NBER WORKING PAPER SERIES

HETEROGENOUS RATES OF RETURN ON HOMES AND OTHER REAL ESTATE: DO THE RICH DO BETTER? DO BLACK HOUSEHOLDS DO WORSE?

Edward N. Wolff

Working Paper 30543
http://www.nber.org/papers/w30543

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
October 2022

An earlier version of this paper was presented at the 37th IARIW General Conference, Luxembourg, August 22-26, 2022. I would particularly like to thank my discussant Sofie Waitl for her very helpful comments. The views expressed herein are those of the author and do not necessarily reflect the views of the National Bureau of Economic Research.

Heterogenous Rates of Return on Homes and Other Real Estate: Do the Rich Do Better? Do Black Households Do Worse?

Edward N. Wolff

NBER Working Paper No. 30543
October 2022
JEL No. D31,H31,J15

ABSTRACT

Recent work on wealth inequality based on the capitalization method wherein aggregate wealth totals are distributed in proportion to various forms of income like dividends has motivated a concern about whether rates of return on assets vary across the wealth distribution. In this study, I use a new data source, accrued capital gains on homes and other real estate as reported in the Survey of Consumer Finances. I find strong econometric evidence that returns on homes vary directly with wealth level and are considerably higher for the very wealthy compared to the middle class and lower wealth households. However, there is no evidence from the preferred specification that Black or Hispanic families receive lower returns on their property once controlling for factors such as years of occupancy and overall house price movements in the market. The number of years of occupancy is also a highly significant determinant of returns on homes. The effect is strongly negative because communities of residence become less desirable and real properties deteriorate physically over time, both factors reducing property values. Returns on individual homes are also strongly related to overall house price movements in the market, suggesting that timing the market is a key determinant.

Edward N. Wolff
Department of Economics
New York University
19 W. 4th Street, 6th Floor
New York, NY 10012
and NBER
edward.wolff@nyu.edu

1.Introduction

Is the rate of return on homes and other real estate greater for the rich than the middle class? Do Black families receive a lower rate of return on their homes than whites?

There are several motivations for an examination of this issue. First, recent work on wealth inequality based on the so-called capitalization technique wherein aggregate wealth totals are distributed in proportion to various forms of income like dividends has motivated a concern about whether rates of return on assets vary across the wealth distribution.

Second, the work of Benhabib et al. (2011), Benhabib et al. (2017), and Benhabib et al. (2019) point out the importance of heterogenous rates of return on household assets as a factor accounting for the overall dispersion of wealth across households. If wealthier households earn higher returns, all else equal, their net worth will grow at a faster rate, further pushing up their share of aggregate wealth and wealth concentration.

A third reason is that the issue is important is due to Senator Ron Wyden's proposal on Oct. 26, 2021 to tax unrealized capital gains on billionaires. Though Biden rejected the idea in his final legislative proposal to Congress, this topic has recently re-appeared in discussions of tax policy in the U.S.

The paper is organized as follows. The next section (section 2) provides a review of the relevant literature. Section 3 provides a description of the data sources used in this study and the methodology. Section 4.1 presents descriptive statistics on overall trends in rates of return on homes and other real estate. Sections 4.2, 4.3, and 4.4 offer a breakdown of rates of return for principal homes, other residential real estate, and commercial real estate, respectively, by income class, wealth class, and demographic characteristics. Section 4.5 furnishes a multivariate regression analysis of factors explaining the variation of rates of return across these characteristics. Section 4.6 analyzes the effects of differential rates of return by wealth class on overall wealth inequality. Concluding remarks are provided in Section 5.

2. Literature Review

Several studies have considered the question of whether rates of return to assets vary across households. In one of the earliest studies, Blume et. al. (1974, p. 26), looks at the relation of dividend yield to household income in 1969. The study finds that dividend yield, rather interestingly, varied inversely with income but the range was very small (2.51 percent to 2.78 percent). Second, Feldstein and Yitzhaki (1982) find that high income investors received a

higher rate of return on their investments than low income ones. However, the study, based on income tax returns, relied exclusively on capital gains realized on corporate stock and the differences were not great.

Third, Wolff (1987) looks at asset yields by income class on the basis of the 1962 Survey of Financial Characteristics of Consumers (and reported in Wolff, 2017, Table A1.2 of Appendix 2). The motivation of this study is to allocate national balance sheet totals (in this case, from the Flow of Funds) across households on the basis of their corresponding income flows. The results indicated that bond yields were notably higher for the top income class ($100,000 or more) than the eight lower income classes. However, dividend yields on stocks showed very little systematic variation with income class (they were actually highest for the second and sixth income class). Returns on unincorporated business were highest for the two middle income classes and lowest for the top two and bottom income classes. Yields on trust equity tended to be inversely related to income, highest at the bottom and lowest at the top of the income distribution.

Fourth, Johnson, Raub, and Newcomb (2013) use micro estate tax data of 2007 decedents matched to 2006 income tax returns to analyze rates of return by wealth class. If anything, they find slightly decreasing rates of returns for some asset classes by wealth level. Fifth, Saez and Zucman (2016), "SZ" hereafter encounter the same issue in their capitalization technique since they also assume a uniform rate of return across income classes and provide three pieces of evidence supporting this assumption. They also use match estate-income returns like Johnson et. al. (2013) and analyze three datasets. The first piece of evidence is based on publicly available Statistics of Income (SOI) tabulations of matched estate-income returns for 2008. SZ find that within-asset-class returns were fairly constant across wealth groups. Although rates of returns varied across individuals, they were similar across wealth groups.

The second source of evidence is the internal SOI matched estate and income tax files over years 1996–2011. SZ match the estate tax returns of non-married individuals dying in this period to their prior-year income tax returns. They find that the interest rate on bonds and deposits did not vary much with wealth level. In 1997, for example, the interest rate was 3.9 percent on aggregate, and between 4.1 and 4.3 percent for all groups of estate tax payers ranging from $0.5–1 million to more than $20 million. The third source is a publicly available sample of estates filed in 1977. SZ once again find that rates of return within asset class were very similar across wealth groups. Individuals in the top 0.1 percent and top 0.01 percent had an average

dividend yield of 4.7 percent, about the same as the average dividend yield of 5.1 percent among all decedents.

Sixth, Fagereng et. al. (2016), using Norwegian individual wealth returns over twenty years, reports econometric evidence of a positive correlation between wealth level and risk-adjusted rate of return (the Sharpe ratio) by asset type. The differentials were quite large – a difference of 180 basis points (that is, 1.8 percentage points) between the 10th and 90th percentile of the wealth distribution in 2013. Seventh, Bricker et. al. (2016), found a huge discrepancy on interest-bearing assets between the very rich compared to the average household. In particular, in the 2013 SCF, the average rate of return on fixed-income assets (defined as the ratio of SCF interest income to SCF fixed-income assets) across all households was about 1 percent, but the average return for the top one percent of families was almost 6 percent.

Another group of papers also documents heterogeneity in returns on assets across the wealth distribution. Campbell et al. (2019) use administrative data from the Indian stock market and show that a positive correlation of log returns with initial log wealth accounted for 84 percent of the increase in inequality of wealth held in equities by Indian investors between 2002 and 2011. However, the analysis is confined to only wealth held in the form of equities and there is no indication that returns on equity are positively correlated with *total* household wealth.

Fagereng et al. (2020) analyze individual returns to wealth using 12 years of population data from Norway's administrative tax records. They find, first, that individuals earn markedly different average returns on their net worth and on its components. Second, heterogeneity in returns arises not only from differences in the portfolio allocation of wealth between safe and risky assets but that returns are heterogeneous even within narrowly defined asset classes. Third, and most importantly from the standpoint of this paper, returns were positively correlated with wealth level -- moving from the 10th to the 90th percentile of the net worth distribution increased the return by a remarkable 18 percentage points (and 10 percentage points if looking at net-of-tax returns).

Bach et al. (2020) reports similar results using an administrative panel containing the disaggregated balance sheets of Swedish residents. They find that the expected return on household net wealth was strongly persistent, determined primarily by systematic risk, and, more importantly from our standpoint, increasing in net worth. Sakong (2022) finds a similar pattern by estimating the trading patterns for households across wealth levels in the US housing

market for 1988-2013. The estimated dispersion in expected returns between buying and selling price is large, with an interquartile-range difference is 60 basis points per year.

Kartashova and Zhou (2021) examine changes in wealth inequality in the U.S., measured by the top 1% wealth share, over the first year of the COVID-19 pandemic. They use data from the SCF to measure portfolio composition for different wealth groups and market data such as the S&P 500 index of overall stock yields to estimate the returns to net worth for different groups of households. The return to net worth is the weighted average of the returns to individual wealth components. They found that portfolio heterogeneity and asset price movements were the main determinants of wealth returns and inequality, whereas saving-rate heterogeneity and within-class return differences played a minor role. As the stock market continued to outperform the housing market, the return of the wealthy rose faster than that of other households, reinforcing the wealth concentration at the top. They also document a widening racial return gap between white and Black households and found that nearly all of the racial differences in the wealth return were explained by differences in wealth, not by race itself. However, they did not examine differential rates of return by asset type for different groups of households. This is the contribution of my paper.

Wolff (2022) also found that portfolio differences between white and Black households as well as between white and Hispanic ones explain a large portion of the change in the wealth gap between the two groups over time. Like Kartashova and Zhou (2021), the return to net worth by group is estimated as the weighted average of the returns to individual wealth components. Wolff finds, for example, that differentials in portfolio revaluation between minorities and whites accounted for 43 percent of the gain in the relative net worth of Black households over years 2001 to 2007 and 39 percent of the decline from 2007 to 2010, and 33 percent of the relative gain among Hispanics over the first period and 28 percent of the drop over 2007-2010. However, as in the preceding study it is assumed that rates of return *by asset type* were the same across racial/ethnic group.

Several studies address the issue of whether there are differentials in property values on homes and other residential properties by race. Earlier research, summarized by Blau and Graham (1990), concludes that homes in African-American neighborhoods appreciated at a lower rate than those in predominantly white areas. Oliver and Shapiro (2006) report similar results. However, in an examination of mean housing prices by race using the decennial

Censuses for 1960 to 1990, Denton (2001) finds that the ratio of the value of African-American to white homes, while still well below unity, reached its highest level in 1990.

Using data from the American Housing Survey, Fabera and Gould (2016) examine the variation of rising housing prices among people of different racial categories who purchased their homes before the boom from 2000 to 2007 and kept them through the bust of 2008. They find that Blacks and Hispanics gained less equity than whites during that period and were more likely to owe more than their home was worth. The researchers find that the racial gaps were driven in part by racial disparities in income and education and differences in types of homes purchased. They hypothesize that racial segregation and the corollary economic and education stratification between neighborhoods exacerbated existing equity disparities within neighborhoods with high concentrations of poverty. Consequently, the Great Recession hit those neighborhoods disproportionately harder. Declining incomes reduced people's ability to purchase homes, thus deflating prices in those neighborhoods. However, their analysis covered years 2000 to 2008 only whereas my study considers the period from 1989 to 2019.

Perry et al, (2018) define Black communities as those in which at least half the residents are Black. Using data from the 2016 American Community Survey 5-Year Estimates (ACS), they calculate that 37 percent of the U.S. Black population live in Black communities. Moreover, they find that in the average U.S. metropolitan area, homes in neighborhoods where the share of the population was at least 50 percent Black were valued at roughly half the price as homes in neighborhoods with no Black residents. They report that there is a strong and powerful statistical relationship between the share of the population that is Black and the market value of owner-occupied homes. Location in a Black neighborhood predicted a large financial penalty for 117 out of the 119 metropolitan areas with majority Black neighborhoods. Homes of similar quality in neighborhoods with similar amenities were worth 23 percent less in majority Black neighborhoods, compared to those with very few or no Black residents. Majority Black neighborhoods did exhibit features associated with lower property values, including higher crime rates, longer commute times, and less access to high-scoring schools and well-rated restaurants. Yet, these factors explained only roughly half of the undervaluation of homes in Black neighborhoods. Segregation was negatively correlated with Black home valuations. The authors believe that anti-Black bias is the reason this undervaluation occurs. However, the study covers years 2012-2016 only and no estimates are provided of the percentage appreciation in homes for

Black homeowners versus whites as I do in my paper. Moreover, it is not clear what share of Black *homeowners* live in so-called Black communities. There may be a substantial difference between black homeownership overall and black homeownership just in black communities. My study, in contrast, looks at all Black homeowners.

Several papers document a pattern in which minority homeowners pay higher prices for homes but subsequently experience lower rates of return on home values due to discriminatory market forces such as redlining and "white flight." These include Bayer et al. (2017) and Akbar et al. (2019). The latter, in particular, look at neighborhood-level house price appreciation and find that homes in Black neighborhoods experienced slower house price growth than those in white neighborhoods. Several studies document that minority homeowners pay a higher price for identical housing than white homeowners. These include, first, Myers (2004), who estimates that even with relatively thorough neighborhood controls black homeowners pay premiums of around 10 percent for housing. Moreover, house values decline in neighborhoods as the percentage of blacks increases. Second, Ihlanfeldt and Mayock (2009), using a sample of single-family home sales from Florida where both the race of the seller and buyer are known, present evidence that price discrimination exists by whites against blacks.

Other papers find that white homeowners enjoy a higher rate of home price appreciation than Black ones. These include, first, Flippen (2004), who examines whether housing in predominantly minority neighborhoods appreciate more slowly than comparable housing in predominantly white communities and if so the extent to which the gap is due to neighborhood racial composition per se. The author estimates real housing appreciation by using a hedonic price analysis on data from the Health and Retirement Study combined with information from the 1970, 1980, and 1990 Census of Population. He finds that while much of neighborhood price appreciation is explained by socio-economic factors, minority composition exerts a statistically significant effect on housing appreciation net of these factors, particularly in highly segregated communities and those that experience large increases in Black population.

Second, Anacker (2010), using Census tract data within select counties across the United States, investigates differences among suburban Census tracts in terms of several factors, including property values and their appreciation rates and factors that influence property values. The results indicate significant racial differences in housing price appreciation even after

controlling for pertinent factors. The third is Sakong (2022), discussed above, who also finds significant racial differences in expected returns between buying and selling price.

The fourth is Kahn (2021), who notes that the racial and ethnic composition of home buyers varies across geographic locations. For example, Hispanics are much more likely to buy homes in California than Blacks and Blacks are more likely to buy homes in Georgia than other racial/ethnic groups. Home prices grow at different rates across geographic units such as counties or zip codes. Spatial variation in purchases suggests that the average rate of return to housing varies across racial and ethnic groups. To test this claim, the author constructs a geographic "shiftshare index" by combining Zillow geographic specific home price index data with the Home Mortgage Disclosure Act (HMDA) micro data. The shift share calculations yield the average rate of return to home ownership by purchase and sale year. The author finds that over years 2007-2020, Blacks earned a lower rate of return on home purchases than Asians and Hispanics and the sample average.

Fifth, Aaronson et al (2020) look at the effects of the 1930s-era Home Owners Loan Corporation (HOLC) "redlining" maps, which documented the relative riskiness of lending across neighborhoods, on the long-run development of neighborhoods. Using a boundary design and propensity score method, they find that the maps led to reduced homeownership rates, rents, and most notably house values for the Black population and increased racial segregation in later decades.

In a very recent paper, Kermani and Wong (2022) make use of a series of novel data linkages performed by the Fisher Center for Real Estate and Urban Economics at UC Berkeley to investigate racial disparities in housing returns. At the center of the analysis is a linkage between mortgage origination records that contain homeowners' self-reported race and ethnicity and real estate transaction records that capture the sale prices of property and enable them to compute housing returns at the household level. The authors observe homeowner race and ethnicity in the Home Mortgage Disclosure Act (HMDA) data. With the exception of mortgages originated by small financial institutions that are exempt from these reporting requirements, the HMDA data capture the near-universe of mortgage originations going back to the 1990s. They then measure property characteristics and sale prices using data collected from local government assessor and recorder offices by ATTOM, a private data provider. A key component of their analysis entails comparing regular sales to distressed sales.

Kermani and Wong (2022) then compute two alternative measures of the rate of return to housing. The first is the "unlevered rate of return." This is essentially the difference between the sales price and purchase price over the number of years of occupancy. The formula for homeowner i is:

$$r_{ui} = (P_{i1}/P_{i0})^{1/(Ti1-Ti0)} - 1$$

where P_{i1} and P_{i0} are the property purchase and sale prices, respectively, and $T_{i1} - T_{i0}$ denotes the length of the ownership spell in years. I quite independently use a somewhat similar measure (see equation 1) though it is based on the SCF data and uses the current value of the property as estimated by the owner instead of the sales price (I do not have any data on sales).

The second is the levered rate of return. In this measure the initial investment is based on the down payment for the property plus the closing costs. They also impute the rental value of the property in the computation, as well as several other imputations. They also adjust for distressed sales (that is, foreclosures and short sales). In comparison, I have no information on the down payment or closing costs from the SCF data. They find a racial gap in unlevered measure and an even bigger racial gap in levered measure. The most comparable concept to mine is the unlevered measure. Their preferred estimate, which adjusts for finite sample bias and cash purchases, indicate that Black and Hispanic homeowners realized unlevered returns that are 1.8 and 1.1 percentage points lower per year than white homeowners, respectively. I also find a racial gap in housing returns in favor of white households in the raw data but not with controls. Moreover, I find that Hispanic households actually enjoyed a higher rate of return than white households in the raw data at least but not with controls.

In sum, several recent papers – in particular, Fagereng et. al. (2016, 2020) for stocks and Bricker et. al. (2016) for bonds -- do find evidence that rates of return on financial assets are positively correlated with wealth level. However, there is almost no analysis of the variation in rates of return on homes and other real estate across the income and wealth distribution with the notable exception of Sakong (2022) who does find that returns are increasing in net worth. Though my paper reports a similar result, my methodology is completely different. This paper is thus among the first to empirically analyze rates of return on household-owned real estate across income and wealth class (among other household characteristics like race) on the basis of accrued capital gains. With regard to racial disparities in rates of return on homes, the studies to

date uniformly find that Black households receive a lower rate of return than white households. I do find a similar pattern in the raw data on homeownership. However, I find no evidence from my preferred specification that Black or Hispanic families received lower returns on their property once controlling for relevant factors such as years of occupancy and overall house price movements in the market.

3. Data sources and methods

The primary data source used for this study is the Survey of Consumer Finances conducted by the Federal Reserve Board. I have selected the most recent year, 2019 for two reasons. First, it is the most current data available. Second, in my regression analysis, I require a home price series that covers 60 years. As discussed below, I use the National Association of Realtors (NAR) home price series, which begins only in 1971. This gives me at least 48 years of data. If I had chosen an earlier SCF file, the data series would have been even shorter.

Each SCF survey consists of a core representative sample combined with a high-income supplement. Starting in 1989, the first sample was selected from a standard multi-stage area-probability design. This part of the sample was intended to provide good coverage of asset characteristics such as home ownership that are broadly distributed. The second sample, the high income supplement, was selected as a so-called "list sample" from statistical records (the Individual Tax File) derived from tax data by the Statistics of Income (SOI) Division of the Internal Revenue Service. In this case, the IRS provided the names and addresses of a sample of very high income families. This second sample was designed to disproportionately select families that were likely to be relatively wealthy (see, for example, Kennickell and Woodburn. 1999). The advantage of the high-income supplement is that it provides a much "richer" sample of high income and therefore potentially very wealthy families. However, the presence of a high-income supplement creates some complications, because weights must be constructed to meld the high-income supplement with the core sample. Typically, about two thirds of the cases came from the representative sample and one third from the high-income supplement. In the 2007 SCF the standard multi-stage area-probability sample contributed 2,915 cases while the high-income supplement contributed another 1,507 cases.

The key variable of interest in this study is accrued capital gains. The SCF provides this information for five assets: (1) homes (or, more specifically, principal residences); (2) other real estate owned by the household; (3) businesses; (4) farm businesses; and (5) stocks and mutual

funds (in aggregate). However, in order to compute annualized rates of return on assets, it is also necessary to have information on the date of purchase and consequently, the holding period for the asset. This data is provided for only the first two assets. As a result, this study will be limited to principal residences and other real estate. I also restrict the sample to assets whose holding period is at least one year. I will later use other variants of this in the empirical analysis. This information allows me to compute the annual *nominal* rate of return on the asset. However, since I know the purchase date, I can also compute the average annual change in the CPI-U-RS between the purchase date and the current year. The real rate of return is then defined as the nominal rate of return minus the average annual change in the CPI-U-RS.[1]

One key limitation of this study is that the SCF does not provide any geographic details on where families live such as state or region or even urban versus suburban and rural.[2] This is unfortunate in analyzing the racial or ethnic wealth gap in rates of return on homes since it is likely that whites, Blacks Asians, and Hispanics have significant differences in geographic distribution and as Case and Shiller (1989) show there is substantial geographic dispersion in such rates of return.

4. Results

4.1 Overall Trends

The average annual real rate of return on principal residences is defined as:

$$RORHome = \ln [(PP + AKGH)/PP] / T$$

where PP is the purchase price of the property converted to 2019 dollars on the basis of the CPI-U-RS, AKGH is the accrued capital gains on the property converted to 2019 dollars, and T is the holding period (that is, years of ownership) of the property. I prefer this formulation to ln(CV/PP)/T, where CV is the current value of the property (in 2019 dollars) because AKGH is defined in the SCF for principal residences as the current value of the property less the original purchase price and less improvements. Improvements are defined as the total cost of all remodeling or additions to this property. However, for other (non-principal home) real estate, there is no netting out of improvements on the property.

[1] The CPI-U-RS is used for years 1977 onward and the CPI-U is used for earlier years. The average annual price change is defined as the arithmetic average of the annual logarithmic change in prices over the relevant period.

[2] This is done to prevent disclosure of the actual identity of the household.

Figure 1 compares trends in the real rate of return on the primary residence from the 2019 SCF based on accrued capital gains with the National Association of Realtors (NAR) series on the median sales price of existing single-family homes for metropolitan areas.[3] The latter series runs from 1971 to the present. There are three other long-term home price series that I could find. The first is the S&P/Case-Shiller U.S. National Home Price index for metropolitan areas. It is constructed as a benchmark of average single-family home prices in the U.S., calculated monthly based on changes in home prices over the prior three months. However, the series runs from only 1987 to the present.[4] The second is the series Median Sales Price of Houses Sold in the United States (MSPUS).[5] The series runs from 1963 to the present.

[Figure 1 about here]

The third is the FHFA (Federal Housing Finance Agency) House Price Index (FHFA HPI), which measures changes in single-family home values based on data from all 50 states and over 400 American cities that extend back to the mid-1970s. The FHFA HPI incorporates tens of millions of home sales, uses a weighted, repeat-sales statistical technique to analyze house price transaction data, and measures average price changes in repeat sales or refinancings on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. However, publicly available data starts only in January 1991.

An alternative FHFA series is the so-called All-Transactions Index, which is estimated using sales price and appraisal data. This is a quarterly series and begins in the first quarter of

---

[3] The source for years 1989 to 2007 is Table 935 of the *2009 Statistical Abstract*, US Bureau of the Census, available at http://www.census.gov/compendia/statab/. For years after 2007, the source is: National Association of Realtors, "Median Sales Price of Existing Single-Family Homes for Metropolitan Areas," available at: http://www.realtor.org/sites/default/files/reports/2012/embargoes/2012-q1-metro-home-prices-49bc10b1efdc1b8cc3eb66dbcdad55f7/metro-home-prices-q1-single-family-2012-05-09.pdf [both accessed October 9, 2021].The figures are based on median prices of existing houses for metropolitan areas only.

[4] The source is S&P Dow Jones Indices LLC, S&P/Case-Shiller U.S. National Home Price Index [CSUSHPINSA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CSUSHPINSA, December 19, 2021.

[5] The source is U.S. Census Bureau and U.S. Department of Housing and Urban Development, Median Sales Price of Houses Sold for the United States [MSPUS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/MSPUS, December 20, 2021.

1975.[6] This is preferred to the FHFA HPI since it is a longer time-series. Moreover, it is preferred to the Case-Shiller Index and the MSPUS since it includes house price changes on existing homes only and is therefore closer to the SCF accrued capital gains series.[7]

My preferred alternative house price series is the NAR existing median home price series, rather than the Census/HUD or Case-Shiller series, because capital gains occur only on existing homes, not new homes added to the housing inventory. The latter two series includes price data on both existing homes and new homes. The NAR series is thus more consistent with the SCF accrued capital gains series than the other two. Moreover, I use the NAR series rather than the FHFA series since it covers a longer period of time.

Results in Figure 1 are shown by holding period – that is, years of occupancy or homeowner tenure. Because I have annual data, the NAR rate of return (RORNAR) is defined as the arithmetic average of the annual logarithmic change in prices in 2019 dollars over the relevant period. As can be seen, the SCF and NAR series track very closely. Not unexpectedly, there is more volatility in the SCF series because of sampling variability (some of the data points are based on relatively small sample sizes). There is also a discrepancy between the two series for holding periods from one to six years in which the SCF data show a downward trend while the NAR data show an upward trend. However, both series show a sharp downward trend in the real rate of return on homes from about 6 years to 13 years of occupancy, followed by an upward trend until about 26 years and then a fairly flat profile after that.

The disparity in the two series over the first half dozen years or so may be due to the fact that households tend to inflate the current value of their homes while the purchase price is correctly indicated.[8] This will lead to an overestimate of the accrued capital gains on their home and thus their rate of return. For example, over the first half dozen years or so, RORHome is

[6] The source is: U.S. Federal Housing Finance Agency, All-Transactions House Price Index for the U.S. (USSTHPI), retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/USSTHPI, September 20, 2022. Index, 19080Q1 = 100, not seasonally adjusted.

[7] Another alternative from the FHFA is their Expanded-Data Indexes, estimated using Enterprise, FHA, and Real Property County Recorder licensed from DataQuick for sales below the annual loan limit ceiling. This series also begins in the first quarter of 1975. Time trends are very similar to the FHFA All-Transactions Index and, as a result, I do not show time trends for this series.

[8] I thank my discussant Sophie Waitl for making this point. Lepinteur and Waitl (2021) discuss this issue at some length. They then propose a correction for the current value of the property in the case of both Italy and the U.S. that allows a smoother trajectory of rates of return on homes over time.

consistently higher than RORNAR. Another awkward result is that RORHome tends to zigzag over time, at least for the first half dozen years or so. This may also be a consequence of a measurement error in current home value and a consequent mismatch between the owner-reported current home value and its purchase price.

However, from the point of view of the multivariate regression analysis to be performed later, the pertinent issue is whether there is a systemic bias in the measurement error in estimating the current value of one's property. That is to say, is there a systematic bias in the discrepancy by demographic factors, income, and wealth? For example, are the rich (or whites) more likely to overstate the current value of their property than the poor (or Blacks)? This is, of course, impossible to determine, so that I simply assume no systematic bias.

For comparison, I also show the annual rate of return for the the Census/HUD Median House Price Series and the Case-Shiller National Home Price Index (Figure 2). These are defined analogously to the NAR rate of return series. Over the first 8 years, while the SCF series shows a downward trajectory, these latter two series show the opposite. In fact, the Census/HUD series is actually negative over the first three years. However, after year 8 or so, the three series track relatively closely, with a pronounced downward trend from about 8 years to 13 years of occupancy, an upward movement until about 26 years and then a relatively flat profile after that.

[Figure 2 about here]

The SCF-based ROHome series seems to line up better with the HFHA USSTHPI than it does with RORNAR (see Figure 3.) However, once again the FHFA series shows rising rates of return over the first dozen years or so while the RORhome series shows declining returns. Also, as before, RORhome exceeds the rate of return calculated using the FHFA data for the first six years or so. However, after this point, the two series tracks very closely.

[Figure 3 about here]

4.2 Principal residences

I begin with descriptive statistics for 2019. I include only real estate (homes and other real estate) with a minimum one year holding period. Table 1 shows results for 2019 for principal residencies excluding mobile homes, farms, and ranches. The picture is rather mixed with respect to income and wealth levels. There is a slight downward gradient with respect to income for mean values of annual rates of return ("ROR") in nominal values but a slight upward gradient for median values. For real ROR, there is a slight downward trend in mean values but a

clear upward trend in median values.[9] With respect to wealth, mean nominal and real ROR peaks in the third quintile but median values show an upward gradient. Median real ROR has a peak value of 2.17 percent among the top one percent of wealth holders, compared to 0.51 percent for the bottom quintile. However, overall, there is no clear evidence from the descriptive statistics that richer households enjoy higher returns on their homes than poorer ones.

[Table 1 about here]

There are also strong differences with regard to housing tenure. Holding periods generally decline with income level but increase with wealth level. The mean holding period for principal residencies falls from 22.4 years for the bottom income quintile to 13.8 years for the top one percent and the median holding period from 19.0 to 11.0 years. In contrast, the mean value climbs from 5.3 years for the bottom wealth quintile to 15.6 years for the top one percent and the median from 2.0 to 14.0.

As to be expected the homeownership rate rises with income and wealth. In 2019, the overall homeownership rate ascended monotonically from 37.3 percent for the bottom income quintile to 96.9 percent for the top income percentile and from 18.1 percent for the bottom wealth quintile to 95.6 percent for the top wealth quintile. The restricted homeownership rates are considerably lower for the bottom three income quintiles and the second and third wealth quintiles (a reflection of the high rate of mobile home ownership) but display the same pattern with respect to income and wealth level.

Households in the SCF are divided into four racial/ethnic groups: (1) non-Hispanic whites ("whites" for short), (2) non-Hispanic Blacks ("Blacks" for short), (3) Hispanics (which can be of any race), and (4) Asian-Americans and others ("Asians" for short). Black households had lower nominal and real ROR in 2019. This is true for both mean and median values. However, the disparity in real ROR is relatively small, at least compared to discrepancies across income and wealth class. In 2019, the mean real ROR for Blacks was 2.02 percent, compared to 2.69 percent for whites, and the median RORs were respectively 0.40 and 1.19 percent. Blacks had longer mean and median holding periods than whites.

[9] As noted above, the real rate of return is defined as the nominal return less the average annual logarithmic change of the CPI. The CPI-U-RS is used for years 1977 onward and the CPI-U for years before 1977.

In contrast, Hispanics had notably higher rates of return than whites. This is true for both mean and median nominal and real ROR. Hispanics also had notably shorter holding periods, which may partly explain their higher ROR (see Section 4.5 below). In 2019, Asian-Americans had about the same mean nominal and real ROR as whites but higher median ROR. Their holding periods were also considerably shorter than those for whites. Homeownership rates (both overall and restricted) were notably smaller for Blacks and Hispanics than whites in 2019. Asian-Americans were in the middle.

Mean and median nominal and real RORs declined almost monotonically with age class in 2019. Differences were quite considerable. For example, in 2019 the mean real ROR for the under 35 age group was 4.01 percent while that for age group 75 and over was 1.22 percent. Not too surprisingly, mean and median holding periods increased monotonically with age. Here, too, there were considerable differences – 3.4 years for the mean holding period for the under 35 age group compared to 30.6 years for the 75 and over age group. Homeownership rates, perhaps not surprisingly, rose monotonically with age. The differences were quite large – an overall homeownership rate of 82.4 percent for the 75 and over age group versus one of 36.2 percent for the under 35 age group in 2019.

Patterns with respect to educational attainment were more mixed. In 2019 the peak mean and median ROR in both nominal and real terms occurred for 13-15 years of education. Years of tenure in the property declined with level of schooling. In contrast, the homeownership rate rose with educational attainment, from a low of 51.0 percent for those with less than a high school degree to 75.1 percent for college graduates in 2019.

In 2019 real and nominal mean and median RORs were greatest for married couples, second highest for single males, and lowest for single females. However, homeowner tenure showed the inverse pattern.

4.3 Other Residential Real Estate

I next look at the same set of statistics for “other real estate” – that is real estate excluding principal residence (which I also call “non-home real estate”). I have followed the SCF convention in dividing this category into residential and non-residential real estate (which I also call “commercial”). The division does seem a little arbitrary at points. I classify the following categories as commercial (on the basis of variables X1703 and X1803 in the 2019 SCF): (a) farm/ranch -- any mention; (b) land only: lot, tract, acreage, building lots, "farmland"; (c)

substantial land and some other type of structure; (d) recreational property, sports field, or golf; (e) mobile home park; (f) 5 or more unit residence; (g) "apartment house" -- number of units unknown, "rental units" or "property", n.f.s.; (g) other business/commercial property; (h) business/commercial and residential combination; (i) garage; and (j) other, including combination of types on one property. The remainder are considered residential. These include (a) substantial land and seasonal or other residence; (b) substantial land and trailer/mobile home; (c) seasonal/vacation house; other additional home; (d) trailer/mobile home; (e) time share ownership; (f) one single family house; (g) multiple single family houses; (h) duplex 2 unit residence; (i) triplex – 3 unit residence; (j) fourplex – 4 unit residence; (k) condominium or co-op; (l) residential, n.e.c.; (m) burial lot; and (n) miscellaneous vacation property.

Two entries are provided in the data for other real estate in 2019. If the two types are different, I compute values for residential and commercial real estate separately. If both are the same type (say, commercial), I take the one with the higher current value in 2019.

I first show overall time trends for the two variables by holding period in comparison to RORhome (see Figure 4). The annual real rate of return on other residential real estate (RORRes) and the annual real rate of return on commercial real estate (RORComm) series are more erratic over time than that for RORHome, reflecting their smaller sample sizes. However, the general time trends are similar, with a sharp downward trajectory over the first dozen years or so, followed by a modest upward trend over the next dozen years or so and then a leveling off over the remaining years.

[Figure 4 about here]

Similar patterns of cross-sectional results unfold for non-home residential real estate as for the principal residence (see Table 2). There is a moderate upward gradient in nominal and real mean and median ROR by income class in 2019. There is a more pronounced upward tilt by wealth class, with the mean real ROR ranging from a low of -6.11 percent for the bottom quintile to a high of 6.30 percent for the top percentile and the median from -1.25 percent to 2.49 percent. Holding periods generally declined with income level and rose with wealth level. Ownership rates expanded strongly with income and wealth level – from 3.5 to 64.0 percent for the former and 1.8 to 66.3 percent for the latter.

[Table 2 about here]

We once again see lower RORs for Blacks than whites though the differences are relatively modest. Likewise, we see higher RORs for Hispanics and Asians than whites (except for the Hispanic median real ROR). Holding periods were greater for whites than Blacks but the results are mixed for Hispanics and Asians. The ownership rate was highest for whites and Asians and much lower among Blacks and Hispanics.

Real and nominal RORs again generally declined with age class while housing tenure increased with age. The ownership rate rose from 3.2 percent for the youngest group, peaked at 18.1 percent for age group 55-64, and then fell off to 13.9 percent for the oldest group. The real and nominal ROR was highest among high school graduates in 2019, second highest for college graduates, followed by those with less than 12 years of schooling, and lastly those with 13-15 years of schooling. The holding period was longest for the least educated group, followed by college graduates, and then the other two schooling groups. However, the ownership rate increased sharply with educational level.

In 2019 couples enjoyed the highest ROR, followed by single females and then single males. However, single females had the longest holding period, followed by single males and then couples. The ownership rate was highest for couples, followed by single males and then single females.

4.4 Commercial Real Estate

Results are quite a bit different for other non-residential real estate. In 2019, as shown in Table 3, there is a steep gradient in returns by income level, with a particularly notable jump for the top percentile (22.60 percent mean real ROR). In contrast, the bottom wealth quintile recorded the highest mean median nominal and real ROR (their mean real ROR was 18.10 percent). Above that point the pattern is quite irregular. There were actually some extremely high and low RORs in some individual observations – such as 234.1 percent, 107.3 percent, 82.4 percent, and -36.6 percent. Holding periods tended to fall with income and advanced with wealth level. Ownership rates, not unexpectedly, progressed with both income and wealth.

[Table 3 about here]

Black Americans led the way in mean ROR but Asians were first in median nominal ROR and Hispanics first in median real ROR. Whites had the longest holding period, with Hispanics second. The ownership rate was highest for Asians, followed by whites, Hispanics, and then Blacks. There was a 4.8 percentage point differential between whites and Blacks. The

ROR was greatest for the under 35 age group but the pattern was irregular across the other age groups. However, the holding period and ownership rate rose monotonically with age.

High school graduates enjoyed the largest mean ROR but college graduates had the highest median ROR. The mean holding period declined with education but the median holding period generally advanced with schooling level. The ownership rate also progressed with schooling level. Single males in 2019 led in terms of mean ROR but couples were ahead in median ROR. The holding period was greatest for single females but couples had the highest ownership rate, followed by single males and then single females.

4.5 Regression Results

The pictures presented above based on descriptive statistics appear rather muddy with no discernible patterns except in a few instances. As a result, I next turn to a multivariate econometric analysis of the determinants of the rate of return on real property. In this analysis I control for income level, wealth level, and demographic characteristics as well as two other key factors. The first of these is the holding period of the property. As the descriptive statistics suggest, groups with shorter holding periods appear to enjoy higher returns on their real estate, *ceteris paribus,* than those that hold onto their property for longer periods of time. The econometric analysis presented below provides strong verification of this effect. Indeed, it is the second strongest variable in the analysis as measured by the t-ratio.

What are the rationales for this finding? A first reason is that those who hold their property for a shorter period of time can perhaps time the market better and make more capital gains. If a household holds the property for too long a time, it may miss out on an opportune time to sell it such as when property values peak in the local market (this is similar to stock market timing). In the extreme case, flippers (those who buy and then sell quickly) seem to do better than stayers. A second reason may be a reflection of the life cycle of communities. Families usually buy homes in a community when the community is considered desirable. However, over time communities deteriorate in terms of desirability going from high (or middle) class to lower class. This appears to be a more or less universal phenomenon except in very high-end places like Scarsdale and Beverly Hills which hold onto their relative status over long periods of time. If a family buys when a community is high class, relative capital gains go down as the community shifts over time to lower class.

A third is that real properties themselves tend to deteriorate physically over time unless there is continued maintenance and renovation. As properties deteriorate physically, their resale value likewise declines. A good analogy is hotels. Many (if not most) hotels get run down over time, and as they get shabbier, their room rates correspondingly decline. A fourth is that perhaps, property taxes go up relative to property values over time, thus lowering home values or at least the relative appreciation of home values. Several studies have reported a negative relation between property values and property taxes. The holding period will play an important role in the regression analysis reported below. As one example, the fact that Black households had a lower ROR than whites on their homes appears due in part to the fact that they may have held onto their properties for too long a period, at least in comparison to whites.

The second key factor (and the most important in terms of t-value) is the change in the overall price levels of homes over the period of interest. That is to say, timing is very important in terms of buying when overall property values are low and holding onto them as overall property values go up and, in particular, as they tend to peak. Families that buy over these periods tend to do better in terms of accrued capital gains than families that buy when house prices subsequently remain stagnant or go down. If a family bought a house in say 2000 and kept it until 2007 while house prices were surging, it would do very well in terms of accrued capital gains. The lower ROR on homes found for Blacks and higher ROR found for Hispanics may be due, in part, because the former bought at a bad time and the latter at a good time and the resultant house price changes over the period was relatively small for Blacks and high for Hispanics.

In the first set of regression results, shown in Table 4, the dependent variable is RORHome, the average annual real rate of return on principal homes among homeowners (in percentage points). As discussed above, this is essentially a weighted average of real rates of return among homeowners where the weights are years of occupancy. Perhaps, the most important finding is that the coefficient of net worth is positive and significant at the one percent level in the first three specifications. On the other hand, the coefficient of the income variable is negative but not statistically significant in the three specifications.

[Table 4 about here]

Another finding of note concerns the coefficient of the “Black” dummy variable. In the first specification, the coefficient is negative and significant at the five percent level. The

estimate suggests the Black homeowners had on average a 0.478 percentage point lower return on their principal home than white homeowners. When housing tenure ("Holding Period") is added as an independent variable in the second specification, the coefficient estimate drops to -0.311 and its significance level to 10 percent. Then, when RORNAR is included, the coefficient estimate, while remaining negative, becomes statistically insignificant. These results suggest that the lower returns on homes for Black compared to white homeowners reported in several previous studies cited above is due to their larger number of years of occupancy and to the fact that Black families tended to buy and remain in their property during periods when overall house prices were relatively stagnant. The dummy variable for Hispanics is positive but statistically insignificant, while the one for Asians is positive in the first specification and negative in the other two but also insignificant.

Results on age are also of interest. In the first specification, it appears that younger households experience higher returns on their property than do older ones. The coefficient on age class under 35 dummy variable is 1.502 (and significant at the one percent level) and that on the age class 75 and over dummy is -0.672 (also significant at the one percent level), with age class 65-74 the omitted category. However, when years of occupancy is included as an independent variable in Specification 2, the coefficient signs all flip, indicating that the apparent higher ROR for younger households is a result of their shorter tenure in their dwellings. In specification 3, with RORNAR included, the results indicate an almost monotonic increase in ROR with the age of the householder. The spread in ROR between the oldest and youngest age classes is 0.927 percentage points.

College graduates experience lower returns on their homes than less educated groups. Differences are significant at the one percent level. This result holds up even after controlling for holding period and RORNAR. A possible explanation is that college graduates paid too much for their homes, buying in over-priced communities and times, whereas the less educated were shrewder investors. It may also reflect the finding that house appreciation is negatively related to income level, though the result is not statistically significant. On the other hand, single males and single females do less well on their housing investments than married couples. Holding period, as noted above has a negative effect on the rate of return. This is a highly significant variable,

with t-statistics of 25.1 in Specification 2 and 12.9 in Specification 3. RORNAR has a positive effect on ROR and has the highest t-value of 21.4 in Specification 3.[10]

It is possible that the wealth gradient is non-linear. In specification 4, net worth is divided into quantile groupings and a dummy variable for each group (except the omitted category, the bottom quintile) is used in the new regression. The spread is not insubstantial. The difference in ROR between the top percentile and the second quintile is 2.08 percentage points and that between the top percentile and the middle quintile is 0.56 percentage points. Other results are similar to specification 3 except that the coefficient of income is now zero (but again insignificant); the pattern for the age class coefficients remains irregular and only one of these is statistically significant (at the ten percent level); and of the family type dummy variables, only one is significant (at the ten percent level).

In specification 5, ln(net worth) is used instead of the dollar value of net worth. This is also a non-linear form for net worth and is the preferred specification with the highest R^2 (and adjusted R^2). The coefficient of ln(net worth) remains significant at the one percent level. Its coefficient value of 0.189 can be interpreted as an elasticity and indicates that for every one percent increase in net worth, the rate of return on homes rises by 0.189 percentage points. The coefficient of income remains positive but insignificant. The coefficient of the Black dummy variable now turns positive and significant at the ten percent level. Its coefficient value indicates that Black homeowners enjoy a 0.358 percentage point premium on their rate of return. None of the coefficient of the age dummy variables is significant now. The three coefficients of the education dummy variables remain positive and significant at the one percent level, while the coefficients of the two family type variables become negative and insignificant. While almost all homeowners have positive net worth, a small number were "underwater" with mortgage debt greater than home value. As a result, the sample size is reduced by 3.0 percent.

It is also of interest to interpret the coefficient values for the holding period and RORNAR. Their coefficient values are very robust across specifications 3 to 5. According to Specification 5, the coefficient of holding period now has a t-statistic of 12.9 and each year of

[10] In the regressions, the value of RORNAR is based on the holding period that corresponds to the actual holding period for the home owned by the household as reported in the SCF data. As noted above the series begins in 1971. The maximum holding period allowed in the SCF data is 60 years (from a purchase date of 1959). I assume that the value of RORNAR for 1959 to 1970 is the same as its value in 1971. As is evident from Figure 1, RORNAR flattens out after about 40 years. In any case, this approximation applies to only 3.45 percent of the observations in the sample – that is, only 3.45 percent of homeowners in 2019 occupied their home for more than 48 years.

home tenure reduces the ROR by 0.065 percentage points. Thus, a 50-year holding period diminishes the ROR by a quite substantial 3.23 percentage points. The coefficient of RORNAR is now 0.944 with a t-statistic of 21.5. This result indicates that a one percentage point increase in the economy-wide ROR on homes translates into an almost one percentage point increase in that enjoyed by the individual homeowner.

One other variant is shown in Specification 6 in which the net worth term is excluded. The coefficient value of income is a positive 0.070 and it is now significant at the ten percent level. These results imply that higher income households do enjoy higher returns on their homes when net worth is not considered. However, the net worth effect so dominates the income effect that when the former is included in the specification, the coefficient of income turns insignificant. Interestingly, in this case, the coefficient on the Black dummy variable is now negative and significant at the ten percent level. The three age dummy variables also become significant and indicate that older homeowners enjoy higher returns on their homes than do younger ones. The coefficients of the three education dummy variables remain positive and significant at the one percent level, while those for single males and single females remain negative but are now significant at the one percent level. The coefficients of the holding period and RORNAR remain largely unchanged.

Regression results are not as robust for returns on non-home real estate and commercial real estate. In Table 5, the dependent variable is RORRes, the average annual real rate of return on non-principal home residential real estate in percentage points among property owners, based on accrued capital gains. In Specification 1, the most notable result is that relative to the omitted age group 65-74, the youngest age group has the highest returns on non-home residential real estate. Returns are significantly lower for the other age groups, particularly age group 75 and over. High school graduates record significantly higher ROR than the other educational groups, while single males have a lower return than single females or couples. However, the R^2 and adjusted R^2 statistics are extremely low.

[Table 5 about here]

When years of occupancy is added as an independent variable in Specification 2, results on age shift. Age group 65-74 now has the highest returns, followed in order by age group 75 and over, age group 55-64, age group 45-54, and then age group 35-44. The coefficient of age group under 35 is now statistically insignificant. High school graduates still have an ROR

significantly above the other schooling groups and single males an ROR significantly below the other two family types. The coefficient of holding period is again negative and significant at the one percent level (with a t-statistic of 15.7). The magnitude of the coefficient is considerably higher here than for RORHome. A one-year increase in years of occupancy is now associated with a 0.278 percentage point reduction in the rate of return.

Results remain largely unchanged when the NAR median house price variable is included in Specification 3. This variable here is not significant, suggesting that the market for second homes and rental real estate is based on different factors than that for primary residences and its price appears to be determined independently of that of primary residences. The t-statistic of the holding period now drops slightly to 14.6. The coefficient of income is negative in the first specification and positive in the other two but not significant, while that of wealth is negative in all three but also not significant. It is also of note that the coefficient of the Black dummy variable is negative and those of Hispanic and Asians are positive across the three specifications but none of these coefficients is statistically significant.

In Table 6, the dependent variable is RORComm, the average annual real rate of return on commercial real estate among property owners based on accrued capital gains in percentage points. In Specification 1, the most telling result is that relative to the omitted age group 65-74, age group under 35 records the highest coefficient, a value of 8.34, significant at the one percent level. Coefficients are also positive and significant for age groups 45-54 and 55-64. Those with 1 to 3 years of college record a significantly lower ROR than the other educational groups. When the holding period is added as an independent variable in Specification 2, the coefficient of age group under 35 remains positive and significant at the one percent level but the coefficient value drops to 4.94. The coefficient of age group 55-64 remains positive but its significance level falls to five percent, while that of age group 45-54 becomes insignificant. The coefficient of age group 35-44 is now negative and significant at the ten percent level. The coefficient for those with 1-3 years of college remains negative and significant. Holding period once again has a negative and highly significant coefficient, with a t-value of 9.56. Its coefficient value is also quite substantial, indicating that each additional year of holding onto the property reduces the annual rate of return by 0.304 percentage points.

[Table 6 about here]

Finally, including the NAR median house price variable in specification 3 changes some of the results, while its coefficient is actually negative but not significant. Now the coefficient of the Hispanic dummy variable is negative and significant at the five percent level, that of age group under 35 is now insignificant, and that of age group 75 and over is now positive and significant at the five percent level. Other changes are that the coefficient of those with less than a high school degree is negative and significant at the ten percent level and that for single males also negative and significant at the ten percent level. The coefficient of holding period remains highly significant, with a slightly lower t-value of 9.01. The coefficient of income is positive across all specifications but not significant, while that of wealth is negative but not significant. In this case the coefficient of the Black dummy variable is positive in the first two specifications and negative in the third but again not significant, while that of the Asian dummy variable is positive but not significant.

The next part of the analysis considers the sensitivity of the regression results on RORhome to alternative restrictions on the holding period. It is likely that there is considerable volatility in rates of return over short periods of time. Limiting the analysis to longer periods of time may therefore improve the reliability of the results. In Table 7, I consider holding periods of two years or more, three years or more, and five years or more. Perhaps, the most notable finding is that the wealth effect becomes more powerful as the holding period is restricted, with the coefficient value of net worth rising over the four forms from 0.022 (in the base case) to 0.027 in the fourth variant (a holding period of five years or more) and the t-statistic from 3.47 to 7.50. The coefficient value of income, on the other hand, remains negative and insignificant in the four versions.

[Table 7 about here]

The coefficient of the dummy variable for Black households inflates from -0.240 in the base case to -0.242, -0.416, and then to -0.726 and it is transformed from being insignificant in the base case to being significant at the one percent level in the last two cases. Likewise, the coefficient of the Hispanic dummy variable is magnified almost five times, from 0.131 to 0.618, and changes from being insignificant in the base case to being significant at the one percent level in the other three cases.

Why the turnaround in results? One possibility is that by restricting the holding period I am also lopping off the most recent years of data. It is conceivable that time trends in house

prices were different after, say, 2014 than before. Second, as noted above, there is strong evidence that that whites, Blacks Asians, and Hispanics have significant differences in geographic distribution of residence and as Case and Shiller (1989) show there is substantial geographic dispersion in such rates of return. It is likely that Hispanics are more concentrated in Western states and in particular the "sand states" such as California, Arizona, New Mexico, and Florida, while Blacks are more concentrated in the South, Northeast, and Midwest. Differences in house price appreciation between these areas might explain the negative coefficient found for Black homeownership and the positive coefficient for Hispanic homeownership. In addition, these differences might have been stronger before 2014 or so than after.

A third consideration in the case of Black homeownership is the effect of so-called "redlining" and other impediments to Black homeownership. These obstacles will, of course, lower the current value of properties owned by Black households since the demand for these homes will be smaller. However, redlining also means that Blacks are likely to pay less than comparable homes in white neighborhoods, so that the appreciation in percentage terms of house values could be about the same. It seems possible that over the long haul (after say, five years of home tenure), the current value effect comes to dominate the purchase price effect. In other words, the cumulative effect of redlining suppresses house price appreciation more than it lowers the purchase price of the property.

The age coefficients generally rise with age in the base case but they are quite irregular in the other three cases. The coefficients of the education dummy variables remain significant at one percent level in all four cases but coefficient values tail off across the four cases. The coefficients for the single males and single females dummy variables remain negative across the four cases. The single males coefficient dwindles over the four versions and changes from being significant at one percent level in the first two to being significant at the five percent level in the third, and insignificant in the last. That for single females remains significant at the one percent level in all four cases, but there is no clear pattern with regard to its magnitude. The coefficient of the holding period remains negative and significant at the one percent level in all four cases. However, its magnitude wanes from -0.066 to -0.018 and its t-statistic from 12.87 to 5.76. This result, however, may simply be due to the fact that I am truncating the holding period through successive iterations of the regression analysis. The coefficient of RORNAR generally falls over

the four forms, from 0.947 in the base case to 0.899 in the fourth case but its t-statistic climbs from 21.42 to 37.46.

A similar analysis was conducted for RORRes and RORComm. The results (not shown) are not materially changed from the base results. In the case of RORRes, it is of interest that the R^2 and adjusted R^2 statistics actually weaken as the holding period restriction is diminished from zero years (the base case) to five years (from 0.0420 to 0.0319 in the case of the latter). The coefficient of the holding period remains negative and significant at the one percent level in all four cases. However, its magnitude decreases in absolute value from -0.279 in the base case to -0.097 in the case when the holding period is limited to five or more years and its t-value from 15.7 to 9.59.

With regard to RORComm, there is no clear pattern over the four variants with regard to the R^2 or adjusted R^2 statistics. As before, the coefficient of the holding period remains negative and significant at the one percent level in all four cases. However, its magnitude fades away in absolute value from -0.304 in the base case to -0.089 in the case when the holding period is limited to five or more years and its t-value from 9.59 to 3.19.

4.6 Effects on Wealth Inequality

The final piece of analysis investigates the effects of differential rates of return on homes on overall wealth inequality. The analysis is based on the values of RORHome calculated directly from the underlying SCF data. I speculated above that higher returns on homes among the wealthy should lead to increasing wealth inequality because their homes would appreciate at a higher rate than less wealthy households. Here, I apply the RORHome value to the value of homes one year out, two years out, and five years out. Technically,

$$W_t = W_0 + HOME \cdot e^{(RORHome \cdot t)} - HOME$$

where W_t is projected new worth in year t, W_0 is initial wealth (in year 2019), and HOME is the value of the home in the initial year.

Results, shown in Table 8, indicate not surprisingly that mean and median household wealth would increase over time. Mean wealth among all households would rise by 4.0 percent over one year, 6.2 percent over two years, and 18.3 percent over five years. Median wealth increases even more, by 11.7 percent, 17.9 percent, and 39.3 percent, respectively. Percentage gains would be somewhat greater among homeowners alone. However, surprisingly, the calculations indicate that wealth inequality as measured by the Gini coefficient would decrease

over time instead of rising. Over five years, the Gini coefficient among all households would drop by 0.015 and that among homeowners by an even greater 0.029.

[Table 8 about here]

Further investigation provides an explanation for this seemingly counter-intuitive result that RORhome is equalizing despite the fact that RORHome is greater for the wealthier. As shown in Table 9, both the homeownership rate and the mean value of homes increases sharply by wealth class. Moreover, there is an upward gradient in ROHome by wealth class. However, the key point is that the share of homes in total net worth also declines steeply by wealth class. As a result, the percentage gain in net worth from augmenting home values by RORhome among homeowners actually declines by wealth class. That is why the Gini coefficient actually goes down after this adjustment. One would need a very steep upward gradient in RORHome by wealth class to offset the negative correlation between the share of homes in net worth and wealth level on overall inequality.[11]

[Table 9 about here]

5. Concluding Remarks

Perhaps the most notable finding from the multivariate regression analysis on RORhome is that there is a positive and statistically significant effect of household wealth on the rate of return on principal homes. A similar finding is reported by Sakong (2022) who finds that returns on homes are increasing in net worth, though the methodology used is completely different. The effect is strong here. The spread in RORHome between the top percentile and the second quintile, with controls for holding period and overall house price movements, is 2.08 percentage points and that between the top percentile and the middle quintile is 0.56 percentage points (Specification 4). The elasticity of RORHome with respect to net worth is 0.189, indicating that for every one percent increase in net worth, the rate of return on homes rises by 0.189 percentage points (Specification 5). On the other hand, there is no statistically significant relation between household income and rates of return on principal dwellings.

What might explain the findings for the wealth effect? The most salient explanation is that it might be a reflection of the increasing concentration of wealth and, indeed, of the rising profit share in the U.S. economy. As Lettau et. al. (2019) and Greenwald et. al. (2021) find, the

[11] The results reported in Tables 8 and 9 are quite similar when RORHome is estimated from regression Specification 5 in Table 4 instead of directly calculated from the SCF data.

rise in the profit share in the U.S. has translated into a higher concentration of wealth and this has helped fuel the stock market, leading to higher returns on the stock portfolio. The increasing concentration of wealth over time also implies that more money is chasing high-end properties, driving up house prices at the top. The same seems to true for art work. This would imply that more expensive (and exclusive) residential areas will have higher house appreciation over time.

Of course, it is possible that the greater demand for high end properties might lead to more building of these properties. However, it is well known that high-end places are subject to restrictive zoning regulations which prevent many new homes or residential units from being built (such as in Manhattan, San Francisco, and the like). Rich homes tend to be in exclusive areas with limited ability to expand the supply. The price of rich homes tends to track with golf club membership admission fees. Golf clubs have the same problem – limited ability to expand supply. In contrast, for the middle class, it is possible to build a considerable number of new homes in Texas, for example, if the demand for such homes increases (there is plenty of land still available); this keeps price house appreciation down.

Another important finding is that while the coefficient on the dummy variable for Black households is negative and significant without controls for holding period and overall house price movements, it becomes insignificant once these controls are put into place. Indeed, in my preferred specification (Specification 5), the coefficient on the Black dummy variable is positive and significant at the 10 percent level. These results suggest that the lower returns on homes for Black compared to white homeowners reported in many previous studies cited above is due to their larger number of years of occupancy and to bad timing with regard to overall house price movements. One may wonder about the effects of redlining and discrimination against Blacks in general. Though this likely lowers the resale value of homes owned by Black families, it also lowers the purchase price. The two effects may at least partly offset each other in terms of house price appreciation.

Results on age are also of interest. Without controls for holding period and overall house price movements, it appears that younger households experience higher returns on their property than do older ones. However, when years of occupancy is included as an independent variable, the coefficient signs all flip, indicating that the apparent higher return for younger households is a result of their shorter homeowner tenure. With overall house price movements added, the results indicate an almost monotonic increase in returns with the age of the householder. The

spread in annual returns between the oldest and youngest age group is a substantial 0.927 percentage points.

Another notable finding is that years of occupancy has a negative and highly significant effect on the rate of return. According to my preferred estimate, each year of home tenure reduces the ROR by 0.071 percentage points. Thus, a 50-year holding period diminishes the ROR by 3.53 percentage points, which is also quite substantial.

What are the rationales for this result? A first possibility is that those who hold their property for a shorter period of time can perhaps time the market better and make more capital gains. If a household holds the property for too long a time, it may miss out on an opportune time to sell. A second possibility is that communities themselves go through a life-cycle, from more desirable to less desirable. If a family buys when a community is high class, property values may go down as the community shifts over time to lower class. A third possibility is that real properties themselves tend to deteriorate physically over time unless there is continued maintenance and renovation. As properties deteriorate physically, their resale value likewise declines.

A further result of interest is that overall house price movements have a positive and highly significant effect on property rates of return. That is to say, timing is very important in terms of buying when overall property values are low and holding onto them as overall property values go up. Families that buy over these periods tend to do better in terms of accrued capital gains than families that buy when house prices subsequently remain stagnant or go down. According to my preferred estimate, the coefficient of RORNAR is 0.944, indicating that a one percentage point increase in the economy-wide rate of return on homes translates into an almost one percentage point increase in that experienced by the individual homeowner.

In contrast the rate of return on non-principal home residential real estate and commercial real estate appears insensitive to the income or wealth level of the household. However, as with the principal home, the holding period exerts a highly significant negative effect on the rate of return. On the other hand, overall house price movements do not seem to affect returns on non-primary residences, suggesting that the market for second homes is separate from that for primary residences.

It is also found, counter-intuitively, that differentials in rates of return on homes, even though they favor the wealthy, reduce wealth inequality rather than exacerbating it. The

explanation is that the share of homes in net worth is much greater for the less wealthy that the percentage increase in net worth from augmenting home values by its rate of return is correspondingly bigger.

References

Aaronson, Daniel, Daniel A. Hartley, and Bhashkar Mazumder (2020), "The Effects of the 1930s HOLC 'Redlining' Maps," Working Paper WP-2017-12. Federal Reserve Bank of Chicago.

Anacker, Katrin B. (2010), "Still Paying the Race Tax? Analyzing Property Values in Homogeneous and Mixed-Race Suburbs," *Journal of Urban Affairs*, 32(1): pp.55–77.

Bach, Laurent, Laurent E. Calvet, and Paolo Sodini (2020), "Rich Pickings? Risk, Return, and Skill in Household Wealth," *American Economic Review*, 110(9): pp. 2703–47.

Patrick Bayera, Marcus Casey, Fernando Ferreira, and Robert McMillan (2017), "Racial and Ethnic Price Differentials in the Housing Market," *Journal of Urban Economics*, 102: pp. 91–105.

Benhabib, Jess, Alberto Bisin and Mi Luo (2017), "Earnings Inequality and Other Determinants of Wealth Inequality," *American Economic Review* 107(5), pp. 593–597.

Benhabib, Jess, Alberto Bisin and Mi Luo (2019), "Wealth Distribution and Social Mobility in the US: A Quantitative Approach," *American Economic Review* 109(5), pp. 1623–1647.

Benhabib, Jess, Alberto Bisin and Shenghao Zhu (2011), "The Distribution of Wealth and Fiscal Policy in Economies with Finitely-Lived Agents," *Econometrica* 79(1), pp. 123–157.

Blau, Francine D., and John W. Graham (1990), "Black-White Differences in Wealth and Asset Composition," *Quarterly Journal of Economics*, 105, pp. 321–339.

Blume, Marshall, Jean Crockett, and Irwin Friend (1974), "Stockownership in the United States: Characteristics and Trends," *Survey of Current Business*, Vol. 54, No. 11, pp. 16-40.

Bricker, Jesse, Jacob Krimmel, Alice Henriques, and John Sabelhaus (2016), "Measuring Income and Wealth at the Top Using Administrative and Survey Data," *Brookings Papers on Economic Activity,* Spring, pp. 261-312.

Campbell, John Y., Tarun Ramadorai and Benjamin Ranish (2019), “Do the Rich Get Richer in the Stock Market? Evidence From India,” *American Economic Review: Insights*, 1(2): pp. 225–240

Case, Karl E., and Robert J. Shiller (1989), “The Efficiency of the Market for Single-Family Homes,” *American Economic Review* 79 (1), pp. 125–137.

Denton, Nancy A. (2001), “Housing as a Means of Asset Accumulation: A Good Strategy for the Poor?” in Shapiro, Thomas M., and Edward N. Wolff, (eds), *Assets for the Poor: The Benefits of Spreading Asset Ownership*. Russell Sage Foundation, New York.

Faber, Jacob W., and Ingrid Gould Ellen (2016), “Race and the Housing Cycle: Differences in Home Equity Trends Among Long-Term Homeowners,” *Housing Policy Debate*, 26(3), pp. 456–473 at http://dx.doi.org/10.1080/10511482.2015.1128959

Fagereng, Andreas, Luigi Guiso, Davide Malacrino, and Luigi Pistaferri (2016), “Heterogeneity in Returns to Wealth and the Measurement of Wealth Inequality,” *American Economic Review,* 106(5), pp. 651-655.

Fagereng, Andreas, Luigi Guiso, Davide Malacrino, and Luigi Pistaferri (2020), “Heterogeneity and Persistence in Returns to Wealth,” *Econometrica*, 88(1): pp. 115–170.

Feldstein, Martin, and Shlomo Yitzhaki (1982), "Are High Income Individuals Better Stock Market Investors?" NBER Working Papers 0948.

Flippen, Chenoa (2004), “Unequal Returns to Housing Investments? A Study of Real Housing Appreciation Among Black, White, and Hispanic Households,” *Social Forces*, 82(4): pp. 1523–1551.

Greenwald, Daniel L., Martin Lettau, and Sydney C. Ludvigson (2021), “How the Wealth Was Won: Factor Shares as Market Fundamentals,” unpublished paper, April 8, 2021 version.

Ihlanfeldt, Keigh R. and Tom Mayock (2009), “Price Discrimination in the Housing Market. *Journal of Urban Economics*,” 66(2): pp. 125–140.

Johnson, Barry, Brian Raub, and Joseph Newcomb (2013), ‘‘A New Look at the Income-Wealth Connection for America’s Wealthiest Decedents,’’ IRS Statistics of Income Working Paper Series.

Kahn, Matthew E. (2021), “Racial and Ethnic Differences in the Financial Returns to Home Purchases From 2007 to 2020,” NBER Working Paper 28759, May.

Kartashova, Katya, and Xiaoqing Zhou (2021), ”Wealth Inequality and Return Heterogeneity during the COVID-19 Pandemic”, unpublished manuscript, October.

Kennickell, Arthur B., and R. Louise Woodburn (1999), "Consistent Weight Design for the 1989, 1992, and 1995 SCFs, and the Distribution of Wealth," *Review of Income and Wealth* 45(2): pp. 193-216.

Kermani, Amir, and Francis Wong (2022), “Racial Disparities in Housing Returns,” unpublished paper, February 14.

Lepinteur, Anthony, and Sophie R. Waitl (2021), “Tracking Owners’ Sentiments: Subjective Home Values, Expectations, and House Price Dynamics, LISER Working Paper No. 2021-02, February.

Lettau, Martin, Sydney C. Ludvigson, and Sai Ma (2019), “Capital Share Risk in U.S. Asset Pricing,” *The Journal of Finance* 74(4): pp. 1753-1792.

Myers, Caitlin Knowles (2004), “Discrimination and Neighborhood Effects: Understanding Racial Differentials in US Housing Prices,” *Journal of Urban Economics*, 56(2): pp. 279–302.

Oliver, Melvyn L., and Shapiro, Thomas (2006), *Black wealth/white wealth: A new perspective on racial inequality*, New York, NY: Taylor and Francis.

Perry, Andre, Jonathan Rothwell, and David Harshbarger (2018), “The Devaluation of Assets in Black Neighborhoods: The case of residential property,” Metropolitan Policy Program at Brookings, November, available at https://www.brookings.edu/wp-content/uploads/2018/11/2018.11_Brookings-Metro_Devaluation-Assets-Black-Neighborhoods_final.pdf.

Prottoy, A. Akbar, Sijie Li, Allison Shertzer, and Randall P. Walsh (2019), “Racial Segregation in Housing Markets and the Erosion of Black Wealth,” NBER Working Paper 25805, May.

Saez, Emmanuel and Gabriel Zucman (2016), “Wealth Inequality in the United States since 1913: Evidence from Capitalized Income Tax Data,” *Quarterly Journal of Economics* 131(2): pp. 519-578.

Sakong, Jung (2022), “Cyclical Housing Transactions and Wealth Inequality.” Federal Reserve Bank of Chicago Working Paper WP 2022-05, January 26, 2022, at https://doi.org/10.21033/wp-2022-05.

Wolff, Edward N. (1987), "Estimates of Household Wealth Inequality in the United States, 1962-83," *Review of Income and Wealth* 33(3): pp. 231-256.

Wolff, Edward N. (2017), *A Century of Wealth in America*, Cambridge, MA: Harvard University Press.

Wolff, Edward N. (2022), "African-American and Hispanic Income, Wealth and Homeownership since 1989," *Review of Income and Wealth* 68(1): pp. 189-233; Available on-line at: https://onlinelibrary.wiley.com/doi/10.1111/roiw.12518.

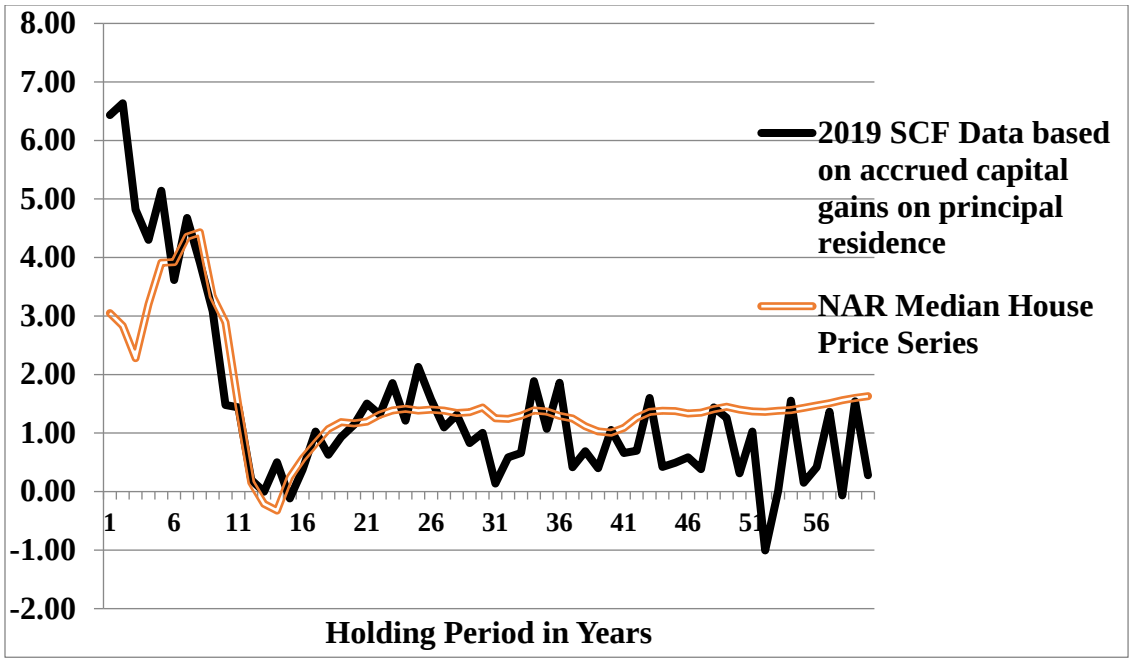

Figure 1. Annual Real Rate of Return on Homes by Holding Period
[Source: Author's calculations from the 2019 SCF and the National Association of Realtors, "Median Sales Price of Existing Single-Family Homes for Metropolitan Areas," (see footnote 3 for sources)].

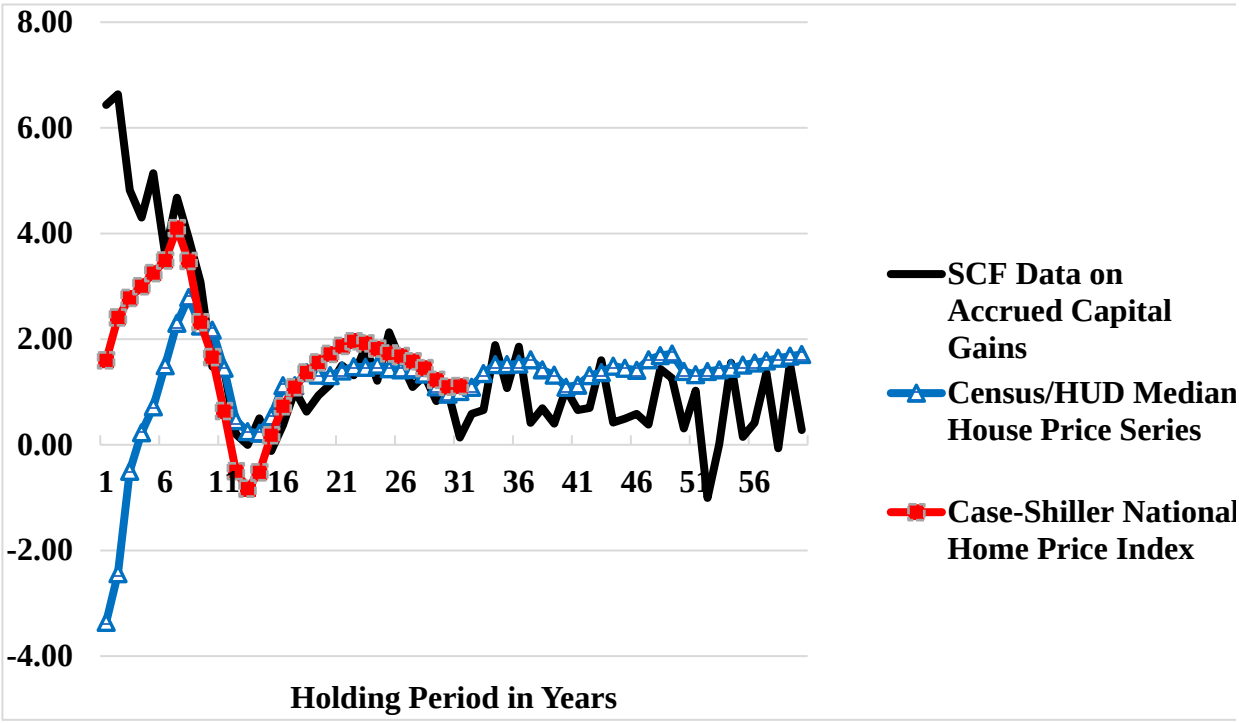

Figure 2. Annual Real Rate of Return on Homes by Holding Period: Second Comparison
[Source: Author's calculations from the 2019 SCF and the Census/HUD Median House Price Series, and the Case-Shiller National Home Price Index (see footnotes 4 and 5 for sources).]

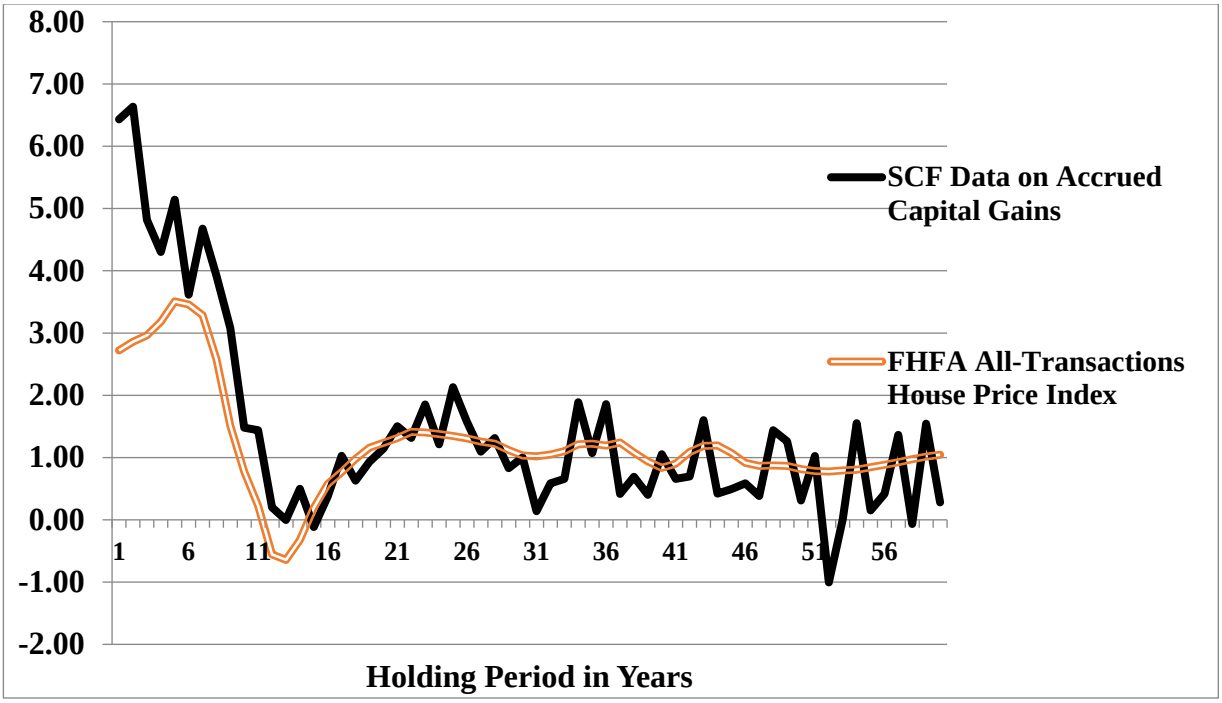

Figure 3. Annual Real Rate of Return on Homes by Holding Period: Third Comparison
[Source: Author's calculations from the 2019 SCF and the Federal Housing Finance Agency (FHFA)
All-Transactions House Price Index for the United States [USSTHPI] (see Footnote 6 for data source.)

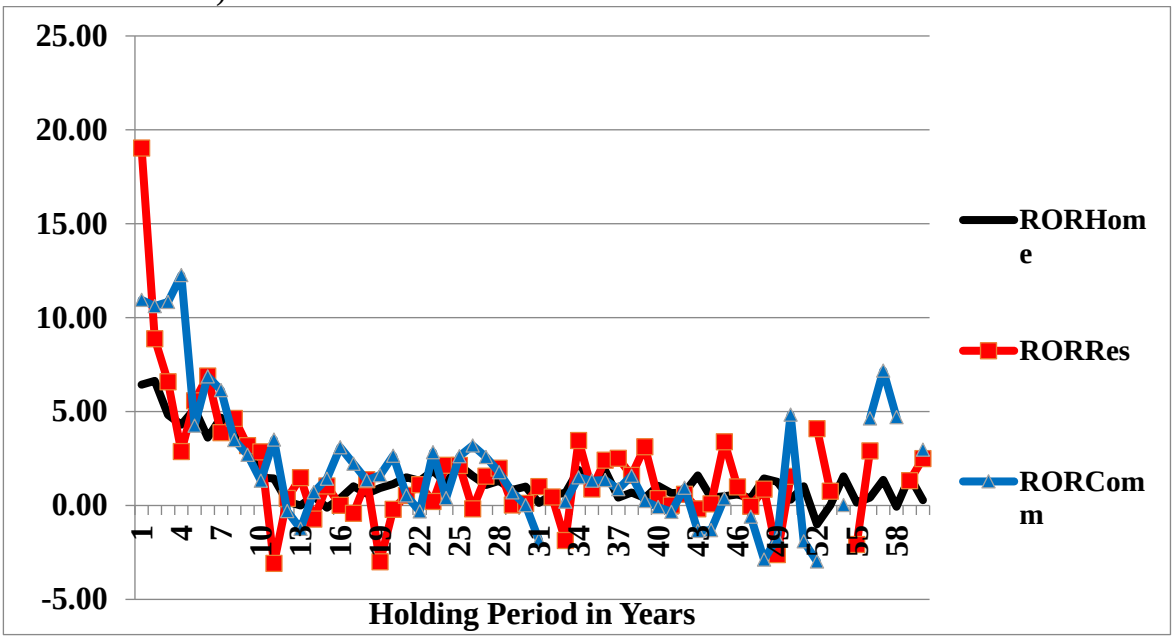

Figure 4. Annual Real Rate of Return on Homes, Other Residential Real Estate, and Commercial Real Estate
[Source: Author's calculations from the 2019 SCF]

Table 1. Annual rate of return on owner-occupied housing (principal residence only) among homeowners, based on accrued capital gains, 2019

	Nominal Rate of Return [%]		Real Rate of Return[d] [%]		Holding Period (years)		Homeownership Rate [%]		Sample
	Mean	Median	Mean	Median	Mean	Median	All Homes	Restricted	Size
All Households	4.73	3.45	2.65	1.20	15.5	12.0	64.9	60.7	3632
A. Income Level									
Bottom quintile	4.94	3.22	2.63	0.86	22.4	19.0	37.3	30.6	245
Second quintile	5.23	3.32	3.03	0.89	19.2	15.0	53.3	47.4	379
Middle quintile	4.81	3.53	2.67	1.27	16.6	13.0	64.2	59.7	474
Fourth quintile	4.47	3.48	2.47	1.31	13.1	10.0	78.2	75.4	688
P80-P90	4.81	3.65	2.82	1.52	12.5	9.0	87.0	85.1	471
P90-P95	4.41	3.11	2.46	1.09	12.3	10.0	92.7	92.5	305
P95-P99	4.20	3.48	2.26	1.61	12.4	10.0	94.3	93.5	432
Top one percent	4.44	3.77	2.46	1.58	13.8	11.0	96.9	95.7	638
B. Wealth Level									
Bottom quintile	4.29	2.35	2.40	0.51	5.3	2.0	18.1	16.5	108
Second quintile	4.31	2.50	2.31	0.54	10.9	6.0	35.6	28.1	215
Middle quintile	5.37	3.24	3.29	1.07	14.8	11.0	84.0	78.2	591
Fourth quintile	4.51	3.56	2.38	1.18	17.8	14.0	92.1	88.3	752
P80-P90	4.77	3.63	2.67	1.41	17.4	14.0	93.2	90.6	496
P90-P95	4.24	3.69	2.15	1.59	17.2	15.0	97.8	95.3	333
P95-P99	4.55	3.78	2.48	1.63	16.7	14.0	93.6	91.0	471
Top one percent	5.20	4.30	3.21	2.17	15.6	14.0	97.1	95.6	666
C. Race									
Non-Hispanic whites	4.77	3.47	2.69	1.19	15.8	12.0	72.8	67.5	2902
Non-Hispanic Blacks	4.16	2.70	2.02	0.40	17.4	13.0	44.0	42.0	279
Hispanics[a]	5.08	4.24	3.06	2.15	13.1	9.0	47.3	45.5	247
Asian and other races	4.76	3.78	2.78	1.67	11.1	7.0	62.1	59.1	203

D. Age Class[b]									
Under 35	**5.88**	**4.17**	**4.01**	**2.45**	**3.4**	**2.0**	**36.2**	**33.3**	**202**
35-44	**5.65**	**3.65**	**3.80**	**1.68**	**6.4**	**5.0**	**61.4**	**59.0**	**505**
45-54	**4.97**	**3.45**	**3.06**	**1.55**	**11.7**	**11.0**	**69.7**	**65.8**	**753**
55-64	**4.43**	**3.19**	**2.39**	**1.11**	**16.3**	**16.0**	**74.1**	**69.0**	**952**
65-74	**4.10**	**3.24**	**1.87**	**0.83**	**22.3**	**21.0**	**78.4**	**72.1**	**779**
75 & over	**3.83**	**3.50**	**1.22**	**0.71**	**30.6**	**30.0**	**82.4**	**76.6**	**441**
E. Education[c]									
Less than 12 years	**4.92**	**3.87**	**2.62**	**0.95**	**22.0**	**17.0**	**51.0**	**42.2**	**199**
12 years	**4.80**	**3.37**	**2.64**	**1.03**	**17.4**	**14.0**	**61.0**	**54.6**	**620**
13-15 years	**5.12**	**3.61**	**3.04**	**1.30**	**15.9**	**13.0**	**60.6**	**56.4**	**756**
16 years of more	**4.43**	**3.28**	**2.42**	**1.24**	**13.2**	**10.0**	**75.1**	**73.6**	**2056**
F. Family type									
Couples	**4.89**	**3.58**	**2.84**	**1.38**	**14.2**	**10.0**	**76.8**	**72.4**	**2699**
Single males	**4.61**	**3.19**	**2.54**	**0.96**	**15.3**	**11.0**	**47.3**	**44.0**	**394**
Single females	**4.31**	**3.09**	**2.11**	**0.86**	**19.9**	**16.0**	**51.4**	**46.8**	**539**

Note: author's computations from the 2019 SCF.

Computations of rates and return and holding periods exclude mobile homes, farm dwellings, and ranches.

The restricted home ownership rate excludes mobile homes, farm dwellings, and ranches.

a. Hispanics can be of any race.

b. Households are classified according to the age of the head of household.

c. Households are classified according to the education of the head of household.

d. The real rate of return is defined as the nominal return less the average annual rate of change of the CPI. The CPI-U-RS is used for years 1977 onward. The CPI-U is used for earlier years. The average annual price change is defined as the arithmetic average of the annual logarithmic change in prices over the relevant period.

Table 2. Annual Rates of return on other (non-principal-home) residential real estate among owners, based on accrued capital gains, 2019

	Nominal Rate of Return [%]		Real Rate of Return[d] [%]		Holding Period (years)		Other (non-home) Residential Real Estate Ownership Rate	Sample Size
	Mean	Median	Mean	Median	Mean	Median		
All Households	5.56	3.25	3.58	1.11	13.0	10.0	12.5	1232
A. Income Level								
Bottom quintile	4.87	2.05	2.87	-0.03	14.4	13.0	3.5	42
Second quintile	5.66	3.34	3.59	0.41	16.7	13.0	4.8	40
Middle quintile	6.39	2.47	4.33	0.31	14.7	11.0	8.0	82
Fourth quintile	5.27	2.74	3.29	0.60	13.4	11.0	14.6	150
P80-P90	5.26	3.86	3.25	1.83	13.1	9.0	22.9	141
P90-P95	5.36	3.04	3.43	1.38	10.7	6.0	27.6	107
P95-P99	5.70	3.83	3.78	1.77	11.3	9.0	48.5	227
Top one percent	6.49	4.05	4.56	1.88	10.2	7.0	64.0	441
B. Wealth Level								
Bottom quintile	-4.27	0.33	-6.11	-1.25	8.4	6.0	1.8	16
Second quintile	3.42	0.75	1.44	-1.26	11.9	10.0	2.3	22
Middle quintile	4.88	2.76	2.95	0.68	12.2	10.0	7.5	64
Fourth quintile	6.02	2.90	4.01	0.52	13.5	10.0	14.7	138
P80-P90	6.40	3.34	4.41	0.96	13.4	11.0	26.7	144
P90-P95	5.25	3.83	3.24	1.46	13.8	10.0	35.8	125
P95-P99	5.90	4.43	3.89	2.07	13.6	11.0	52.9	253
Top one percent	8.24	4.43	6.30	2.49	10.9	7.0	66.3	470
C. Race								
Non-Hispanic whites	5.44	3.38	3.43	1.15	13.2	10.0	14.0	1034
Non-Hispanic Blacks	5.18	2.53	3.25	0.45	11.5	9.0	8.0	62
Hispanics[a]	6.42	3.07	4.46	0.92	13.2	12.0	8.6	63
Asian and other races	6.64	4.14	4.72	2.27	12.9	11.0	14.6	73

D. Age Class[b]								
Under 35	**9.06**	**6.24**	**7.31**	**4.66**	**4.6**	**5.0**	**3.2**	**24**
35-44	**3.57**	**2.60**	**1.72**	**0.68**	**9.1**	**8.0**	**10.0**	**114**
45-54	**5.29**	**3.13**	**3.42**	**1.10**	**10.2**	**10.0**	**15.5**	**271**
55-64	**6.33**	**3.36**	**4.38**	**1.35**	**11.5**	**8.0**	**18.1**	**366**
65-74	**5.57**	**2.79**	**3.44**	**0.55**	**17.9**	**15.0**	**16.7**	**299**
75 & over	**5.12**	**4.14**	**2.88**	**1.68**	**21.2**	**19.0**	**13.9**	**158**
E. Education[c]								
Less than 12 years	**5.36**	**3.38**	**3.26**	**1.34**	**17.4**	**15.0**	**6.7**	**43**
12 years	**7.22**	**4.08**	**5.22**	**2.19**	**12.3**	**9.0**	**8.4**	**139**
13-15 years	**4.29**	**2.47**	**2.35**	**0.37**	**11.9**	**9.0**	**10.2**	**195**
16 years of more	**5.65**	**3.40**	**3.66**	**1.34**	**13.3**	**11.0**	**18.7**	**855**
F. Family type								
Couples	**6.00**	**3.57**	**4.03**	**1.46**	**12.3**	**10.0**	**17.0**	**1034**
Single males	**2.96**	**2.28**	**0.99**	**0.02**	**13.4**	**11.0**	**7.7**	**97**
Single females	**5.24**	**2.34**	**3.13**	**0.16**	**17.1**	**14.0**	**6.2**	**102**

Note: author's computations from the 2019 SCF.
See text for details on the definition of other residential real estate.
a. Hispanics can be of any race.
b. Households are classified according to the age of the head of household.
c. Households are classified according to the education of the head of household.
d. The real rate of return is defined as the nominal return less the average annual rate of change of the CPI. The CPI-U-RS is used for years 1977 onward.
The CPI-U is used for earlier years.
The average annual price change is defined as the arithmetic average of the annual logarithmic change in prices over the relevant period.

Table 3. Annual Rates of return on commercial real estate among owners, based on accrued capital gains, 2019

	Nominal Rate of Return [%]		Real Rate of Return[d] [%]		Holding Period (years)		Commercial Real Estate Ownership Rate	Sample Size
	Mean	Median	Mean	Median	Mean	Median		
All Households	6.06	2.82	3.98	0.74	16.3	12.0	5.7	491
A. Income Level								
Bottom quintile	3.56	2.08	1.16	-1.15	24.4	20.0	1.9	22
Second quintile	5.09	0.25	3.06	-1.56	19.3	12.0	3.3	29
Middle quintile	4.47	2.62	2.27	-0.21	19.2	18.0	6.6	57
Fourth quintile	6.55	2.42	4.57	0.04	13.3	9.0	6.6	66
P80-P90	6.13	4.77	4.13	2.66	13.0	10.0	7.9	53
P90-P95	5.47	4.39	3.38	2.21	16.6	13.0	10.1	40
P95-P99	5.69	4.41	3.66	2.28	13.7	10.0	13.7	77
Top one percent	24.57	5.54	22.60	3.73	12.6	9.0	19.1	146
B. Wealth Level								
Bottom quintile	20.20	5.55	18.10	3.40	8.1	2.0	0.9	7
Second quintile	6.46	2.10	4.56	-0.33	11.6	10.0	2.0	19
Middle quintile	4.02	0.59	2.07	-1.56	12.2	9.0	4.4	36
Fourth quintile	4.08	2.08	1.90	-0.07	19.2	14.0	8.1	69
P80-P90	6.93	2.98	4.85	0.75	17.6	14.0	10.3	52
P90-P95	2.67	3.75	0.54	1.66	17.2	15.0	14.7	54
P95-P99	11.62	4.61	9.65	2.55	16.7	14.0	16.4	95
Top one percent	7.16	5.54	5.06	3.06	16.8	13.0	24.7	159
C. Race								
Non-Hispanic whites	5.21	2.78	3.09	0.60	17.3	13.0	6.8	424
Non-Hispanic Blacks	13.61	2.67	11.69	0.56	10.0	7.0	2.0	16
Hispanics[a]	7.34	4.39	5.52	2.24	15.0	11.0	4.0	24
Asian and other races	8.70	4.41	6.75	1.79	11.5	6.0	7.1	27

D. Age Class[b]								
Under 35	**13.41**	**10.54**	**11.57**	**8.74**	**5.6**	**5.0**	**2.0**	**18**
35-44	**5.62**	**1.76**	**3.77**	**0.18**	**7.3**	**5.0**	**4.3**	**43**
45-54	**5.50**	**2.69**	**3.60**	**0.60**	**10.7**	**8.0**	**6.4**	**96**
55-64	**7.83**	**3.10**	**5.74**	**0.81**	**16.6**	**14.0**	**7.5**	**131**
65-74	**4.10**	**2.61**	**1.96**	**0.38**	**18.6**	**17.0**	**6.6**	**125**
75 & over	**3.59**	**2.90**	**1.08**	**0.60**	**29.6**	**29.0**	**9.8**	**78**
E. Education[c]								
Less than 12 years	**5.05**	**0.63**	**2.92**	**-1.60**	**17.4**	**10.0**	**3.6**	**23**
12 years	**7.96**	**3.01**	**5.87**	**0.62**	**17.2**	**10.0**	**4.6**	**78**
13-15 years	**3.86**	**2.62**	**1.74**	**0.13**	**16.9**	**13.0**	**4.5**	**83**
16 years of more	**6.47**	**3.14**	**4.43**	**1.15**	**15.7**	**12.0**	**8.1**	**307**
F. Family type								
Couples	**6.02**	**2.99**	**3.92**	**0.84**	**16.4**	**12.0**	**7.3**	**391**
Single males	**7.74**	**2.70**	**5.75**	**0.74**	**11.2**	**8.0**	**4.3**	**53**
Single females	**4.90**	**2.75**	**2.78**	**0.01**	**20.6**	**16.0**	**3.4**	**47**

Note: author's computations from the 2019 SCF.
See text for details on the definition of commercial real estate.
a. Hispanics can be of any race.
b. Households are classified according to the age of the head of household.
c. Households are classified according to the education of the head of household.
d. The real rate of return is defined as the nominal return less the average annual rate of change of the CPI. The CPI-U-RS is used for years 1977 onward.
The CPI-U is used for earlier years.
The average annual price change is defined as the arithmetic average of the annual logarithmic change in prices over the relevant period.

Table 4. Regression results for RORHome for Homeowners based on the 2019 SCF

X Variables	(1)		(2)		(3)		(4)		(5)		(6)	
Intercept	2.155	***	4.446	***	1.772	***	0.0574		-1.170	***	1.846	***
	(0.12)		(0.15)		(0.19)		(0.357)		(0.45)		(0.19)	
Income (thousands)	-0.0645		-0.0477		-0.0352		0.027		0.006		0.070	*
	(0.01)		(0.00)		(0.00)		(0.039)		(0.04)		(0.04)	
Net Worth (thousands)	0.0249	***	0.0225	***	0.0223	***						
	(0.00)		(0.00)		(0.00)							
Ln(Net Worth)									0.189	***		
									(0.03)			
NW2040 Dummy							0.181					
							(0.34)					
NW4060 Dummy							1.703	***				
							(0.31)					
NW6080 Dummy							1.253	***				
							(0.31)					
NW8090 Dummy							1.581	***				
							(0.32)					
NW9095 Dummy							1.279	***				
							(0.34)					
NW9599 Dummy							1.736	***				
							(0.33)					
NW99100 Dummy							2.260	***				
							(0.33)					
BLACK Dummy	-0.478	**	-0.311	*	-0.240		-0.008		0.358	*	-0.249	*
	(0.19)		(0.19)		(0.19)		(0.19)		(0.19)		(0.19)	
HISPANIC Dummy	0.037		0.040		0.131		0.263		0.330		0.123	
	(0.21)		(0.20)		(0.20)		(0.20)		(0.20)		(0.20)	
ASIAN Dummy	0.008		-0.054		-0.022		-0.015		0.049		-0.028	
	(0.22)		(0.22)		(0.21)		(0.21)		(0.21)		(0.21)	

AGELT35 Dummy	**1.502**	***	**-0.517**	**	**-0.964**	***	**-0.441**	*	**-0.099**		**-1.015**	***
	(0.24)		**(0.25)**		**(0.25)**		**(0.26)**		**(0.27)**		**(0.24)**	
AGE3544 Dummy	**1.673**	***	**-0.019**		**-0.331**	*	**-0.103**		**0.012**		**-0.378**	**
	(0.17)		**(0.18)**		**(0.18)**		**(0.19)**		**(0.19)**		**(0.18)**	
AGE4554 Dummy	**0.605**	***	**-0.502**	***	**-0.286**	*	**-0.197**		**-0.117**		**-0.318**	**
	(0.15)		**(0.16)**		**(0.16)**		**(0.16)**		**(0.16)**		**(0.16)**	
AGE5564 Dummy	**0.176**		**-0.400**		**-0.204**		**-0.218**		**-0.197**		**-0.225**	
	(0.15)		**(0.14)**		**(0.14)**		**(0.14)**		**(0.14)**		**(0.14)**	
AGE75PLUS Dummy	**-0.672**	***	**0.156**		**-0.037**		**-0.072**		**-0.053**		**-0.019**	
	(0.18)		**(0.18)**		**(0.18)**		**(0.18)**		**(0.17)**		**(0.18)**	
EDUC011 Dummy	**0.675**	***	**1.135**	***	**0.860**	***	**1.132**	***	**1.201**	***	**0.821**	***
	(0.23)		**(0.23)**		**(0.23)**		**(0.23)**		**(0.23)**		**(0.23)**	
EDUC12 Dummy	**0.474**	***	**0.863**	***	**0.804**	***	**1.051**	***	**1.046**	***	**0.780**	***
	(0.14)		**(0.14)**		**(0.14)**		**(0.15)**		**(0.14)**		**(0.14)**	
EDUC1315 Dummy	**0.442**	***	**0.681**	***	**0.705**	***	**0.887**	***	**1.082**	***	**0.673**	***
	(0.13)		**(0.13)**		**(0.13)**		**(0.13)**		**(0.13)**		**(0.13)**	
Single Males Dummy	**-0.390**	**	**-0.426**	***	**-0.427**	***	**-0.307**	*	**-0.262**		**-0.445**	***
	(0.16)		**(0.16)**		**(0.14)**		**(0.16)**		**(0.16)**		**(0.16)**	
Single Females Dummy	**-0.514**	***	**-0.330**	**	**-0.341**	**	**-0.178**		**-0.102**		**-0.375**	***
	(0.15)		**(0.14)**		**(0.01)**		**(0.15)**		**(0.15)**		**(0.14)**	
Holding Period (years)			**-0.116**	***	**-0.0661**	***	**-0.0666**	***	**-0.0647**	***	**-0.0663**	***
			(0.00)		**(0.01)**		**(0.01)**		**(0.01)**		**(0.01)**	
RORNAR					**0.947**	***	**0.952**	***	**0.944**	***	**0.947**	***
					(0.04)		**(0.04)**		**(0.04)**		**(0.04)**	
R-Square	**0.0139**		**0.0471**		**0.0706**		**0.0754**		**0.0758**		**0.0700**	
Adj R-Square	**0.0131**		**0.0463**		**0.0698**		**0.0742**		**0.0749**		**0.0692**	
Number of Observations	**18,160**		**18,160**		**18,160**		**18,160**		**17,621**		**18,160**	

The dependent variable is RORHome, the average annual real rate of return on principal homes for homeowners based on accrued capital gains in percentage points.

Note: Standard errors are shown in parentheses below the coefficient estimate.

***** Significant at one percent level ** Significant at five percent level * Significant at ten percent level**

Omitted categories: (1) whites; (2) age class 65-74; (3) college graduates; (4) married couples; and (5) for specification 4, the bottom net worth quintile.

Table 5. Regression results on RORRes for property owners based on the 2019 SCF

X Variables	(1)		(2)		(3)	
Intercept	5.044	***	9.527	***	9.786	***
	(0.40)		(0.49)		(0.57)	
Income (thousands)	-0.00020		0.00174		0.00175	
	(0.01)		(0.01)		(0.01)	
Net Worth (thousands)	-0.00110		-0.00286		-0.00286	
	(0.00)		(0.00)		(0.00)	
BLACK Dummy	-0.257		-0.064		-1.014	
	(0.84)		(0.82)		(0.95)	
HISPANIC Dummy	0.169		0.827		1.217	
	(0.85)		(0.84)		(0.92)	
ASIAN Dummy	-0.236		0.179		0.512	
	(0.78)		(0.76)		(0.83)	
AGELT35 Dummy	2.346	*	-1.138		1.233	
	(1.35)		(1.35)		(1.71)	
AGE3544 Dummy	-1.807	**	-4.130	***	-4.395	***
	(0.71)		(0.71)		(0.80)	
AGE4554 Dummy	-1.030	*	-3.080	***	-3.273	***
	(0.54)		(0.54)		(0.58)	

AGE5564 Dummy	**-0.903**	*	**-2.313**	***	**-2.688**	***
	(0.50)		**(0.49)**		**(0.52)**	
AGE75PLUS Dummy	**-1.963**	***	**-1.228**	**	**-1.392**	**
	(0.62)		**(0.61)**		**(0.65)**	
EDUC011 Dummy	**-0.517**		**0.455**		**1.215**	
	(1.01)		**(0.99)**		**(1.15)**	
EDUC12 Dummy	**1.055**	*	**1.162**	**	**1.357**	*
	(0.58)		**(0.57)**		**(0.62)**	
EDUC1315 Dmmy	**-0.305**		**-0.186**		**-0.275**	
	(0.51)		**(0.50)**		**(0.55)**	
Single Males Dummy	**-2.566**	***	**-2.098**	***	**-2.265**	***
	(0.68)		**(0.67)**		**(0.77)**	
Single Females Dummy	**-0.573**		**-0.029**		**-0.712**	
	(0.67)		**(0.66)**		**(0.76)**	
Holding Period (years)			**-0.279**	***	**-0.278**	***
			(0.02)		**(0.02)**	
RORNAR					**-0.111**	
					(0.15)	
R-Square	**0.0063**		**0.0445**		**0.0458**	
Adj R-Square	**0.0039**		**0.0420**		**0.0428**	
Number of Observations	**6,160**		**6,160**		**5,572**	

The dependent variable is RORRes, the average annual real rate of return on non-principal home residential real estate for property owners based on accrued capital gains in percentage points.

Note: Standard error is shown in parentheses below the coefficient

***** Significant at one percent level**

**** Significant at five percent level**

*** Significant at ten percent level**

Omitted categories: (1) whites, (2) age class 65-74, (3) college graduates, and (4) married couples.

Table 6. Regression results for RORComm for property owners based on the 2019 SCF						
X Variables	**(1)**		**(2)**		**(3)**	
Intercept	**3.904**		**9.448**	***	**10.985**	***
	(0.88)		**(1.04)**		**(1.27)**	
Income (thousands)	**0.19099**		**0.18623**		**0.15619**	
	(0.12)		**(0.12)**		**(0.12)**	
Net Worth (thousands)	**-0.00038**		**-0.00382**		**-0.00401**	
	(0.01)		**(0.01)**		**(0.01)**	
BLACK Dummy	**3.611**		**2.729**		**-2.441**	
	(2.22)		**(2.18)**		**(3.11)**	
HISPANIC Dummy	**-0.947**		**-0.587**		**-4.475**	**
	(1.83)		**(1.80)**		**(2.03)**	
ASIAN Dummy	**2.321**		**2.681**		**2.362**	
	(1.74)		**(1.71)**		**(1.92)**	
AGELT35 Dummy	**8.338**	***	**4.937**	**	**2.122**	
	(2.23)		**(2.22)**		**(2.92)**	
AGE3544 Dummy	**0.360**		**-2.756**	*	**-3.523**	*
	(1.55)		**(1.56)**		**(1.85)**	
AGE4554 Dummy	**3.439**	***	**1.048**		**0.892**	
	(1.18)		**(1.18)**		**(1.31)**	
AGE5564 Dummy	**3.411**	***	**2.163**	**	**2.420**	**
	(1.09)		**(1.08)**		**(1.17)**	
AGE75PLUS Dummy	**0.512**		**3.226**		**3.306**	**
	(1.25)		**(1.26)**		**(1.37)**	
EDUC011 Dummy	**-2.549**		**-1.351**		**-4.020**	*
	(1.87)		**(1.84)**		**(2.16)**	
EDUC12 Dummy	**0.028**		**0.549**		**0.210**	
	(1.10)		**(1.08)**		**(1.23)**	
EDUC1315 Dummy	**-3.854**	***	**-3.580**	***	**-3.179**	***
	(1.07)		**(1.05)**		**(1.20)**	

Single Males Dummy	**-0.440**	**-1.344**		**-2.602**	*****
	(1.27)	**(1.25)**		**(1.50)**	
Single Females Dummy	**-0.460**	**0.043**		**2.033**	
	(1.35)	**(1.33)**		**(1.62)**	
Holding Period (years)		**-0.304**	*******	**-0.317**	*******
		(0.03)		**(0.04)**	
RORNAR				**-0.440**	
				(0.34)	
R-Square	**0.0197**	**0.0551**		**0.0567**	
Adj R-Square	**0.0137**	**0.0489**		**0.0491**	
Number of Observations	**2,455**	**2,455**		**2,138**	

The dependent variable is RORComm, the average annual real rate of return on commercial real estate for property owners based on accrued capital gains in percentage points.
Note: Standard error is shown in parentheses below the coefficient
***** Significant at one percent level**
**** Significant at five percent level**
*** Significant at ten percent level**
Omitted categories: (1) Whites, (2) Ages class 65-74, (3) college graduates, and (4) married couples.

Table 7. Regression Results on RORHome Based on the 2019 SCF: Variants by Holding Period

			Holding Period (in years)					
X Variables	**Base Case**		**2 or more**		**3 or more**		**5 or more**	
Intercept	**1.772**	***	**1.412**	***	**0.890**	***	**0.521**	***
	(0.19)		**(0.15)**		**(0.13)**		**(0.11)**	
Income (thousands)	**-0.035**		**-0.027**		**-0.025**		**-0.042**	
	(0.00)		**(0.00)**		**(0.00)**		**(0.00)**	
Net Worth (thousands)	**0.022**	***	**0.021**	***	**0.022**	***	**0.027**	***
	(0.00)		**(0.00)**		**(0.00)**		**(0.00)**	
BLACK Dummy	**-0.240**		**-0.242**	*	**-0.416**	***	**-0.726**	***
	(0.19)		**(0.15)**		**(0.12)**		**(0.11)**	
HISPANIC Dummy	**0.131**		**0.409**	***	**0.533**	***	**0.618**	***
	(0.20)		**(0.16)**		**(0.13)**		**(0.12)**	
ASIAN Dummy	**-0.022**		**0.211**		**0.309**	**	**0.050**	
	(0.21)		**(0.17)**		**(0.14)**		**(0.14)**	
AGELT35 Dummy	**-0.964**	***	**0.249**		**0.144**		**-0.530**	**
	(0.25)		**(0.21)**		**(0.19)**		**(0.21)**	
AGE3544 Dummy	**-0.331**	*	**-0.795**	***	**-0.508**	***	**-0.575**	***
	(0.18)		**(0.14)**		**(0.12)**		**(0.12)**	
AGE4554 Dummy	**-0.286**	*	**-0.156**		**-0.150**		**-0.164**	*
	(0.16)		**(0.12)**		**(0.10)**		**(0.09)**	
AGE5564 Dummy	**-0.204**		**-0.064**		**0.039**		**0.132**	
	(0.14)		**(0.11)**		**(0.09)**		**(0.08)**	
AGE75PLUS Dummy	**-0.037**		**0.363**	***	**0.285**	**	**0.047**	
	(0.18)		**(0.14)**		**(0.11)**		**(0.10)**	
EDUC011 Dummy	**0.860**	***	**0.580**	***	**0.556**	***	**0.510**	***
	(0.23)		**(0.17)**		**(0.15)**		**(0.13)**	
EDUC12 Dummy	**0.804**	***	**0.620**	***	**0.399**	***	**0.465**	***
	(0.14)		**(0.11)**		**(0.09)**		**(0.08)**	
EDUC1315 Dummy	**0.705**	***	**0.362**	***	**0.501**	***	**0.350**	***
	(0.13)		**(0.10)**		**(0.08)**		**(0.08)**	

Single Males Dummy	**-0.427**	***	**-0.307**	***	**-0.214**	**	**-0.108**	
	(0.14)		**(0.12)**		**(0.11)**		**(0.09)**	
Single Females Dummy	**-0.341**	**	**-0.537**	***	**-0.453**	***	**-0.312**	***
	(0.01)		**(0.11)**		**(0.09)**		**(0.08)**	
Holding Period (years)	**-0.066**	***	**-0.051**	***	**-0.032**	***	**-0.018**	***
	(0.01)		**(0.00)**		**(0.00)**		**(0.00)**	
RORNAR	**0.947**	***	**0.902**	***	**0.883**	***	**0.899**	***
	(0.04)		**(0.03)**		**(0.03)**		**(0.02)**	
R-Square	**0.0706**		**0.0953**		**0.1124**		**0.1366**	
Adj R-Square	**0.0698**		**0.0944**		**0.1114**		**0.1355**	
Number of Observations	**18,160**		**17,045**		**16,050**		**14,231**	

The dependent variable is RORHome, the average annual real rate of return on principal homes for homeowners based on accrued capital gains in percentage points.

Note: Standard error is shown in parentheses below the coefficient

***** Significant at one percent level**

**** Significant at five percent level**

*** Significant at ten percent level**

Omitted categories: (1) Whites, (2) Ages class 65-74, (3) college graduates, and (4) married couples.

Table 8. The Effect of Differential Rates of Return on Homes (RORhome) On Household Wealth Inequality

	Mean	Median	Gini Coeff.
I. All Households			
Actual Overall Household NW	**723,800**	**100,800**	**0.869**
Overall NW plus One-Year ROR on Homes	**752,906**	**112,607**	**0.864**
Overall NW plus Two-Year ROR on Homes	**768,658**	**118,851**	**0.860**
Overall NW plus Five-Year ROR on Homes	**856,023**	**140,442**	**0.854**
II. Homeowners Only			
Actual Overall Household NW	**1,069,307**	**231,600**	**0.804**
Overall NW plus One-Year ROR on Homes	**1,152,182**	**263,526**	**0.790**
Overall NW plus Two-Year ROR on Homes	**1,177,351**	**278,870**	**0.784**
Overall NW plus Five-Year ROR on Homes	**1,316,943**	**333,442**	**0.775**

Note: author's computations from the 2019 SCF.
The results are based on the real rate of return on homes (RORhome) calculated for each household from the underlying SCF data.

Table 9. The Mean Value of Homes, the Homeownership Rate, and the Rate of Return On Homes (RORHome) By Wealth Class, 2019

Wealth Level	Home Ownership Rate (percentage)	Mean Value of Homes (Home-owners only)	Mean Value of RORHome (Home-owners only) (percentage)	Mean NW (All House-holds)	Ratio of Mean Value of Homes to Mean NW (All House-holds)	Ratio of Mean Value of Homes x RORHome to Mean NW (All House-holds) (percentage)
Bottom quintile	18.1	164,595	4.29	-29,700	--	--
Second quintile	35.6	119,979	4.31	15,123	2.821	4.33
Middle quintile	84.0	173,499	5.37	105,059	1.387	6.26
Fourth quintile	92.1	268,785	4.51	310,078	0.798	3.32
P80-P90	93.2	409,055	4.77	784,770	0.486	2.16
P90-P95	97.8	559,037	4.24	1,685,517	0.324	1.35
P95-P99	93.6	1,057,829	4.55	5,111,080	0.194	0.82
Top one percent	97.1	2,581,214	5.20	27,602,221	0.091	0.46
All households	64.9	344,144	4.73	723,800	0.309	0.95

Note: author's computations from the 2019 SCF.
The results are based on the real rate of return on homes (RORhome) calculated for each household. from the underlying SCF data.