advantage to housebuyers based on a relatively high CAPE ratio of 29.16.

Until about 2000 there appeared to be a mostly-negative relationship between renter out-accumulation and new-house sales: when actual and/or predicted renter out-accumulation strengthened, the number of new-house sales would generally decline, suggesting that decision-makers seemed to take into account the likely relative

Table 3: Regression Results – New-House Sales

regressor	coefficient	standard error	*t*-stat	*p*-value
Intercept	1187	550	2.16	0.0369
Mortgage Interest Rate	-4589	1877	-2.45	0.0188
Housebuyer Affordability	7.296	3.48	2.10	0.0423
Shiller CAPE Ratio	-39.65	11.54	-3.44	0.0014
Exuberance Indicator	19.77	32.21	0.61	0.5428
Observed Rent minus Buy	-889	5405	-0.16	0.8702
Adj R^2 = 0.485 *F*-statistic = 9.7 N = 47				

financial performance of buying versus renting. Regressing New-House Sales volume directly on contemporaneous values of Rent Minus Buy and the other regressor variables, however, shows no effect of (eventual) renter out-accumulation on new-house sales volume after taking into account the other variables included in the analysis. As Table 3 shows, new-house sales have typically been higher during months in which first-time housebuyer affordability was better and mortgage interest rates were lower. Distressingly, new-house sales have also been higher during months in which the stock market CAPE ratio was lower—that is, during months when money spent on down payments could have been invested in stocks with stronger likely long-term returns. After taking into account those variables, however, neither the actual (eventual) renter out-accumulation nor the housing market exuberance indicator provided any incremental explanatory power.

The other factors affecting the rent-buy decision may explain why, since 2000, the negative relationship that had previously existed between renter out-accumulation and new-house sales seems to have broken down. During 2002Q3-2005Q3 predicted renter out-accumulation was positive but first-time housebuying continued to increase, suggesting that first-time housebuyers were failing to take into account conditions suggesting that renting was the better choice during that period. Conversely, during 2007Q2-2011Q1 predicted renter out-accumulation was negative but first-time housebuying continued to collapse, suggesting that decision-makers were failing to buy—presumably because, as a result of the Great Financial Crisis, they were unable to buy—even though conditions suggested that buying would be substantially more wealth-accretive

than renting over the following 30 years.

VOLATILITY AND RISK

In general the financial wisdom of an investment depends on the expected risk-adjusted return on that asset (or, where an investment portfolio already exists, the change in the expected risk-adjusted return on that portfolio as a result of adding the new asset). Under certain circumstances the risk-adjusted return on an asset can be computed using the Sharpe ratio, defined as the average excess return—that is, the average net total return minus the average total return on a risk-free investment—divided by the return volatility. The most important circumstances under which the Sharpe ratio can be considered a valid measure of risk-adjusted returns are (1) volatility is accurately measured and (2) volatility fully reflects risk.[16]

The average annualized rate of wealth accumulation is not a return measure, but both the "returns" and the "risk" of buying versus renting as a path to building wealth are relevant in evaluating which approach is superior. Assuming a 69/31 stock/bond portfolio allocation, the average rate of wealth accumulation during the observable historical period was equal for housebuyers and renters but the volatility of measured monthly wealth accumulation rates had a median value of 4.80% for buying and 9.95% for renting. There are important reasons not to use those results, however, to conclude that housebuying is financially superior to renting on a risk-adjusted basis.

One important reason is that the house price appreciation rates used in this analysis are based on a nationally diversified portfolio of owner-occupied houses—the S&P CoreLogic Case-Shiller Home Price Index—and are therefore less volatile than the price appreciation rates for a single house in a single market. A stock or bond investor can get the returns of an index (minus fund management fees) whereas a housebuyer can get only the return on a particular house, not on an index representing a diversified portfolio of housing.

Another reason is that the volatility of monthly returns (or, more accurately, the volatility of monthly rates of wealth accumulation) is likely not the correct statistic to use in measuring the risk of investment over such a long holding period. Anyone who purchases a house at least partly for investment reasons has revealed themselves to be focused on long-term returns rather than monthly volatility. Thus it is relevant that even a 100% stock portfolio has never provided annualized returns

[16] Other necessary assumptions include (3) returns are correctly measured net of fees and (4) the total return on the risk-free asset is correctly measured. All four requirements—especially the first two—are frequently violated in computing Sharpe ratios, especially but not solely in non-academic research.

averaging less than 8.65% per year over any 30-year period since April 1971, the starting date of this analysis (and, in fact, has never provided even a 12-year period of negative returns).

Moreover, the return and volatility of an index such as the S&P CoreLogic Case-Shiller are not accurately measured because the underlying assets are illiquid. As noted, several economists have researched and started to quantify the impact of illiquidity both on the measurement of investment returns and on the measurement of return volatility. Lin & Vandell [2007], for example, identify two separate biases: (1) a "marketing period bias" that their results suggest causes the volatility relevant for investment decision-making to be about 8% larger than the volatility measured in the U.S. housing market, and (2) a "liquidation bias" that their results suggest causes return to be overestimated by about 0.7% and volatility to be underestimated by around 0.4%.

This means that, even if the price appreciation measured for a nationally diversified housing portfolio were appropriate for a one-house investment, the return relevant to an individual's investment decision would be less than the return measured by the index, while the relevant volatility would be greater. The effects of illiquidity on the measurement of returns and risk are not yet fully understood, but the research published to date makes clear at least that housebuying is not as attractive, on a risk-adjusted returns basis, as a naïve comparison suggests.

HOUSING SIZE AND QUALITY

As noted above, for this comparison we assume that (1) a housebuyer purchases a house at the median new-house sale price and (2) a renter rents at the median rent. It would be straightforward to compare the quality of housing units if quality depended only on a readily measurable attribute such as square footage, but it is extremely difficult to compare housing units that differ on a wide range of attributes many of which are not readily measurable such as location amenities or views. Nevertheless, it can be surmised that a house priced at the median new-house sale price may be of higher quality than a housing unit rented for the median rent. That suggests that a housebuyer may be consuming "more" (or better) housing than a renter, which could affect the comparison.

The buy/rent decision is complicated, however, by the difficulty and expense of changing the level of consumption of owned housing. In general, the desired amount (or quality) of housing is likely to change over time: for example, an initially childless couple may purchase a multi-bedroom house in anticipation of a larger family to come, and may then remain in the multi-bedroom house even after children have formed their own households and left them "empty-nesters." In contrast, it is much easier for

a renter to change the amount (or quality) of housing actually consumed as desired housing changes.

Indeed, if housebuying were clearly superior to renting on financial investment grounds, then we could expect to see much greater "excess consumption" of owned housing. Instead, housebuyers make what is likely a conscious tradeoff between (1) buying too-costly a house and therefore failing to invest the excess in better investments such as stocks versus (2) buying too-small a house and therefore being unhappy although accumulating wealth more rapidly.

In short, the mismatch between desired and actual housing consumption can be catalogued as an additional implicit cost of housebuying, and the potential mismatch between the median-priced house purchased by a buyer and the median-priced unit rented by a renter does not necessarily indicate a more desirable situation for either.

CONCLUSION

The decision whether to buy or to rent is complicated. No analysis is likely to provide a satisfactory answer in every set of circumstances, but perhaps a few useful rules will be helpful in every case:

- House price appreciation is low enough that buying a house is not obviously a good investment, even when the use of leverage is taken into account.
- Renting is not failing to invest (or "throwing money away")—rather, renting frees up capital for investment in a better-performing asset.
- A simplistic comparison of mortgage payments (for principal and interest) with rent payments fails to account for additional costs that are faced only by housebuyers such as for maintenance & repairs, property taxes, real estate agent fees, and amenities such as swimming pools and exercise facilities.
- The extreme difficulty and cost of transacting a house—that is, the extreme illiquidity of the asset—imposes additional costs that should not be underestimated. Illiquidity means that the returns on housing investment are lower than they seem while the volatility of investment returns is higher than it seems; illiquidity forces housebuyers to over- or under-consume the quantity and/or quality of their housing; and illiquidity may even reduce their wealth accumulation by making it difficult for them to move toward the best employment opportunities.
- People who show themselves willing to invest in an illiquid asset are also revealing a focus on long-term returns rather than short-term volatility—which means they should be willing to take advantage of the

opportunity to invest more in riskier, higher-returning assets such as stocks.

Without question the purchase of a particular house in a particular location may turn out to have been a better investment at a particular time than renting a particular housing unit in a particular location at the same time. As a general rule, however, renting has turned out to enable greater wealth accumulation than housebuying over the available historical period under a set of reasonable assumptions. At the very least it should be recognized that the buy/rent decision should not be evaluated simplistically. Perhaps a more useful rule of thumb would be this: "Buy because you have found a house that you want to live in but you can only live in it if you buy it. Otherwise and until then, rent and invest."