# WHAT RISKS DO NEAR RETIREES AND RETIREES FACE FROM INFLATION?

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**Abstract**

In June 2022, U.S. inflation peaked at 8.9 percent – a dramatically high level after nearly three decades of relatively stable prices. Because inflation has been so low for so long, the risks it poses have been generally overlooked and recent history does not offer much practical insight on its impact. This paper uses economic theory and data from the *Survey of Consumer Finances* to illustrate how a bout of high inflation affects older households' standard of living under different hypothetical macroeconomic scenarios. It shows that high inflation generally harms older households, but the magnitude of the impact depends on two offsetting factors: 1) the extent to which income and investments keep pace with rising prices; and 2) the amount of fixed-rate debt. These two factors lead to varying risk across the age and wealth distribution. Additionally, when recent inflation started to put pressure on household budgets, many responded by reducing new saving and increasing withdrawals from existing saving. Incorporating these behaviors into the scenario analysis shows that households largely offset the immediate loss of real income, but substantially reduce their wealth available to fund future consumption.

## Introduction

In June 2022, U.S. inflation peaked at 8.9 percent – a dramatically high level after nearly three decades of relatively stable prices.[1] Because inflation has been so low for so long, the risks it poses have been generally overlooked and recent history does not offer much practical insight on its impact. But a shock of the magnitude just experienced must surely have affected the retirement security of near retirees and those already retired.

This paper explores that question in three steps. First, it summarizes what is known about inflation's impact on household finances – as well as households' reaction to it – from previous studies. Then, it draws on these insights to illustrate how a bout of high inflation affects older households' standard of living, modeling the path of consumption and wealth for near retirees and retirees under different macroeconomic scenarios. Finally, it considers how older households' responses to inflation affect their financial well-being in both the short- and medium-run.

The results show that high inflation generally harms older households, but the magnitude of the impact depends on two offsetting factors: 1) the extent to which income and investments keep pace with rising prices; and 2) the amount of fixed-rate debt held by the household (which declines in real terms as inflation rises). These two factors lead to varying risk across the age and wealth distribution. For example, inflation harms retirees more than near retirees because – outside of Social Security – income is less indexed to prices, and retirees hold less debt. Similarly, top-wealth households see a smaller reduction in financial assets than their lower-wealth counterparts because they are more heavily invested in equities and businesses that grow with inflation; however, they ultimately end up with a bigger drop in consumption than lower-wealth households living off Social Security.

Additionally, older households react to rising prices by shifting consumption from the future into the present. Specifically, when recent inflation started to put pressure on household budgets, many responded by reducing new saving and increasing withdrawals from existing saving.[2] These actions offset the immediate loss of real income, but substantially reduced the stock of wealth available to fund future consumption.

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[1] Inflation here is measured by 12-month rolling average growth in the Consumer Price Index (CPI-U).

[2] A companion to this paper, Aubry and Quinby (2024), uses new survey evidence to explore how older households reacted to recent inflation.

The rest of this paper is organized as follows. The first section summarizes what we know to date about the impact of an inflation shock on household finances and behavior. The second section describes the baseline scenario analysis (without considering household responses). The third section shows how the results change if we incorporate households' behavioral responses. The final section concludes that recent inflation has worsened the retirement security of today's retirees, but as a result of the shift from defined benefit pensions to defined contribution retirement plans, future cohorts may be better protected from fast-rising prices.

## Prior Research on the Impact of an Inflation Shock on Household Finances

Previous studies provide useful insights for assessing inflation's impact on retirement security. This literature – which reflects a range of time periods, geographies, and analytical methods – addresses two issues: 1) the direct effect of an inflation shock on household income and wealth; and 2) how households react to inflation, in terms of consumption, saving, investment allocation, and the decision to retire.[3]

### *How Does an Inflation Shock Affect Household Income and Wealth?*

Studies of inflation's impact on retirement security generally fall into two camps: pre- and post-COVID-19. Prior to the pandemic, the United States and many Western European countries had not seen a major rise in price levels since the late 1970s and early 1980s. Thus, researchers interested in this question used statistical analysis to relate small changes in inflation and interest rates during the 1990s and 2000s to the real value of household income, assets, and debt.[4] Given that the inflation fluctuations during this period were very small, one should exercise caution extrapolating these results to 2022.

[3] We also reviewed a vast literature on the macroeconomic determinants of inflation as well as how households and firms set their inflation expectations, but this literature is outside the scope of our analysis and so is not summarized here.

[4] Adam and Tzamourani (2016); Albanesi (2007); Auclert (2019); Bach and Stephenson (1974); Crawford and Oldfield (2002); Doepke and Schneider (2006a, 2006b, and 2006c); Erosa and Ventura (2002); Gurer and Weichenrieder (2020); Hottman and Monarch (2020); Hobijn and Lagakos (2005); Jaravel (2021); Kaplan and Schulhofer-Wohl (2017); Lee, Macaluso, and Schwartzman (2021); McGranahan and Paulson (2005); and Yang (2022). A few post-pandemic papers also take this approach; for example, see Bartscher et al. (2022); Del Canto et al. (2023); Lauper and Mangiante (2021); McKay and Wolf (2023); Orchard (2022); and Wolff (2023).

Nevertheless, the pre-pandemic literature confirmed a key insight: inflation impacts households differently based on the specific source of their income, the allocation of their assets, and their exposure to fixed-rate mortgage debt. On the income side, households approaching retirement face the risk that labor earnings do not keep pace with rising prices. Since wages and salaries are often negotiated on a set schedule (typically once per year), earnings tend to lag inflation. And unemployment poses a significant risk if the Federal Reserve's response to inflation triggers a recession. Similarly, many retirees still rely on defined benefit pensions, which often do not keep pace with inflation (although these plans are increasingly rare for private sector workers).[5] On a more positive note, most retirees also receive inflation-indexed income from Social Security.

Regarding wealth, the direct impact of inflation depends on the household's portfolio and the nature of the shock. For example, financial models predict that fixed-income holdings suffer from sudden price increases. Equities fare better, so long as the Federal Reserve avoids a recession.[6] And while house prices rise with inflation, this growth may be offset by shrinking demand if rising interest rates make it harder for prospective buyers to take out a mortgage.[7] On the other hand, households that already hold mortgage debt benefit from inflation because the real burden of the debt goes down.[8] Hence, inflation redistributes resources from older generations (who are typically lenders) to younger generations (who are often borrowers).

More recently, the rapid rise in inflation that began in 2022 has sparked a flurry of research activity. Several post-pandemic studies maintain the spirit of previous literature, assessing the change in household well-being given the observed evolution of wages, financial assets, and real estate prices.[9] However, these studies can be difficult to interpret, as inflation coincided with a host of other events – the pandemic, supply chain disruptions, and war in Ukraine – that also impacted financial markets. Moreover, governments responded with a combination of monetary policy and fiscal stimulus that directly affected household balance

[5] While most private sector pensions do not provide any inflation adjustments to benefit payments, a majority of state and local government pensions provide adjustments that account for a portion of the rise in prices.
[6] Specifically, the concern here is whether the Federal Reserve takes overly aggressive action that triggers a recession. Cieslak and Pflueger (2023) provide a nice overview of these models.
[7] Glaeser, Gottlieb, and Gyourko (2010).
[8] Since most U.S. households hold fixed-rate mortgages, the monthly mortgage payment stays constant even as household income rises with inflation.
[9] See, for example, Cardoso et al. (2022) and Pallotti et al. (2023).

sheets. Consequently, the impact of recent inflation on household finances is hard to isolate from these other factors.

*How Do Households React to an Inflation Shock?*

In parallel, an interesting new body of work tackles a different question: how households respond to inflation pressures. These analyses either use surveys to ask households directly about their experiences with recent inflation; or use randomized control trials and data on household expenditures to assess how behavior changes when households are informed about current or expected inflation.[10]

Unsurprisingly, they find that inflation reduces consumption and saving due to lower real income and wealth. Focusing on older households – the relevant population for this study – the previous research finds that 25 to 45 percent of near retirees decreased their saving between 2021 and 2023 because of rising prices.[11] Among those who made a change, the effects were large – by the end of the period, saving had dropped by around 4 percent of household income (Aubry and Quinby 2024). Additionally, around 20 percent of near retirees and retirees withdrew funds from their existing savings to cover living expenses; among those making a change, the increase amounted to about 5 percent of household income.

A couple of recent studies also ask whether older workers have updated their expected retirement date. While they find that respondents expect to retire later because of inflation, the magnitude of the effect is small – many workers claimed that they would delay retirement at the height of inflation in 2022, but they did not follow through on these plans once inflation abated in 2023.[12]

Similarly, few households shifted their asset allocation to any meaningful extent. Some households made small shifts (less than 3 percent of assets) away from equities toward fixed income and cash (Aubry and Quinby 2024). Indeed, a preference for conservative investments has been found in several studies, attributable to rising interest rates and fear of a possible

[10] Allianz Life (2022); Bachmann, Berg, and Sims (2015); Binder (2017); Botsch and Malmendier (2020); Coibion et al. (2019); Coibion, Gorodnichenko, and Weber (2022); MFS Investment Management (2023); Nationwide (2022); Schnorpfeil, Weber, and Hackethal (2023); Vellekoop and Wiederholt (2020); and Yakoboski, Lusardi, and Hasler (2023).
[11] Aubry and Quinby (2024); Allianz Life (2022); Nationwide (2022); and Yakoboski, Lusardi, and Hasler (2023).
[12] Nationwide (2022) finds that older workers (ages 45+) expect to retire three years later, on average, due to financial pressures from inflation, whereas Aubry and Quinby (2024) find only 4 percent of workers expecting to delay retirement.

recession; one recent paper shows that a surprising 49 percent of retirees reallocate to cash in the face of inflation.[13]

*Unanswered Questions*

Although the existing research is helpful for understanding inflation's impact on retirement security, many questions remain. For instance: how vulnerable were older households to the recent inflation shock, given their income, investment allocation, and debt holdings? Were certain households more vulnerable than others? How did households' reaction to inflation change their situation? And, are future generation of retirees more or less at-risk than current cohorts?

**How Vulnerable Are Older Households to an Inflation Shock? A Scenario Analysis**

Our analysis begins with a simple exercise to assess the vulnerability of older households to the recent bout of high inflation. Because inflation has been so low over the past 30 years, past experience does not offer much practical insight. Instead, we use economic theory to model the finances of six hypothetical households – of different ages and wealth levels – under a range of possible macroeconomic conditions.

Before diving into the analysis, this section defines the metrics we use to assess inflation's impact on retirement security, introduces the hypothetical households featured in our illustration, and lays out the stylized macroeconomic scenarios.

*How Do We Measure Inflation's Impact on Retirement Security?*

Intuitively, the amount of non-housing goods and services that households can consume each year depends on their income, prevailing price levels, and the extent to which they have recurring fixed expenses such as a home mortgage. For working households, this intuition can be expressed with a simple equation:

$$P * C = I - M - S \quad (1)$$

[13] Franklin (2023). Most of the retired households in this study identify equities and inflation-indexed bonds as the best hedges, but still prefer to reallocate their savings towards cash. A survey fielded by MFS Investment Management (2023) similarly finds that households have adopted more conservative investment strategies due to inflation.

Where $P$ denotes the price of goods and services (we assume a single price for illustrative purposes, such as the CPI-U); $C$ reflects the amount of non-housing goods and services consumed; $I$ represents income; $M$ is the fixed mortgage payment; and $S$ reflects any saving that households are doing to build a stock of wealth.[14]

The math is very similar for retired households, who receive income ($I$) from external sources – such as Social Security or an employer pension – and also fund consumption by drawing down their stock of wealth:

$$P * C = I + dW - M \quad (2)$$

Where ($d$) represents the drawdown rate of wealth ($W$). From one year to the next, inflation impacts the quantity consumed ($C$) directly through the price level ($P$) and indirectly through the growth of income and wealth.[15]

Hence, our scenario analysis focuses on two metrics. First, we look at the real change in current non-housing consumption ($C$) from the beginning of our analysis period to the end.[16] Second, we also consider potential future consumption by evaluating the stock of household wealth at the end of the period. Since the ultimate goal of this exercise is to understand the impact of recent inflation, we model consumption and wealth from 2021 to 2025, with all values expressed in 2021 dollars.

*A Financial Profile of Older Households*

The analysis considers two groups of hypothetical households whose starting levels of income and wealth are designed to reflect actual households in the 2019 *Survey of Consumer Finances* (SCF):[17]

[14] Note that saving can be negative if households draw down their existing assets or take on additional debt. Households also pay income and consumption taxes that reduce the amount of disposable income. While income tax brackets are indexed for inflation, households might shift brackets as a result of inflation (both because mortgage payments are tax deductible and because household income might not fully keep pace with inflation). We do not model this shift because it is complex and – for most households – has a relatively small impact on average tax rates.
[15] See Appendix A for two examples involving working households.
[16] Conceptually, the real change in consumption accounts for the rise in the price level over time.
[17] We use the 2019 SCF because the most recent 2022 data reflect households' experience in 2021, which was still an unusual pandemic year with significant (and transitory) federal stimulus transfers.

1. *Near retirees:* for households in this group, the survey-designated "household head" is 55 to 62 in 2021 and employed full-time. Sixty-two percent of these households are married, and we stipulate that the spouse is not yet receiving Social Security or pension income. In practice, most of the spouses are employed.[18]

2. *Retirees:* households in this group have a head age 62 or over. Both the head and spouse self-identify as retired (46 percent of these households are married); and the household receives Social Security income.

Table 1 shows the components underlying consumption for households near and in retirement, by wealth tercile.[19] Most of the near retirees have few sources of income beyond labor earnings. Those in the top wealth tercile also have investment income and income from "other" sources such as businesses. Additionally, a modest number of working households already receive an employer pension. Importantly, the average household must spend a portion of its income on debt obligations, particularly mortgage payments.[20]

Retirees, meanwhile, receive most of their income from Social Security and defined benefit pensions. Those in the top wealth tercile also make significant withdrawals from their defined contribution plans (which include IRAs) and have notable income from capital and "other" sources. Retirees are much less likely to be making mortgage payments than near retirees.

Similarly, Table 2 shows the components of wealth by retirement status and wealth tercile. Housing is the primary asset for all households. However, those in the top tercile also have significant non-housing wealth in the form of stock and bond holdings (primarily through employer-sponsored defined contribution plans), cash (which includes certificates of deposit), and "other" assets (including businesses, annuities, vehicles, and life insurance). On the liabilities side of the balance sheet, most households have mortgage debt, although – as noted earlier – this debt is less important for wealthier households and retirees.

[18] Specifically, 70 percent of spouses are also employed.
[19] The terciles are based on total wealth excluding Social Security and defined benefit pensions but including housing.
[20] The average mortgage payment amount in Table 1 includes households who no longer have a mortgage (i.e. their mortgage payments are zero).

*Four Macroeconomic Scenarios*

The next step is to determine how inflation impacts the various components of income and wealth. Our analysis runs from January 2021 through December 2025. Inflation and interest rates were still low at the beginning of 2021, reflecting a long period of loose monetary policy (see Figure 1). Although the economy had largely recovered from the brief but severe pandemic recession, the output gap (actual versus potential GDP) was still significantly negative.

Inflation can have different effects depending on the Fed's policy response. For this reason, we consider four hypothetical scenarios:

*No inflation.* In this baseline scenario, the economy gradually emerges from the long period of below-potential growth and achieves zero output gap by December 2025. To maintain target inflation of 2 percent with no output gap, the Fed incrementally raises interest rates to 4 percent (2 percent above inflation) by December 2025.[21]

*Permanent shock.* In this (rather unrealistic) scenario, the "no inflation" scenario is modified so that inflation suddenly spikes at 4 percent in May 2021 – as was actually the case – and remains at that level thereafter. Importantly, under this scenario, the Fed accepts the higher rate of inflation as its new target, and steadily raises the Federal Funds Rate to 6 percent to maintain 4-percent inflation and achieve a zero-percent output gap by December 2025.

*Soft landing.* This third scenario considers a more realistic trajectory for the economy. Inflation takes off in May 2021 and the Fed effectively uses monetary policy to reach its target of 2 percent with zero output gap by December 2025 – without triggering a recession. Specifically, this scenario mimics actual macroeconomic conditions from 2021 to 2023 – inflation climbing to 9-percent, a jump in the Federal Funds Rate to over 5 percent, and a subsequent decline in inflation to just over 3 percent – and then projects a smooth path forward to 2-percent inflation, a zero-percent output gap, and a 4-percent Federal Funds Rate by December 2025.

[21] The Taylor Rule is an equation specifying the optimal level of the Federal Funds Rate (r) given a level of inflation (p) and output gap (y). Bernanke (2015) demonstrates that the specification: $r = p + y + 0.5(p-2) + 2$ best fits the Fed's decision-making in practice.

*Recession.* The last scenario envisions a recession following aggressive Fed policy to tamp down inflation. As in the "soft landing," this scenario mimics actual inflationary conditions from 2021 to 2023. But, rather than a smooth return to normal by 2025, inflation begins to rise again in 2024. The Fed responds by aggressively raising interest rates with the Federal Funds Rate peaking at 8 percent in January 2025. Ultimately, such a high rate triggers a recession (about half as severe as the Great Recession) and an immediate downward trend in inflation. Realizing the costly effects of overly aggressive policy, the Fed quickly brings rates back down; however, the economy does not fully recover by the end of the analysis period.

Conceptually, the first scenario represents a benchmark against which to measure the overall impact of inflation. The next two scenarios show how inflation impacts retirement security without the confounding influence of a recession; and the last scenario shows the combined effects of inflation plus a recession.

*Projecting Income and Wealth Under Different Scenarios*

To illustrate the impact on consumption and wealth, we must make assumptions about how different types of income and assets evolve in our macroeconomic scenarios between 2021 and 2025.

*Wages:* Matching the typical experience of workers over age 50 (and consistent with prior literature), the first three scenarios assume that wages lag inflation by one year with no real growth.[22] In the last scenario ("recession"), wages lag inflation until the recession occurs, after which they freeze as a result of the economic downturn.

*Social Security:* Social Security benefits are fully indexed for inflation.[23]

[22] In our initial scenario analysis, we assume that workers do not work more or less due to inflation, so the growth in annual earnings is determined by employer wage-setting behavior.
[23] Although this adjustment is made instantaneously in our model, Social Security cost-of-living (COLA) adjustments actually occur with a one-year lag. Additionally, Social Security's COLA reflects average inflation nationwide, which might deviate from the local inflation experienced by each household.

*Defined benefit pensions:* Most private defined benefit plans do not provide cost-of-living (COLA) adjustments, whereas government plans typically grant a COLA equal to the CPI up to a cap of 3 percent.[24]

*Capital and other income:* Capital income is projected to grow with GDP. Other income includes business, farm, rental, alimony, and government transfers. Business, farm, and rental income are presumed to grow with GDP; alimony and government transfers remain at current levels.[25]

*Saving rate for working households:* Based on data in the 2019 SCF, the analysis assumes that 34, 64, and 73 percent of working households in the bottom, middle, and top terciles participate in a defined contribution retirement plan, respectively. Participating households contribute varying percentages of their labor earnings each year depending on their wealth tercile.[26]

*Drawdown rate for retired households:* A growing literature suggests that households use rules of thumb – such as the 4-percent rule or the Required Minimum Distribution (RMD) Schedule – to withdraw a set percentage of their retirement accounts each year.[27] For our baseline analysis, we assume that retirees take RMDs (which are designed to slowly deplete balances in defined contribution plans over an average lifespan) according to the schedule for 2022 tax returns.[28]

*Wealth:* Predicting the path of wealth under each macroeconomic scenario is much more challenging. Mechanically, the change in wealth from one year to the next depends on the growth rate of the various assets held by the household, the share of the portfolio allocated to

[24] Munnell, Aubry, and Cafarelli (2014). In the SCF, just over half of households with pension income report receiving COLA adjustments, and the share with a COLA is increasing over time. These trends are consistent with private defined benefit plans becoming less available. Consequently, we assume that 60 percent of pension income receives an adjustment, with the COLA capped at 3 percent.
[25] Based on the 2019 SCF, we assume that other income is 100 percent alimony and government transfers for the lowest wealth terciles. For the middle and top terciles, we presume 95 and 25 percent, respectively.
[26] The employee and employer contribution rates are set according to data in Vanguard (2022). We assume that these contributions are split between bonds and stocks as implied by the wealth holdings in Table 2.
[27] Munnell, Wettstein, and Hou (2020) and citations therein.
[28] See https://www.irs.gov/publications/p590b#en_US_2022_publink100089977. This assumption is consistent with a growing body of empirical work suggesting that RMDs have become the default drawdown strategy for many retirees (see, for example, Brown, Poterba, and Richardson 2023).

each asset class, and the decline in debt outstanding.[29] We make a simplifying assumption that all debt has a fixed interest rate, so the decline in debt is determined solely by a pre-determined payment schedule.[30] Hence, the challenge is how to relate the growth of each asset class to macroeconomic conditions.[31] Appendix B provides a detailed description of our methodology for each asset class.

*Results of the Scenario Analysis*

Ultimately, we are interested in two outcomes – the cumulative change in real consumption from 2021 to 2025 and wealth in 2025 – for two types of households – near retirees and retirees – across four macroeconomic scenarios.[32] Throughout, we are mindful that in the real world, other events that also affected household finances coincided with inflation. To avoid comparing our illustration to real-world outcomes, we present all results relative to the baseline scenario of no inflation.

Table 3 shows the difference in the growth rate of real consumption, relative to the "no inflation" baseline, where two points stand out. First, near retirees typically experience a smaller decline in consumption than retirees, even enjoying real consumption gains in the "soft landing" scenario. This outcome is due to the real decline in mortgage payments relative to earnings.[33] Retirees have less erosion of real debt, and often also lose real income as employer pension benefits are only partially indexed to inflation, while those relying on private savings must contend with a drop in real wealth.

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[29] Technically, assets in the second period can be written as a function of assets in the first period and the previous year's saving or drawdown: $A_{t+1} = (A_t + S_t) * \sum_c (a_{c,t+1} * g_{c,t+1})$ where $S_t$ denotes saving (negative values indicate drawdown) and $\sum_c (a_{c,t+1} * g_{c,t+1})$ reflects an average of the growth rates of the various asset classes from year *t* to *t+1* weighted by the share of the portfolio held in each class ($a_{c,t+1}$).

[30] The mortgage terms are based on the *Survey of Consumer Finances* (2019). All households pay between 4 and 5 percent interest on their mortgages, and all retiree households have 5 years remaining on their mortgage. Near retirees in the lowest wealth tercile have 6 years remaining on their mortgage while those in the middle and top terciles have 10 years remaining.

[31] Researchers and practitioners have developed complex stochastic models to simulate the future performance of various asset classes based on initial market conditions (see Jakhria et al. 2019 for a review of these models). However, we adopt a much simpler approach both for transparency and to avoid overstating the degree of confidence in our illustration.

[32] Recall that consumption equals monthly income less saving and debt payments. Wealth, meanwhile, equals financial and housing assets minus outstanding debt. We compare the growth in these outcomes to the rise in price levels to understand whether households maintain their standard of living. Put simply, if consumption and/or wealth grow more slowly than inflation, a household is worse off.

[33] Since we assume that wages lag inflation, they decline in real terms when inflation is rising, then grow in real terms when inflation abates.

Second, the impact of inflation varies across the wealth distribution. Near retirees in the top wealth tercile fare better than same-age households with fewer resources because they derive more of their income from businesses that have real growth. Conversely, retirees in the bottom wealth tercile often fare better than their higher-wealth counterparts because they are more reliant on Social Security, which is fully indexed for inflation.

Turning now to financial (non-housing) wealth in 2025, we see that inflation has an unambiguous negative impact (see Table 4). Top-wealth households, however, always lose less than their lower-wealth counterparts, because they invest in equities, businesses, and other assets that grow with inflation. Table 5 illustrates the impact of inflation on housing wealth in 2025, relative to the "no inflation" scenario. Unlike financial wealth, inflation does not have much impact on housing wealth. On the one hand, home prices decline as rising real interest rates weaken demand; on the other hand, inflation erodes the real burden of mortgage debt. For this reason, near retirees often come out slightly ahead of retirees because they are still paying down their mortgage.

In summary, most older households lose real consumption and wealth after an inflation shock. The magnitude of the loss depends on the nature of the shock, the real growth of income and assets, and the household's exposure to fixed-rate debt. However, the analysis so far has assumed no behavioral response from households – an unrealistic assumption. How do the results change if households react to inflation?

**Implications for Retirement Security**

The last step in our analysis is to incorporate households' behavioral responses into the scenario modeling. For this exercise, we rely on the behaviors reported in Aubry and Quinby (2024), a companion to this paper.[34] As discussed in the literature review, that paper used a new survey of older households to estimate the impact of inflation on saving, withdrawals, labor supply, and investment allocation. It found a large reduction in saving for near retirees and increase in withdrawals for both near retirees and retirees; but only modest effects on labor supply and no meaningful change in investment allocation. Hence, for simplicity, we illustrate

[34] We do not consider labor supply responses for two reasons. First, very few near retirees change their retirement age, and that delay occurs after our analysis period ends. Second, although near retiree households took on more work in response to inflation, we do not know how much their earnings increased.

what happens to consumption and wealth if near retirees change both their saving and withdrawals, and retirees increase their withdrawals.

Specifically, for each near-retiree household in the survey, Aubry and Quinby (2024) calculate the total reduction in saving (the reduction in new saving plus the increase in withdrawals) between 2021 and 2023. They find that this reduction in saving was about 4 percent of 2023 income. However, the survey did not ask about household behavior in 2022. For our scenario model, we annualize the 4-percentage-point drop to 2 percent per year – a conservative assumption similar to assuming that households did not react at all in 2022 – and view the results as a lower-bound of the true impact. We likewise assume that retirees increase their annual withdrawals by 2.5 percent of income (annualizing the 5-percentage-point increased reported in Aubry and Quinby 2024).[35] For simplicity, we assume that households across the wealth distribution respond similarly and that the annualized rates of change start in May 2021 and persist through December 2025.[36]

Table 6 shows the difference in the growth rate of real consumption, from 2021 to 2025, relative to the "no inflation" scenario once we incorporate these behavioral responses. Unsurprisingly, households are able to close much of the inflation-consumption gap by tapping into their savings. The positive percentages for near retirees even indicate that these households *increase* their real consumption relative to no inflation, more than offsetting the short-term pain from rising prices.[37] This short-term gain, however, comes at the expense of future consumption. Table 7 compares real financial wealth in 2025, with behavioral responses, to the "no inflation" scenario.[38] As expected, reduced saving and increased withdrawals compound the negative impact of inflation on investment returns.

To clearly illustrate this trade-off between current and future consumption, Figure 2 compares the results incorporating the behavioral responses to the original baseline analysis for

[35] For retirees in the bottom wealth tercile, we assume that withdrawals only increase by 1.2 percent of income, since any greater change would deplete the assets in their retirement accounts before the end of our analysis period.
[36] Aubry and Quinby (2024) show that households in the top two terciles of 2023 income behave similarly, while those in the bottom tercile exhibit a larger response. However, it is not clear whether lower-income households truly behave differently, or whether the reported gap simply reflects measurement error (since income is measured in 2023 and hence is affected by withdrawal behavior).
[37] Of course, the precise impact on consumption is difficult to determine since the behavioral responses are based on real-world macroeconomic experiences whereas our scenario analysis projects consumption and wealth under hypothetical conditions.
[38] The figure excludes housing wealth because saving and withdrawals do not have any effect on home value or mortgage debt in our illustration.

one type of household: near retirees in the middle wealth tercile under the "soft landing" scenario. Recall that, in the original model, real consumption grew half a percentage point more than in the "no inflation" scenario (due to the real decline in mortgage debt). After households reduce their saving, real consumption grows 6.4 percentage points more than in "no inflation." However, whereas the initial model found a 6.6-percent reduction in financial wealth compared to "no inflation," the results incorporating behavioral responses create an 11.9-percent drop. This same trade-off holds across all age groups, wealth terciles, and macroeconomic scenarios.

**Conclusion**

Older households have just had a sharp reminder that inflation may not be stable throughout retirement. Experiencing a bout of high inflation later in life is generally harmful to financial well-being, but the impact varies depending on the household's specific financial profile: the extent to which income and assets grow with (or lag) inflation, and the amount of fixed-rate debt outstanding. So the question becomes, what could older households do to mitigate the risk of a future inflation shock?

Households that are still working when inflation hits have the most flexibility to improve their situation. The biggest risk they face is that wages will not keep pace with inflation. But, since wages tend to lag prices, this risk declines the longer households stay in the workforce: eventually, workers are likely to see real wage gains. Working longer allows households to compensate for reduced saving at the height of inflation, and also shortens the retirement period over which savings must spread. In practice, many households cut back their saving and increased withdrawals when inflation spiked in 2022, but very few are compensating by working longer.

Retired households have less opportunity to earn inflation-adjusted income. Many are still reliant on defined benefit pensions (although Social Security is fully indexed for inflation, albeit with a one-year lag). And retirees tend to invest more conservatively in fixed-income products that lose value during inflation. However, retired households can still take a few protective steps. For instance – to the extent possible – they can re-invest the assets held in fixed-income when inflation hits, rather than making withdrawals that lock in large losses.

Of course, this study is only a first look at a very broad topic, and much room remains for additional research. In particular, a key lesson from this paper is that an inflation shock is worst

for retired households with defined benefit pensions and fixed-income investments. Exposure to these sources of income will shift dramatically in the coming years, as the Baby Boomers increasingly rely on defined contribution plans that are still heavily invested in equities. Additionally, the behavioral impacts estimated in this paper are relatively short-term, and reflect a period when inflation was at a peak. If households reverse course as inflation moderates, saving more and withdrawing less, they may be able to rebuild their stock of wealth. We leave these and other questions for future research.

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## Tables and Figures

Table 1. *Average Annual Income and Debt Payments, by Retirement Status and Wealth Tercile, 2018*

| | Near retirees | | | Retirees | | |
|---|---|---|---|---|---|---|
| | Bottom tercile | Middle tercile | Top tercile | Bottom tercile | Middle tercile | Top tercile |
| Income | $53,606 | $78,100 | $230,800 | $30,300 | $48,400 | $113,900 |
| Labor earnings | 50,700 | 71,900 | 198,500 | 1,400 | 2,700 | 7,600 |
| Capital income | 6 | 300 | 14,100 | 100 | 500 | 19,200 |
| Social Security | 0 | 0 | 0 | 16,800 | 23,100 | 30,000 |
| Employer pension | 1,200 | 2,800 | 4,100 | 7,900 | 16,500 | 24,600 |
| DC withdrawals | 200 | 200 | 800 | 1,800 | 3,000 | 17,800 |
| Other | 1,500 | 2,900 | 13,300 | 2,300 | 2,600 | 14,700 |
| Debt payments | 8,300 | 12,400 | 24,400 | 2,500 | 4,500 | 7,200 |
| Mortgage | 4,400 | 8,400 | 16,400 | 1,500 | 3,000 | 4,800 |
| Other | 3,900 | 4,000 | 8,000 | 1,000 | 1,500 | 2,400 |

Notes: Capital income includes non-taxable investments such as municipal bonds, other interest, and income from dividends. Other income includes business, farm, rental, alimony, and government transfers.
*Source:* Authors' calculations from the *Survey of Consumer Finances* (2019).

Table 2. *Average Assets and Liabilities, by Retirement Status and Wealth Tercile, 2019*

| | Near retirement | | | Retired | | |
|---|---|---|---|---|---|---|
| | Bottom tercile | Middle tercile | Top tercile | Bottom tercile | Middle tercile | Top tercile |
| Assets | $111,800 | $351,500 | $3,639,400 | $72,600 | $308,000 | $2,151,300 |
| Real estate | 75,500 | 216,600 | 1,055,200 | 53,200 | 212,500 | 723,500 |
| Bonds | 7,300 | 40,800 | 381,100 | 1,000 | 11,800 | 294,500 |
| Stocks | 6,100 | 35,800 | 731,700 | 1,600 | 18,500 | 585,800 |
| Cash | 5,000 | 23,200 | 187,000 | 5,700 | 31,000 | 164,100 |
| Other | 18,100 | 35,100 | 1,284,400 | 11,100 | 34,200 | 383,400 |
| Liabilities | 61,500 | 97,700 | 255,000 | 27,300 | 38,600 | 69,700 |
| Mortgage debt | 41,700 | 74,200 | 181,800 | 18,600 | 30,900 | 50,000 |
| Other debt | 19,800 | 23,500 | 73,200 | 8,700 | 7,800 | 19,700 |

Notes: Total assets and liabilities may not add to the sum of their components due to rounding.[39]
*Source:* Authors' calculations from the *Survey of Consumer Finances* (2019).

[39] In Table 2, the items are defined as follows. Real estate: value of the primary residence + other residential real estate + net equity in non-residential real estate. Bonds: bonds, savings bonds, (1/2) of combination mutual funds, tax-free mutual funds, govt. bond mutual funds, other bond mutual funds, other mutual funds, and non-stock holdings in DC and IRA accounts. Stocks: stocks, stock mutual funds, (1/2) of combination mutual funds, and stocks in DC and IRA accounts. Cash: checking, saving, money market accounts, call accounts at brokerages and certificates of deposits. Other: cash value of whole life insurance, prepaid cards, other financial assets, cash value of annuity and other managed accounts, vehicles, businesses, and other non-financial assets.

Table 3. *Cumulative Change in Growth Rate of Real Consumption Relative to the "No Inflation" Scenario, by Wealth Tercile, 2021-2025*

| Economic scenario | Near retirees | | | Retirees | | |
|---|---|---|---|---|---|---|
| | Lower third | Middle third | Top third | Lower third | Middle third | Top third |
| Permanent shock | -1.6 ppt | -1.5 ppt | -1.4 ppt | -3.0 ppt | -3.6 ppt | -4.2 ppt |
| Soft landing | 0.4 | 0.5 | 0.3 | -3.4 | -3.9 | -2.2 |
| Recession | -4.6 | -4.5 | -4.0 | -4.2 | -5.0 | -5.5 |

*Source:* Authors' estimates from the *Survey of Consumer Finances* (2019).

Table 4. *Financial Wealth Relative to the "No Inflation" Scenario, by Wealth Tercile, 2025*

| Economic scenario | Near retirees | | | Retirees | | |
|---|---|---|---|---|---|---|
| | Lower third | Middle third | Top third | Lower third | Middle third | Top third |
| Permanent shock | -12.2% | -12.0% | -6.1% | -9.2% | -8.4% | -5.4% |
| Soft landing | -8.1 | -6.6 | -3.0 | -9.5 | -7.7 | -2.9 |
| Recession | -10.1 | -9.0 | -5.2 | -11.6 | -9.8 | -5.1 |

*Source:* Authors' estimates from the *Survey of Consumer Finances* (2019).

Table 5. *Housing Wealth Relative to the "No Inflation" Scenario, by Wealth Tercile, 2025*

| Economic scenario | Near retirees | | | Retirees | | |
|---|---|---|---|---|---|---|
| | Lower third | Middle third | Top third | Lower third | Middle third | Top third |
| Permanent shock | 2.5% | 2.8% | 1.1% | 0.1% | 0% | 0% |
| Soft landing | 1.2 | 2.1 | 0.4 | -0.9 | -0.7 | -0.7 |
| Recession | 0 | 1.5 | -0.2 | -2.0 | -1.6 | -1.6 |

*Source:* Authors' estimates from the *Survey of Consumer Finances* (2019).

Table 6. *Cumulative Change in Growth Rate of Real Consumption – Incorporating Behavioral Responses – Relative to the "No Inflation" Scenario, by Wealth Tercile, 2021-2025*

| Economic scenario | Near retirees | | | Retirees | | |
|---|---|---|---|---|---|---|
| | Lower third | Middle third | Top third | Lower third | Middle third | Top third |
| Permanent shock | 6.0 ppt | 4.3 ppt | 3.7 ppt | -1.8 ppt | -1.1 ppt | -1.6 ppt |
| Soft landing | 8.1 | 6.4 | 5.7 | -2.2 | -1.4 | 0.3 |
| Recession | 2.7 | 1.1 | 1.0 | -3.0 | -2.6 | -3.0 |

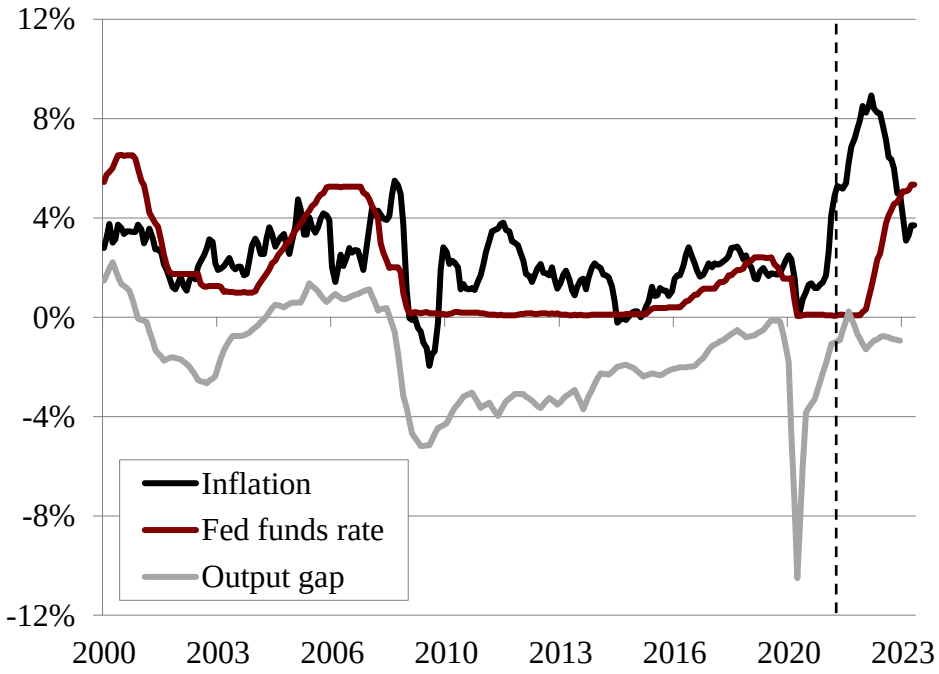
*Sources:* Authors' estimates from the *Survey of Consumer Finances* (2019) and survey data provided by Greenwald Research (2023).

Table 7. *Financial Wealth – Incorporating Behavioral Responses – Relative to the "No Inflation" Scenario, by Wealth Tercile, 2025*

| Economic scenario | Near retirees | | | Retirees | | |
|---|---|---|---|---|---|---|
| | Lower third | Middle third | Top third | Lower third | Middle third | Top third |
| Permanent shock | -24.2% | -16.7% | -6.8% | -17.7% | -14.3% | -6.7% |
| Soft landing | -21.7 | -11.9 | -3.9 | -18.8 | -14.2 | -4.3 |
| Recession | -24.1 | -14.5 | -6.1 | -21.4 | -16.6 | -6.5 |

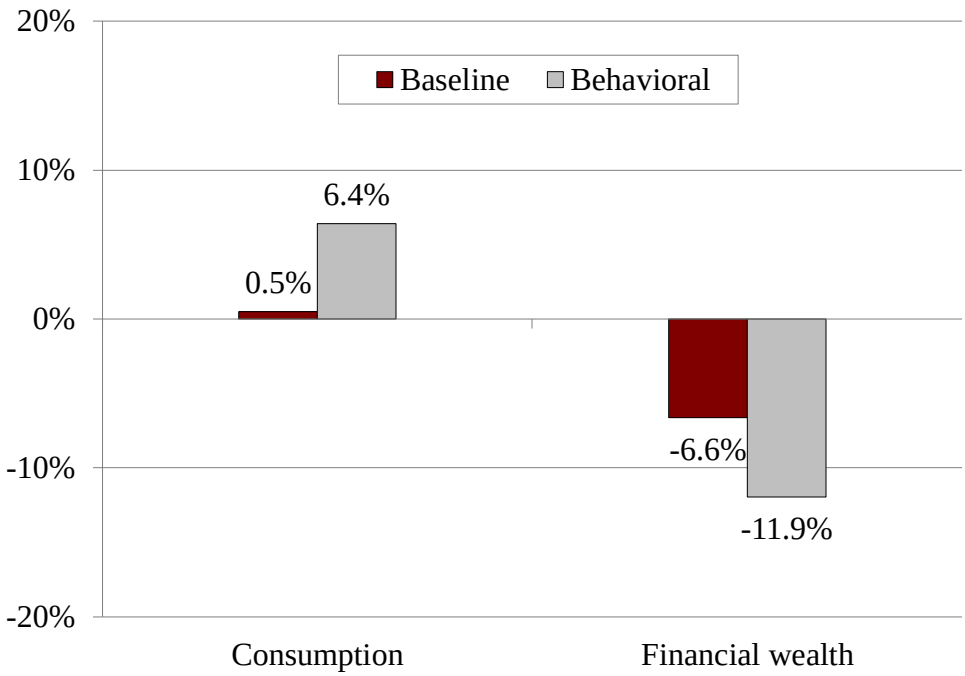
*Sources:* Authors' estimates from the *Survey of Consumer Finances* (2019) and survey data provided by Greenwald Research (2023).

Figure 1. *Inflation, Federal Funds Rate, and Output Gap, Jan. 2000-Dec. 2023*




Notes: Inflation measures the year-over-year change (June to June) in the CPI-U. The output gap measures the percentage difference in real GDP from real potential GDP as estimated by the Congressional Budget Office.
*Sources*: Congressional Budget Office (2023); Federal Reserve Bank of St. Louis (2000-2023a); and U.S. Bureau of Labor Statistics (2000-2023).

Figure 2. *Cumulative Change in Growth Rate of Real Consumption and Change in Wealth for the Middle-Third Near-Retiree Household under the "Soft Landing" Scenario*




Note: The change in consumption reflects a percentage-point difference in cumulative growth rates between 2021 and 2023; whereas the change in financial wealth reflects the percent difference in 2025.
*Sources:* Authors' estimates from the *Survey of Consumer Finances* (2019) and survey data provided by Greenwald Research (2023).

**Appendix A: An Example of Inflation's Impact on Consumption**

Consider a working household that earns $100,000, pays $10,000 per year towards the mortgage, and saves 6 percent of its earnings in a 401(k). Using equation (1), expenditures in the first year can be written:

$$P_1 C_1 = 100{,}000 - 10{,}000 - 6{,}000 = 84{,}000 \tag{A1}$$

In the second year, assume that prices and earnings each grow by 4 percent, the mortgage payment stays constant, and the household maintains its 6-percent saving rate.[40] Then, expenditures become:

$$(1.04)P_1 C_2 = (1.04)100{,}000 - 10{,}000 - (1.04)6{,}000 = 87{,}760 \tag{A2}$$

While expenditures increase in the second year, prices have also risen. However, even after adjusting for the new price level, the household consumes more goods and services – equivalent to spending an additional $385 in the first year:

$$C_2 - C_1 = \frac{87{,}760}{1.04} - 84{,}000 = 385 \tag{A3}$$

Intuitively, the household has more purchasing power because prices and earnings rise in lockstep, but the required mortgage payment stays constant.

Conversely, assume instead that prices grow by 6 percent while earnings only grow by 4 percent. Then, the household must reduce its consumption by $1,208 (in year-one dollars):

$$C_2 - C_1 = \frac{87{,}760}{1.06} - 84{,}000 = -1{,}208 \tag{A4}$$

[40] 6 percent was the median employee contribution rate to Vanguard defined contribution plans in 2021 (Vanguard 2022).

Here, the declining importance of the mortgage payment is not enough to compensate for the fact that earnings lag prices.

## Appendix B: Methodology for Projecting Wealth in the Scenario Analysis

Our wealth projection begins with the 10-year Treasury bond, which is a key instrument in the valuation of most financial assets.[41]

*Projecting the 10-year Treasury bond:* We model the price of Treasuries as the present discounted value of future cash flows (coupon payments and return of principal). The key parameter is the yield, or discount rate. The market yield on Treasuries depends on three factors: 10-year inflation expectations, expected real GDP growth, and investors' taste for risk (which together determine the real return).

For the "permanent shock" scenario, inflation expectations slowly trend up from just over 2 percent in May 2021 to 4 percent by December 2025 (as the market takes time to integrate the fact that the Fed's inflation target has shifted). At the same time, the yield on the 10-year TIPS – a measure of the real long-term risk-free rate – increases from negative 1 percent to 1 percent. This results in an upward trend in the 10-year Treasury rate from about 1 percent in May 2021 to 5 percent by December 2025.

The "soft-landing" scenario uses actual market conditions from 2021 to 2023 – tracking the reported monthly yields for 10-year TIPS and 10-year Treasuries over that period, and calculating expected inflation as the difference between the yield on Treasuries and the yield on TIPS. Expected inflation is then projected to trend from December 2023 levels to the Fed's 2-percent target by December 2025. The yield on 10-year TIPS trends from December 2023 levels to 1 percent by December 2025. Ultimately, this results in the yield for 10-year Treasury going from December 2023 levels to 3 percent by December 2025.

As with the soft-landing scenario, the "recession" scenario uses actual market conditions from 2021 to 2023. We presume that – before the recession hits – inflation expectations continue to rise from 2023 levels to 3 percent, as the market begins to price in higher inflation. Similarly, the yield on 10-year TIPS stays elevated at 2 percent, producing a peak 10-year Treasury yield of 5 percent before the recession hits. Once a recession is triggered in December

[41] Most major bond indices hue closely to the maturity and duration of the 10-year Treasury. Stock valuations often rely on the 10-year treasury yield to construct discount rates to value future earnings and dividends. And, the yield on the 10-year Treasury is used as a base for mortgage rates, impacting home values.

2024, inflation begins to decline, and expectations slowly trend back down to the Fed's 2-percent target by December 2025. Similarly, the 10-year TIPS rate trends downward from peak to just over 1 percent, which results in the 10-year Treasury rate declining from peak to just over 3 percent.

*Projecting households' fixed-income investments:* Once we have the Treasury yield, projecting the value of households' fixed-income investments is relatively simple. We assume fixed income investments are held in a bond fund similar to Vanguard's Total Bond Market Index Fund (which is the largest fixed-income component of Vanguard's Target Date fund). As noted above, the aggregate holdings of Vanguard's index closely resemble the features of a 10-year Treasury bond.[42] Hence, we model the change in the value of the index as if it were the change in the value of a 10-year Treasury.[43]

*Projecting the value of households' stock holdings:* We use the standard Gordon formula to project the value of stock holdings over time:

$$P_t = \frac{D_{t+1}}{(R-G)} \tag{B1}$$

Where $P_t$ denotes the price of a stock in time $t$, $D_{t+1}$ is the expected dividend in the following period, $R$ captures the expected long-term rate of return on stocks, and $G$ is the expected growth rate of earnings.

We assume that the expected return on stocks ($R$) equals the nominal yield on 10-year Treasuries plus a risk premium of around 4 percent. In theory, the risk premium should vary depending on expected dividend growth: periods of high expected growth generally follow recessions when investors are also highly uncertain about the future. However, investors' taste

[42] For example, in August 2023, Vanguard's fund had an average maturity of 8.9 years and duration of 6.5 years (compared to 7 for the 10-year Treasury). See https://investor.vanguard.com/investment-products/mutual-funds/profile/vbtlx#portfolio-composition.

[43] Specifically, at the start of the projection period (January 2021) we presume the index consists of a single 10-year Treasury bond with a coupon payment equal to the market yield on 10-year Treasuries as of January 2021. In the next period, we presume the change in the value of the index is equal to the change in the value of the bond due to the new prevailing interest rate. We also presume the index sells the existing bond at the new value and uses the proceeds to buy a new 10-year bond with a coupon payment equal to the prevailing interest rate. Then, this new bond is used to calculate the change in the index over the next period.

for risk is hard to predict, so we simply assume that dividends track GDP and investors require a relatively constant risk premium relative to the 10-year Treasury.[44]

*Projecting house prices:* Glaeser, Gottlieb, and Gyourko (2010) simulate how a one percentage-point increase in the real interest rate impacts house prices.[45] The paper suggests that a one-percentage-point change in the real interest rate would reduce real house prices by between 7 and 11 percent, with metropolitan areas that have limited supply and high demand showing greater interest rate sensitivity.[46] For this analysis we assume that house prices have an interest rate sensitivity of 9 percent.

*Projecting cash and "other" assets:* Cash is assumed to have zero growth. For the top wealth tercile, "other" assets are presumed to be mostly business assets that grow with projected GDP. For the bottom two terciles, "other" assets are presumed to be mostly non-business assets that have zero growth.[47]

[44] The Congressional Budget Office provides long-run estimates of potential GDP. We estimate GDP by applying the output gap to projected potential GDP. R is based on the monthly long-term expected return for the S&P 500 from Damodaran (2023). G is then solved for by combining R with the S&P 500 index value and the index's notional dividend. Ultimately, R and G averaged 8 percent and 3.5 percent, respectively, since 2008. The average R and G serve as the baseline expectation for investors and only shifts in the recession scenario, where we presume that R trends to 8.5 percent prior to the recession (to account for higher expected nominal returns and risk premiums by investors) and then back down to 8 percent after the recession.

[45] The canonical user-cost model (Poterba 1984) shows how the ratio of rent to house price depends on the mortgage interest rate. Unfortunately, however, empirical studies have long noted that prices are much less sensitive to interest rates than predicted by the model (see Liu et al. 2021 for a review). One issue is that the canonical model ignores homebuyers' forward-looking expectations about future interest rates. Glaeser, Gottlieb, and Gyourko (2010) propose an extension to account for this issue.

[46] Importantly, the paper concludes that interest rate changes can only explain about 10 percent of the observed change in house prices. Other research suggests that the strength of the labor market also determines demand for housing. See, for example, Baffoe-Bonnie (1998) and Sommer, Sullivan, and Verbrugge (2013).

[47] Specifically, the analysis presumes 100 percent of "other" assets are miscellaneous for the bottom tercile, 95 percent are miscellaneous for the middle tercile, and 25 percent are miscellaneous for the top tercile.

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