Photo: iStock/perinjo

Baby Boomers vs. Millennials Through Monetary Policy?

Monetary policy affects retired and working households differently. To maintain its commitment to stable prices and maximum employment in an aging society, the Fed may need to rethink monetary policy.

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BY MAKOTO NAKAJIMA

In many countries, including the U.S., the population is aging and will continue to do so as fewer children are born and medical advancements extend average life expectancy. The proportion of people age 65 and above in each of the (generally rich) Organisation for Economic Co-operation and Development (OECD) countries has been increasing over the past several decades (Figure 1). Across all OECD countries, less than 10 percent of the population was older than 65 in 1970, but that percentage had steadily increased to 17 percent in 2018. Although the U.S. is aging at a slightly slower pace than other OECD countries, the change in its demographic composition is still substantial. In the U.S., the share of the population age 65 and above increased from 10 percent in 1970 to 16 percent in 2018. The proportion of individuals age 65 and above in the U.S. is projected to rise to more than one-fifth by 2050.[1]

Does this aging trend affect the way monetary policy is conducted? Potentially, yes.

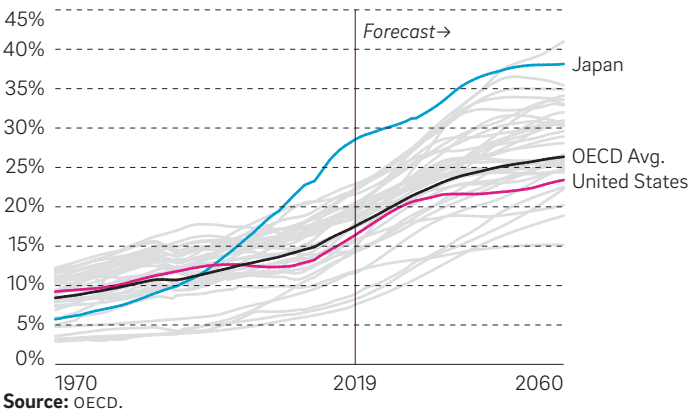
Central banks typically conduct monetary policy using one primary policy tool: the policy interest rate. In the case of the

FIGURE 1

Elderly Population Increasing Fast in OECD Countries

Other countries age faster, but the U.S. is nonetheless experiencing substantial aging.

Percentage of people age 65 and older in each OECD country, actual (1970–2018) and projected (2019–2060)



Source: OECD.

Federal Reserve, its policy interest rate is a target range for the effective federal funds rate. Since they have only one primary policy tool, central banks focus on only a few important goals. The Fed, for example, has just two policy goals: achieving maximum employment and maintaining stable prices. It strives to use the policy interest rate to balance the two.[2] The Fed maintains that its dual goals of maximum employment and stable prices benefit everyone—especially the less-favored segments of society, which particularly benefit from a better labor market. However, to successfully balance these two goals, the Fed must consider how its policies will affect a diverse society, one where people differ in terms of age, income, wealth holding, race, education, and so on. When the composition of society changes significantly, the Fed needs to reconsider how to maintain that balance. For example, if more people are retired, the Fed might want to put less emphasis on maximum employment. In this article, I examine how people in different stages of life differ in terms of income and wealth, how the young and the old may prefer different monetary policies, and how the aging of society potentially affects the conduct of monetary policy because of the differences between the young and the old.

An Overview of Age, Income, and Wealth

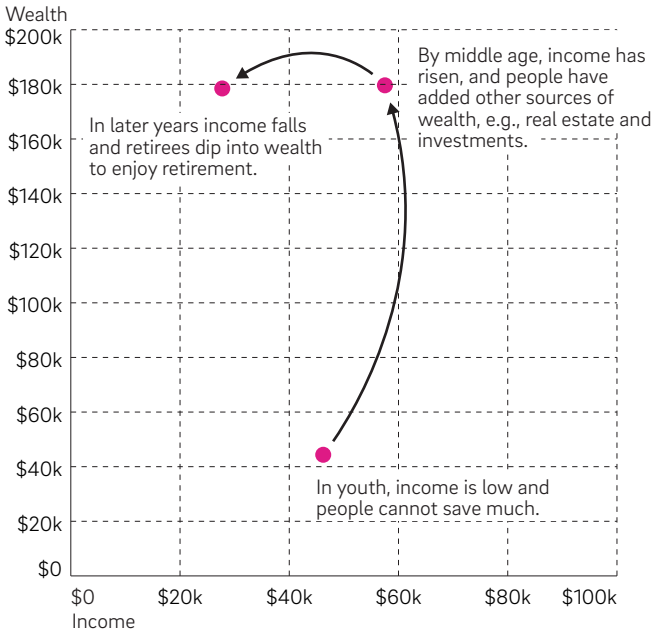
Young (age 25-45), middle-aged (46-65), and old (66 and above) households differ in terms of income and wealth (Figure 2).[3] The median income is hump-shaped over the three life stages: It is $46,000 among the young, increasing to $58,000 among the middle-aged, and tapering to $28,000 in old age (Figure 3).[4] Although it is not the focus of this article, there is also a large dispersion of income within each age group.[5] The composition of income shifts from wage income to transfers (Social Security and other pension income) as households age.[6]

As with income, wealth holding increases from youth to middle age as households keep accumulating wealth, but it stays high among the old (Figure 4).[7] The median wealth is $44,000 when young, rising to $180,000 during middle age, and staying at $179,000 after age 65. In terms of composition of wealth, housing is the most important single item in all age groups, but households typically take out a mortgage to buy a house only when they are young or middle aged.[8] As households age, they repay mortgage debt, and the importance of financial assets—in particular, nonequity financial assets—increases.

FIGURE 2

The Mix of Wealth and Income Shifts from Youth to Old Age

Median wealth and income, young, middle-age, and old households, 2004



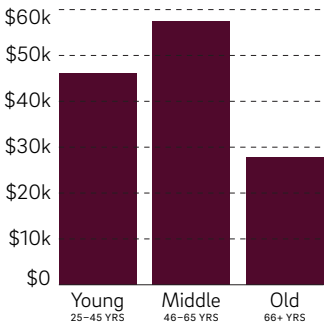
Source: Survey of Consumer Finances.

FIGURE 3

Median Income Peaks During Middle Age

Most older households are retired and earn less.

Median income by age group, 2004



Source: Survey of Consumer Finances.

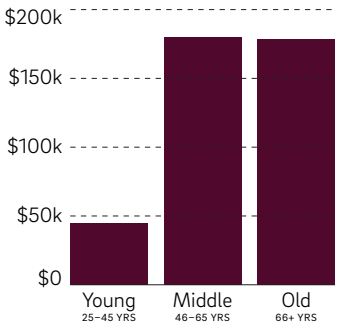
Note: Age represents age of the head of the household.

FIGURE 4

Young Have Little Wealth

Young households lack rainy day funds to sustain expenditures when income declines.

Median wealth by age group, 2004



Source: Survey of Consumer Finances.

Note: Age represents age of the head of the household.

Young Households (Figure 5)

Relying on Wage Income

Young households have typically just started their working life and their income tends to be lower than the income of middle-aged households. In terms of sources of income, they overwhelmingly rely on income from work: Wage income represents 95 percent of total income for the young. Since the young rely more on wage income, they are more likely to be affected by a monetary policy action that stimulates the labor market (raising wages or lowering the unemployment rate). This channel is more important for the young because the unemployment rate among the young tends to be higher and volatile. For example, during the Great Recession, the overall unemployment rate more than doubled from below 5 percent to 10 percent, which was high. But the unemployment rate for those 16-24 years of age rose from 10 percent to almost 20 percent.

For median young households, only 4 percent of income comes from transfers, but lower-income young households rely more on transfer income from the government. Because they are adjusted for inflation, government transfers do not respond to monetary policy, so these households are probably less strongly affected by monetary policy.[9] In contrast, only 2 percent of income for the median young households is related to business and financial income, whereas higher-income households earn more from business and financial income, which are sensitive to monetary policy. However, these nonwage income sources are relatively minor for median young households, who rely overwhelmingly on income from work.

Living Hand to Mouth

Since most households start their working life with little wealth, it is not surprising that young households own less wealth than other age groups. Therefore, they have less savings (that is, a smaller rainy-day fund) to sustain expenditures when their income declines. They could use credit cards or other forms of borrowing to supplement their income, but young households may have not yet established the solid credit history needed to gain access to credit. These young households are more likely to live month to month, or hand to mouth. Therefore, these hand-to-mouth young households, typically lacking a rainy-day fund or easy access to credit, could benefit from a better labor market in yet another way: If monetary policy improves the labor market (and wage income) in a downturn, the hand-to-mouth young do not need to cut as much expenditures. If, however, a downturn is not mitigated by a monetary policy action, the hand-to-mouth young must unwillingly cut expenditures when they experience an income cut or a spell of unemployment, whereas other households with savings or credit cards can sustain expenditures even if their income declines.

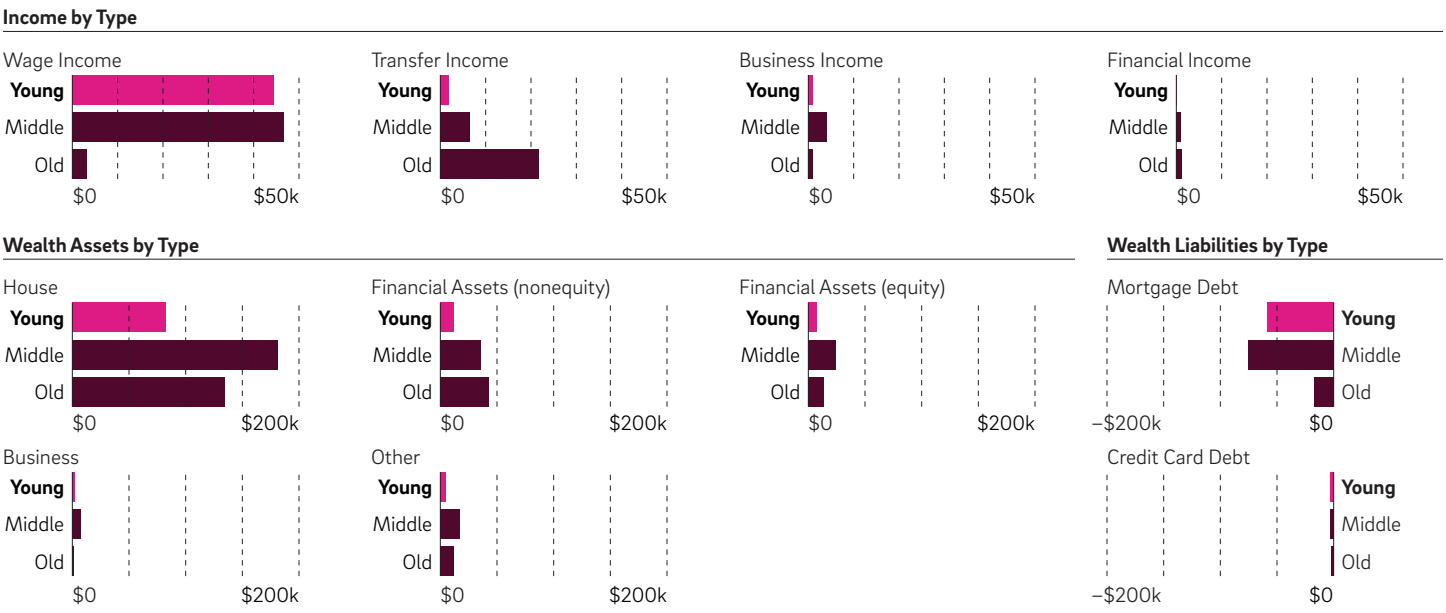
Future Homebuyers

At the beginning of their economic life, households usually don't own their homes, either. However, young households are often saving for the down payment on their first house. If monetary policy pushes up house prices, they need to either save more for the down payment to buy the same house or delay their home purchase. In other words, the young as future homebuyers might suffer from higher house prices. This is somewhat counterintuitive: People often assume that it is a good thing when monetary policy raises house prices, because higher house prices make homeowners wealthier, or at least enable them to borrow more using home equity. But renters may suffer from the same increase in house prices.[10]

FIGURE 5

The Young Are Very Reliant on Wage Income

Composition of income, composition of wealth, mean of each age group's 40th to 60th percentiles, 2004



Source: Survey of Consumer Finances.

Note: Age represents age of the head of the household.

Middle-Aged Households (Figure 6)

Financially Active

Typically, individuals earn their highest income during middle age, so this is when many middle-aged households buy a home and start saving for retirement. Middle-aged households earn more than young households because they have accumulated skills and experiences or climbed the career ladder. They earn more than the old, many of whom are retired. The median middle-aged get the majority (81 percent) of their income from wages. The percentage is lower than for the young, because middle-aged households have more income from other sources, such as business and financial returns. This is especially true for middle-aged households with a higher income.

Middle-aged households on average hold the largest amount of wealth among the three age groups. Although both the young and the middle-aged are typically working, there are stark contrasts between the two working periods. While young households tend to be in less stable employment and have just started saving, possibly for buying a house, middle-aged households are more likely to be in more stable employment, and many have accumulated some wealth.[11] Also, the middle-aged probably have a longer credit history and can use credit more easily than the young. These characteristics make them less likely to be hand-to-mouth than many young households are.

Housing and Mortgages

When households are in middle age and have the highest amount of wealth, housing and mortgage debt comprise the largest part of their portfolio. Eighty percent of middle-aged households are homeowners, compared with 63 percent among the young. (Among the young, the number is higher for those approaching middle age.) And they tend to carry a large balance of mortgages. In other words, they are taking a leveraged position with mortgage debt. This is especially common among relatively young and lower-wealth households: They often have just purchased their house, taking a large mortgage, or they cannot repay their mortgage and accumulate home equity.

When they own a house and hold a large mortgage balance, a monetary policy action that affects the value of housing and mortgages has a relatively large effect on middle-aged homeowners. Here's why: If a middle-aged homeowner has a large fixed-rate mortgage (FRM), and mortgage interest rates go down as a result of a monetary policy action, this household can benefit by refinancing and resetting its mortgage interest rate to the lower rate. This lower mortgage rate could free up some money for middle-aged homeowners to increase their expenditures. Interestingly, this channel is asymmetric. If the mortgage interest rate rises, possibly due to monetary policy tightening, homeowners can stick with their existing FRM and remain unaffected by the higher mortgage rate.

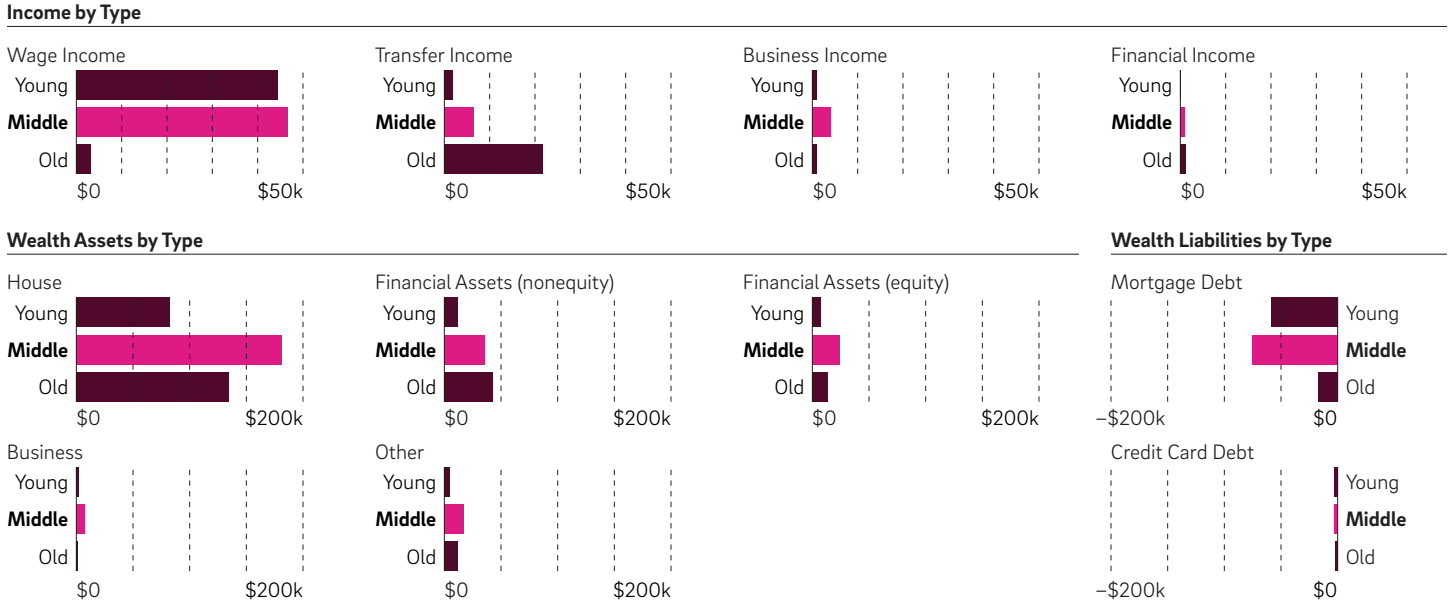
How many homeowners with FRMs respond to a lower interest rate? That depends on the interest rate of existing mortgages among homeowners. If many homeowners have a mortgage with a high interest rate, lowering the policy rate could encourage them to refinance their mortgage and benefit from a lower interest rate. In other words, the effect of monetary policy action through mortgages depends on the recent history of interest rates.[12] This argument mainly applies to FRMs, which is the most common choice for homeowners in the U.S., but it could also apply to adjustable-rate mortgages (ARMs)

*See **Fixed-Rate vs. Adjustable-Rate Mortgages.***

FIGURE 6

The Middle-Aged Are Also Reliant on Wage Income, but Actively Accumulating Housing and Financial Wealth

Composition of income, composition of wealth, mean of each age group's 40th to 60th percentiles, 2004



Source: Survey of Consumer Finances.

Note: Age represents age of the head of the household.

when the rate is adjusted infrequently, such as every year or every five years.

Because many middle-aged households are homeowners, they could benefit when an accommodative monetary policy positively affects house prices. But things might not be so simple. First, buying and selling a house is costly, financially and possibly psychologically. If middle-aged homeowners do nothing when their house becomes more valuable, house prices have no immediate effect on those households. Second, if they are planning to buy a bigger house to live in, possibly because the family is expanding, they suffer from higher house prices, just like younger households saving for the down payment on their first house.

Liquidity of Assets Held

The fact that buying and selling a house is costly leads to another consideration: liquidity. Imagine a middle-aged homeowner who is unwilling or unable to sell or refinance their house, cannot find a good house to move to, or cannot easily find a buyer. In that case, their house is an illiquid asset, and they cannot use the value of the house as a rainy-day fund even if the house is valuable. In other words, although the homeowner has a house, the situation is similar to that of a young household without any savings, in the sense that neither has liquid assets, which are easily used to supplant lost income. The liquidity issue is not limited to housing. Middle-aged households also accumulate wealth in 401(k), Roth IRA, and other retirement saving plans. These retirement saving vehicles are often costly to liquidate or borrow against, making middle-aged households with these assets like homeowners who cannot liquidate their house.

Because middle-aged homeowners who cannot easily sell their house or liquidate their retirement savings are similar to young hand-to-mouth households (who do not have savings), Greg Kaplan, Giovanni Violante, and Justin Weidner name these middle-aged households "wealthy hand-to-mouth."[14] If monetary policy action improves labor market conditions and their income increases, they could benefit from that action–just like young households without savings–by increasing their expenditures, which they weren't able to do previously because of the illiquidity of housing or retirement savings.

Indeed, recent empirical research finds that monetary policy affects the economy through its effect on mortgages. Moreover, research suggests that this effect is amplified because of the illiquidity of housing assets.

*See **Effects of Monetary Policy Through Mortgages: What the Data Say**.*

Fixed-Rate vs. Adjustable-Rate Mortgages

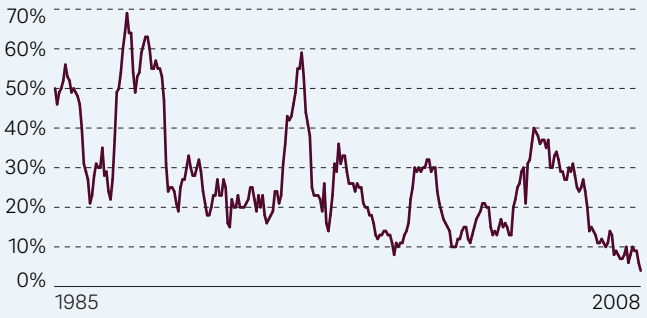
Figure 7 shows the percentage of all mortgages that were ARMs from 1985 to 2008. As Emmanuel Moench, James I. Vickery, and Diego Aragon at the Federal Reserve Bank of New York discuss, the share fluctuates substantially over time, reaching the highs of 60 to 70 percent in 1988 and 1994 but falling significantly to the record lows leading to the Great Recession.[13] The authors use a separate data series (the Lender Processing Service) to show that the percentage remained below 10 percent until 2010. They argue that low long-term interest rates help account for the declining popularity of ARMs.

FIGURE 7

The Mortgage Market Shifted Away from ARMs Prior to the Great Recession

Low long-term interest rates may account for the declining popularity of adjustable-rate mortgages.

Percentage of all mortgages that have adjustable rates, 1985–2008



Source: Federal Home Finance Agency, Monthly Interest Rate Survey.

Note: The data include all conventional single-family mortgages on both newly built homes and existing homes. The data were discontinued in 2008.

Effects of Monetary Policy Through Mortgages: What the Data Say

Although detecting monetary policy's effect on different groups of households is far from easy, a recent study finds that homeowners with mortgages are significantly affected by monetary policy. Using data from the UK and the U.S., James Cloyne, Clodomiro Ferreira, and Paolo Surico (2020) look at how monetary policy actions affect expenditures by various households. They find that homeowners with a mortgage increase consumption expenditures significantly in response to a policy rate cut, while homeowners without a mortgage do not adjust their expenditures at all. Renters also increase their spending but less so than mortgage holders. They argue that the stronger response of mortgage holders is due to the combination of the lower expenses associated with having a mortgage and their being wealthy hand-to-mouth.[15]

However, the empirical research about the effects of monetary policy on diverse households is generally limited and inconclusive, because there is no easily accessible high-quality and high-frequency data on individual consumption expenditures. In addition to availability of microdata, there are three issues that make it hard to cleanly isolate the effect of a monetary policy action. First, the government might implement a fiscal stimulus while an accommodative monetary policy action is implemented. This makes it difficult to distinguish the two policy effects. Second, if consumers and firms expect a monetary policy action, they might respond before the action is taken, and not when the action is taken. In that case, consumption data after a monetary policy action does not reveal the response of consumers to a monetary policy action, which is something we want to observe. Finally, at least in the U.S., there are generally only eight possible monetary policy changes per year, and we can use data only up to 2007 (after which the policy rate became zero).[16]

Older Households (Figure 8)

Relying on Pension Income

Older households earn less than middle-income households because most older households are retired. This is why typical households save during their working life, especially during their peak earning years, as they prepare for life after retirement. There is a striking contrast between old households and those of working ages (young and middle-aged) in terms of sources of income. The majority (78 percent) of income for median older households is transfer income, which mainly consists of Social Security benefits and other pension income. Meanwhile, only 11 percent comes from wage income, because few older households continue to work after age 65. Older-household income is lower than that of the middle-aged because Social Security benefits and pension income are typically lower than wage income before retirement. Business and financial income make up the rest. Although business and financial income is more important for higher-income older households, the large share of transfer income is common across different income groups.

How does monetary policy affect retirement income? It depends on the type of retirement income. Social Security and defined benefit (DB) pensions are largely unaffected by economic conditions, because the amount of benefits is predetermined. Moreover, Social Security benefits are adjusted for the cost of living, which means that the amount of benefits is adjusted to reflect changes in the inflation rate, nullifying the effects from inflation. Some DB pensions offer cost-of-living adjustments as well.

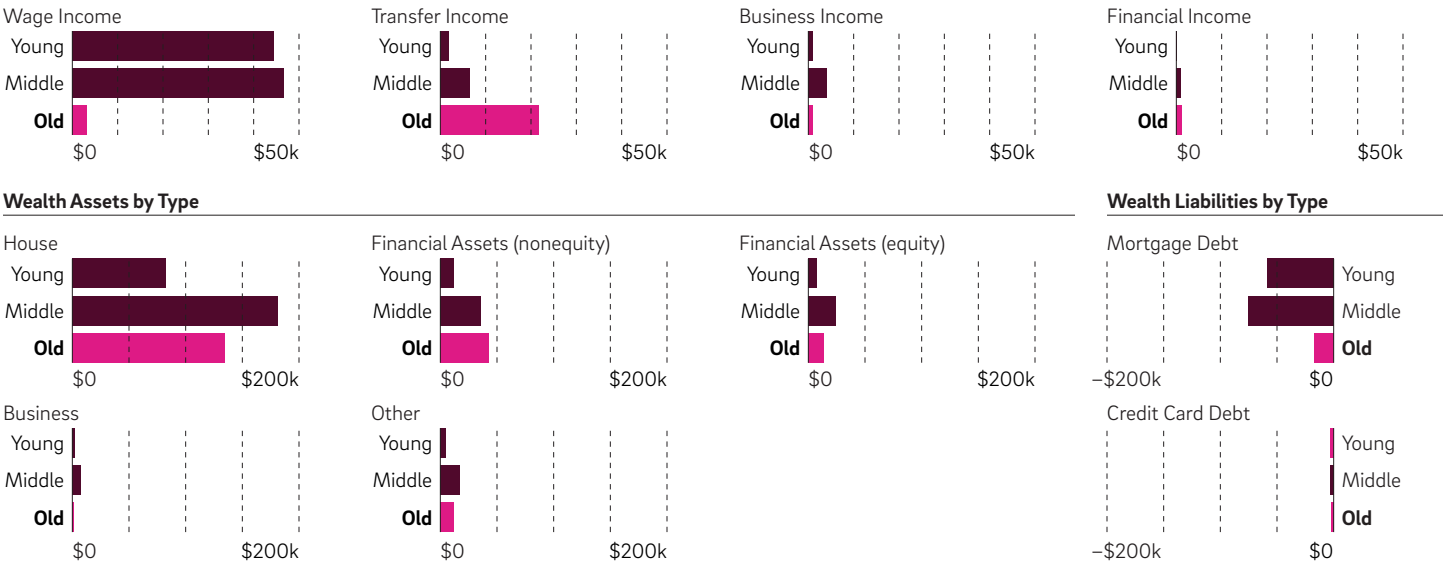
However, defined contribution (DC) pensions and individual retirement accounts (IRAs) are becoming more widely used. For both DC pensions and IRAs, the effect of monetary policy depends on how they invest money across different asset categories. If DC pensions and IRAs invest mostly in equities, the performance of equity markets affects pension income. Thus, monetary policy could affect income from DC pensions

*See **Shifting Composition of Retirement Savings**.*

FIGURE 8

Older Americans Are Heavily Reliant on Transfer Income

Composition of income, composition of wealth, mean of each age group's 40th to 60th percentiles, 2004



Source: Survey of Consumer Finances.

Note: Age represents age of the head of the household.

and IRAs, insofar as monetary policy affects equity returns. If DC pensions or IRAs invest mostly in bonds, retirement income is affected by returns from bonds. How monetary policy affects the returns of bonds depends on various factors. Generally, a lower interest rate pushes up prices of bonds. On the other hand, if a rate cut causes inflation, the value of nominal bonds decreases. In the end, there is no single answer to the question of how monetary policy affects the income of the retired.

Housing Wealth Effect

Older households hold as much wealth as middle-aged ones, but there is a shift in the composition of their wealth. First, older households hold only a small balance of their mortgage outstanding (9 percent of wealth), as they are almost finished repaying their mortgages. Second, housing is still the biggest item (73 percent) in their portfolios. This means that a typical older household owns its house free and clear. Third, there is a shift from equity to nonequity financial assets as households transition to retirement. However, there are differences among wealth groups. Although middle-wealth and low-wealth older households typically shift their portfolios to nonequity financial assets, top-wealth older households keep a significant fraction of their portfolios in equity and business assets.

Since most older individuals are no longer working and have mostly repaid their mortgages, monetary policy actions do not directly affect older households through the labor market (unlike the young) or mortgages (unlike the middle-aged). Instead, older households are more likely affected through prices of assets, especially housing. Unlike younger cohorts, they are more likely to downsize (that is, move into a smaller house, switch to renting, or move into a nursing home). Therefore, they benefit more from an increase in their home values as they can cash in the higher value of their houses when they sell. Indeed, they could increase their expenditures even before selling, anticipating the income they expect to receive when they sell their houses. This is called the wealth effect.

Importance of the Time Horizon

Although the wealth effect applies to equity prices, too, many older households, especially not the wealthiest ones, own less equity after liquidating their retirement assets, and thus the effect of monetary policy through equity prices is limited among the old. This reduced exposure to equity is consistent with a simple portfolio allocation theory, which says that elderly households should shift their asset portfolios from risky assets like stocks to safer assets, since they do not have a long time horizon (that is, remaining life) to average out the higher-on-average but volatile returns of risky assets. However, depending on what kind of safe financial assets are held, how older households are affected by monetary policy differs. A higher interest rate is usually considered a form of monetary policy tightening. But if elderly households invest more in interest-bearing assets such as savings accounts as they move away from equity, they could benefit from a higher interest rate. On the other hand, if they invest in bonds, they benefit from a looser monetary policy, because bond prices rise in response to a lower interest rate.

All these channels could affect the expenditure behavior of older households more strongly than of younger households because older households have a shorter time horizon. For example, if a younger and an older household each receives $100, the latter is likely to spend the money faster because it has less time to spend it.[17] Indeed, according to recent empirical research, consumption by older individuals responds more strongly to an accommodative monetary policy action.[18] This research indicates that, although a lower interest rate may hurt those who own interest-bearing assets, the effect isn't strong enough to counteract the positive effects on asset values.

Shifting Composition of Retirement Savings

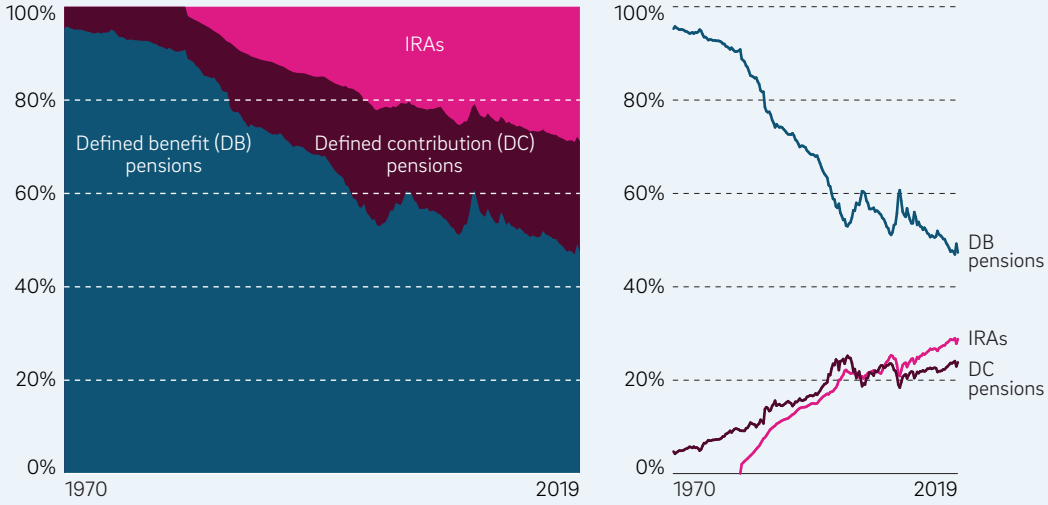
In the U.S., the composition of retirement savings except for Social Security has been shifting consistently from DB pensions to DC pensions and IRAs (Figure 9, data depicted two ways). In 1970, almost all retirement savings were DB pensions, but many employers since then have switched to DC pensions. In addition, since 1981, IRAs have become an important part of retirement savings. As a result, the proportion of DB pensions shrank from 95 percent in 1970 to 47 percent in 2019, and DC pensions (24 percent) and IRAs (29 percent) had become a large part of retirement savings.

FIGURE 9

Composition of Retirement Wealth

The decline in defined benefit pensions may expose more older households to asset price risks.

Percent of retirement funds, by category, 1970–2019



Source: Flow of Funds, Federal Reserve Board.

Note: The data include pensions from the private sector and from the federal, state, and local government sectors.

The shift from DB to DC pensions is even more dramatic in the private sector, where the fraction of DB pensions (excluding IRAs) declined from 83 percent to 34 percent, whereas DB pensions are still prevalent in the public sector. This implies that older households could be more exposed to asset price risks, especially when they invest in riskier assets under a DC pension plan or an IRA.

Taking Stock

Let's review the differences across age groups discussed so far in this article. Young households are affected by monetary policy mainly through its effect on the labor market and wage income, since they do not own much wealth. They could particularly benefit from a monetary stimulus in a downturn because they are more likely to live hand to mouth.

Because most middle-aged individuals are homeowners with mortgages, a monetary policy action will have an important effect on them. A policy rate cut could allow them to refinance at a lower rate and then use the savings to support higher spending. Empirical research finds that spending by mortgage holders responds strongly to rate cuts, indicating that these households are likely to be wealthy hand-to-mouth. If they are not, a change in the interest rate is not likely to affect the spending behavior of mortgage holders.

Finally, retired households have a shorter time horizon and are typically dissaving their wealth. Therefore, they respond to changes in the value of their houses more strongly than other age groups. On the other hand, the effect of monetary policy through retirement savings depends on the type of retirement savings, the composition of which has been changing over time, and on the portfolio choice decision of each retiree.

Aging and Monetary Policy

As a population ages, more households are retired.[19] Even though the two goals of monetary policy remain intact, as long as the monetary authority aims to take care of households in different stages of life equally, monetary policymakers might want to pay more attention to older retired households as the population ages. And retired households are affected differently by monetary policy. This has three implications for monetary policy.

First, since older households are mostly affected by the prices of the assets they hold, especially housing, more attention needs to be paid to the effect of monetary policy on the price of housing and financial assets. In other words, even though maximum employment remains one of the Federal Reserve's two goals, a shift of emphasis from the labor market (which is important for younger households) to the asset market (which is important for older households) might be necessary as the population ages.

Will this shift how monetary policy is conducted? Not necessarily. If older retired households benefit from the effects of monetary policy on asset markets, exactly when younger working households benefit from the effects on the labor market, shifting some of the emphasis from the labor market to the asset market does not imply a drastic change in the way monetary policy is conducted.

Second, this fortunate coincidence might not always be the case. When a monetary authority is worried about the economy overheating and inflation, it might want to increase its policy rate. But it might want to be more cautious in an aging society, because a rate increase may lower the prices of retired households' houses and financial assets, thus hurting a large number of retirees. Also, if a monetary policy action affects the asset market more strongly than the labor market, it could benefit older households, who are owners of assets, at the expense of young households, who are future buyers of assets.

Third, how monetary policy affects retired households depends on the composition of their assets. For retirees with housing and equity, monetary accommodation benefits them as well through its effects on the prices of housing and equity. On the other hand, for retirees investing in savings accounts, a lower interest rate hurts their income.

Broader Implications

In this article, I focused on how differences in income and wealth across age groups affect monetary policy in an aging economy. However, aging has other, broader implications for monetary policy. For one, as documented in Lukasz Drozd's 2018 *Economic Insights* article, aging seems to lower interest rates. Because middle-aged and older households hold more savings, and people save more when faced with longer life expectancy and rising health expenditures, total savings in a society increases as the population ages. When there is more savings available, the price of savings—that is, the interest rate—goes down.[20] This is one reason why interest rates have trended down in most rich countries, including the U.S. So long as inflation remains low, the nominal policy rate could stay close to zero, leaving a central bank less room to lower its policy interest rate even if it wants to stimulate the economy.[21]

Another, related implication is that aging might lower the interest rate of safer assets such as government bonds, relative to riskier assets such as stocks. This could cause a shift in portfolio allocation, most notably for older asset holders, and affect monetary policy indirectly, since the monetary authority needs to take into account such a shift in portfolios.

Finally, monetary policy in the U.S. could be affected indirectly. First, the aging of a population may also affect fiscal policy—via a public pension system or subsidies to private retirement savings, for example—and how the fiscal authority responds to aging affects monetary policymaking as well. Second, the whole world, including China, is rapidly aging. Because financial markets are globally connected, this could affect how monetary policy affects people through financial markets.

The U.S. and other high-income countries are aging, and an aging population could affect monetary policy in many ways. This aging's potential impact on monetary policymaking has been recognized by central bankers such as Bank of England Chief Economist Charles R. Bean, who made a speech on this topic at the Jackson Hole Symposium in 2004. One of the things Bean emphasized is that the effects of aging, including its effects on monetary policy, are gradual. Moreover, the U.S. is aging more slowly than other high-income countries, such as Japan and Italy. Maybe the U.S. has a bit more breathing room. However, because of these indirect channels, the breathing room could be smaller than it seems. The whole world is aging, and many countries are aging more rapidly than the U.S. Since we live in an interconnected world, the effects of aging in other countries could force U.S. monetary policy to respond even if the aging process in the U.S. is more gradual. EI

Notes

1 The source for these figures is OECD.Stat, population projections.

2 The Federal Reserve Act states that the Federal Reserve "promote effectively the goals of maximum employment, stable prices, and moderate long-term interest rates." This is commonly referred to as the Federal Reserve's dual mandate of maximum employment and price stability.

3 I look at households instead of individuals because it is difficult to measure wealth for each individual within a household. To calculate the income of a household, I sum the incomes of all members within the household.

4 Income here includes all kinds of income, such as wage income, financial income, rent income, income from business, and transfers from the government. The data are from the Survey of Consumer Finances, which is compiled by the Federal Reserve Board of Governors.

5 My Philadelphia Fed *Business Review* article "The Redistributive Consequences of Monetary Policy" looks at how monetary policy causes redistribution among different income groups, especially when there is a large dispersion in income.

6 In computing the composition of income, I take the 40th–60th percentiles of households in each income group and calculate the average amount for each of the income categories. This is to avoid looking at the income composition of only one household with the median income.

7 Wealth includes both financial wealth (such as bank account balances, stocks, bonds, mutual funds, and retirement accounts) and nonfinancial wealth (such as housing, businesses, and cars), net of all kinds of debt (including mortgages, credit card balances, college loans, and car loans).

8 See footnote 6 for how this figure is constructed. Debt is represented with negative values.

9 Government changes its transfer policy often in sync with monetary policy action, since both are used to cope with a recession, but this is different from the government responding to a monetary policy action.

10 In my *Business Review* article "The Diverse Impacts of the Great Recession," I make a similar argument about the Great Recession, namely, that the large decline in house prices during the recession made housing affordable for young households. Of course, young households might have suffered in terms of income as well, so the recession's overall effect on the young is ambiguous.

11 But note that losing a job has more serious income-related consequences for middle-aged workers. Johnson and Monnaerts (2011) find that when older workers lose their jobs, they take longer than their younger counterparts to become reemployed, and when they do find work, they generally experience a decline in wages.

12 Eichenbaum, Rebelo, and Wong (2019), among others, make this point.

13 The data series was discontinued in 2008.

14 See their 2014 article.

15 The contrast between homeowners with mortgages, homeowners without, and renters is stronger with durable-goods expenditures. After an unanticipated cut in the policy rate, homeowners with a mortgage increase their purchases of durable goods by up to 1.2 percent, while homeowners without debt do not change their expenditures. Renters' maximum response is 0.8 percent. With nondurable goods and services, homeowners with mortgages increase their expenditures by up to 0.4 percent, while the response of homeowners without mortgages is negligible. Renters respond like mortgage holders in terms of nondurable goods and services. Wong (2015) confirms this finding: Middle-aged home-owning households with mortgages increase their expenditures significantly when the policy rate is lowered.

16 While the policy rate was near zero (the "zero-lower-bound" period), the FRB used so-called unconventional monetary policies, such as asset purchases ("quantitative easing"), and communication to affect expectations of future interest rate policy ("forward guidance"). Their policies could, and perhaps did, work as a substitute for policy rate adjustments used in normal times, but there is no consensus about the strength of their impacts, or about how to convert the impacts into changes in policy rates, which makes it difficult to use the data during the zero-lower-bound period together with the data from the normal period. See, for example, Rudebusch (2018).

17 The desire of older households to leave bequests could weaken this argument.

18 See Berg, Curtis, Lugauer, and Mark (2019), who stress the importance of the shorter time horizon and strong wealth effect for older households.

19 As individuals live longer, the typical retirement age has been raised in many rich (and older) countries, but this increase in the retirement age has not kept pace with the increase in life expectancy.

20 To be more precise, the real (controlled for inflation) interest rate declines.

21 Rudebusch (2018) discusses the Fed's so-called unconventional monetary policy during the period when the nominal policy rate is close to zero.

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