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Stocks in the Household Portfolio: A Look Back at the 1990s

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The growing prominence of stocks as a household asset in the 1990s encouraged the view that the United States had become a nation of zealous investors alert to every market development and eager to acquire new stocks. Yet an analysis of the factors behind the rise in the household equity share suggests that exceptionally high returns on stocks—rather than aggressive investment behavior—accounted for much of the increased importance of stocks.

The 1990s were remarkably good to U.S. stockholders. Stock returns for the decade averaged 16.1 percent per year, almost twice the historical average of 8.7 percent. The decade began modestly enough, yielding a 5.9 percent annual return to equity from 1990 to 1995, but it finished exceptionally strong, with an astonishing 26.3 percent average annual return from 1996 to 1999. As returns mounted over the decade, the household sector's stock holdings grew from $2.6 trillion to $12.6 trillion, and the composition of household assets shifted dramatically toward stocks. According to the Federal Reserve's Flow of Funds Accounts, in 1990 stocks made up 13 percent of the household sector's "portfolio"—the sector's holdings of equity, real estate, transaction accounts, and other assets. By the end of 1999, stocks' share had swelled to 33 percent, with much of the gain coming at the expense of real estate.

These statistics have created the impression that, over the course of the 1990s, the behavior of U.S. stock market investors became significantly more aggressive. In this view, Americans increasingly spent time tracking the movements of market indexes, studying stock price-to-earnings ratios, and expanding their investment portfolios. Moreover, as the decade progressed and market performance broke earlier records, ever-larger numbers of Americans grew eager to join "Wall Street's long-running party."[1]

In this edition of *Current Issues*, we investigate the reasons for the increased importance of stocks as a household asset in the 1990s. We give particular atten-tion to the possibility that a change in investor behavior largely explains this development, but we also consider other factors that may have prompted a shift toward stocks—changes in the age and education distribution of the population, the restructuring of retirement plans, and the large returns on stocks relative to other assets.

Our analysis shows that behavioral change, in fact, played a rather limited role in the shift toward stocks. Age and education shifts and the advent of defined-contribution retirement plans also had a modest effect. Most influential in boosting the importance of stocks as a household asset were the high returns on equity investments. These returns reflected the independent workings of the market and owed little to investor initia-tive. Thus, in clear contrast to the popular view of U.S. households as aggressive portfolio managers, our evidence suggests that the typical American investor was largely the passive beneficiary of a bull market.

Comparing Aggregate and Average Equity Shares
Before we investigate why stocks have become a more important household asset, we need to choose a mea-sure of their increased importance. The Flow of Funds estimate cited in our introduction suggests that equities' share of household assets rose from 13 percent to 33 percent over the course of the decade—a striking 20-percentage-point leap. Significantly, however, the equity share reported in the Flow of Funds data is an *aggregate* measure, representative of the entire house-hold sector's exposure to the stock market, but not the exposure of the typical household.

In a previous edition of *Current Issues* (Tracy, Schneider, and Chan 1999), we explained why aggregate statistics on the composition of household assets give a misleading picture of the average household's portfolio. The aggregate equity share in the Flow of Funds data is calculated by dividing total corporate equity in the household sector by total assets in the household sector. The aggregate share can also be constructed by calculating each individual household's ratio of equity to total assets, assigning a weight to that ratio that reflects the household's fraction of total household sector assets, and then summing these weighted ratios. This procedure clearly gives wealthier households a much larger weight than households with average asset holdings.

An alternative approach to measuring the composition of household assets is to average individual household portfolio shares without weighting by household wealth. This approach produces what we refer to as the *average* household asset portfolio. The measure can be obtained by using data from the Federal Reserve's Survey of Consumer Finances (SCF), which gathers information on a cross section of about 4,300 households representative of the U.S. population as a whole.

The importance of weighting—or not weighting— the asset data by wealth is brought home very vividly in Chart 1. Using data from the SCF, we plot the median equity and real estate shares by percentile of the wealth distribution for the years 1989 and 1998.[2] What is most evident in the chart is that equity shares vary strikingly with household wealth. Poor households at the bottom of the wealth distribution own little equity or real estate, while households in the middle of the distribution hold most of their wealth in real estate and a small portion in stocks. The wealthiest households have substantial

holdings in both stock and real estate. These dramatic discrepancies in household portfolio allocations suggest that the aggregate equity share, by giving greater weight to wealthy households, would not provide a very representative picture of the stock holdings of the broad spectrum of households. Thus, if we are interested in evaluating the extent to which household investment behavior has contributed to the increased importance of stocks, we need to look at changes in the average, rather than the aggregate, equity share.

Chart 1 provides further support for this conclusion in its depiction of how median equity shares changed over time. Between 1989 and 1998, increases in equity shares were concentrated in the top half of the wealth distribution. This evidence suggests that the 20-percentage-point leap in aggregate equity shares over the period may give a skewed impression of the increased importance of stock holdings for the great majority of households.

Indeed, when we use the SCF data to calculate the change in average household portfolio shares, we find that the average equity share rose from 5.0 percent in 1989 to 11.6 percent in 1998 (Chart 2). This 6.6-percentage-point increase in the average equity share clearly falls short of the more dramatic jump in the aggregate numbers. Nevertheless, it provides a more realistic measure of the rise in the importance of stock holdings
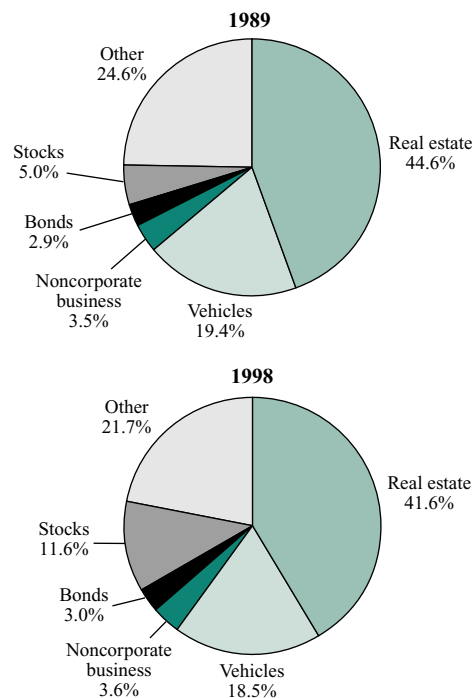
Chart 1
Portion of Household Assets in Corporate Equity and Real Estate, by Wealth Percentile
1989 and 1998
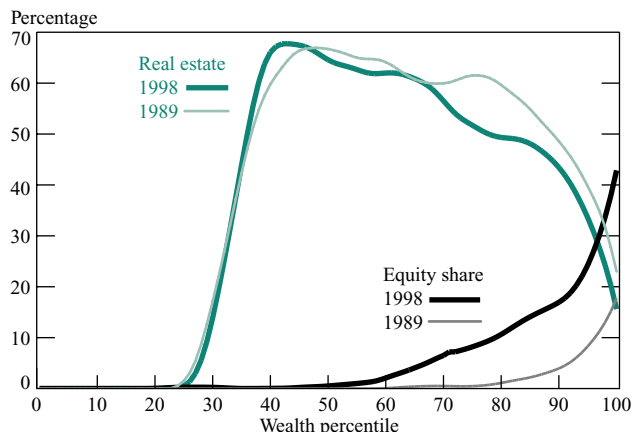
Source: Survey of Consumer Finances.

Chart 2
Average Asset Allocations of U.S. Households

Source: Survey of Consumer Finances.

Note: "Other" assets include transaction accounts, retirement and other managed accounts excluding those invested in stocks and bonds, and all remaining nonfinancial assets.

across all wealth groups. In the analysis that follows, we seek to quantify the contribution of a number of factors to this increase in the average equity share.

Explaining the Shift to Stocks

The average household equity share can be represented as the product of two variables—the percentage of households that own any stocks (the stock ownership rate) and the average equity share among households that own stocks (the "conditional" equity share). Values for both variables can be calculated from SCF data. To arrive at the average equity share for U.S. households in 1989 (5.0 percent), we multiply the stock ownership rate for that year, 34.2 percent, by the conditional equity share of 14.6 percent. Similarly, to arrive at the 11.6 percent average equity share for 1998, we multiply the 1998 stock ownership rate of 50.0 percent by the conditional equity share of 23.2 percent.

Changes over time in the household sector's average equity share, therefore, reflect both changes in the percentage of households owning any stocks and changes in the average fraction of household portfolios devoted to stocks for households already owning stocks. How these two channels combine to produce the change in the average equity share is described by the equation

$$
\begin{aligned}
\text{change in} & \quad \text{change in} & \quad \text{average} \\
\text{average equity} &= \text{stock ownership} \times \text{conditional} \\
\text{share} & \quad \text{rate} & \quad \text{equity share} \\[6pt]
& \quad \text{change in} & \quad \text{average stock} \\
&+ \text{conditional} \times \text{ownership} \\
& \quad \text{equity share} & \quad \text{rate.}
\end{aligned}
$$

Thus we can break down the 6.6-percentage-point increase in the average equity share as follows. Between 1989 and 1998, the stock ownership rate rose 15.8 percentage points; when multiplied by the average conditional equity share over the same period (18.9 percent), the increase accounts for 3.0 percentage points or 45 percent of the total increase. Similarly, the conditional equity share rose 8.6 percentage points between 1989 and 1998; when multiplied by the average stock ownership rate over the period (42.1 percent), this increase accounts for 3.6 percentage points, or 55 percent, of the total increase.

In the remainder of this section, we examine various factors that may have contributed to the rise in the average household equity share in the 1990s. In each case, we look for the factor's influence through the two channels identified here.

Demographic Factors

One likely source of the increased household investment in stocks was the shift in the age distribution of the U.S. population. As the vast baby boom generation moved into their 40s and 50s during the last decade, their need to provide for retirement may have boosted the flow of investment dollars into equity markets.

If the graying of the baby boomers did indeed produce an increase in the average household equity share, we would expect to see evidence of its operation through at least one of our two channels. Specifically, we would expect that the age groups that saw the greatest population growth in the 1990s—the baby boomers—would have high stock ownership rates and/or a high percentage of their assets in the form of stocks.

Evidence of a correlation between age shifts and stock ownership rates is found in Chart 3. The bars in the chart confirm that the greatest population gains during the 1989-98 period were in the groups aged 40 to 49 and 50 to 59—the baby boom generation. The same age groups clearly show the highest stock ownership rates. By contrast, no significant relationship is observable between age and the portion of stockholders' assets in stocks: the conditional equity share is relatively stable across all age groups.

Overall, Chart 3 suggests that, in the period under study, aging influenced the propensity to own stocks, but not the portion of the household portfolio devoted to stocks. In other words, if the aging of the population affected the average household equity share, it did so because it made non-stockholders more likely to purchase stocks, not because it led existing stockholders to increase the share of their portfolios invested in stocks.[3]

To assess more precisely how the aging of the baby boomers has affected the average household equity share, we construct a statistical model.[4] The model allows us to measure the effects in Chart 3 while controlling for other factors that may influence the average equity share—education shifts, the restructuring of retirement plans, and the pattern of asset returns. Our statistical analysis shows that age shifts may have

Chart 3

Stock Ownership Rate and Conditional Equity Share, by Age Group, and Change in the Age Distribution of the Population
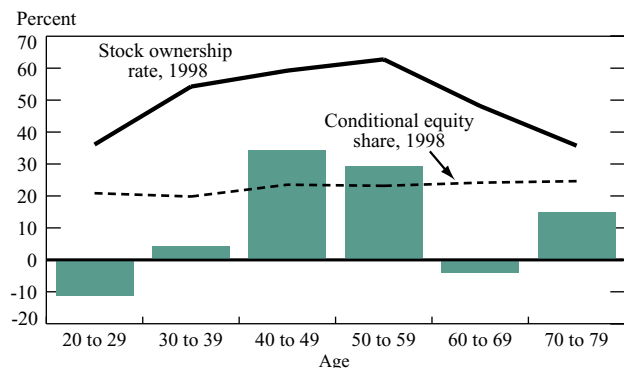
Sources: Survey of Consumer Finances; U.S. Bureau of Labor Statistics, Current Population Survey.

Note: The bars in the chart show the percentage gain or loss in the population of different age groups over the 1989-98 period.

caused the stock ownership rate to increase by 0.6 percentage point between 1989 and 1998. Multiplying this increase by the average conditional equity share over the period indicates that the impact on the average household equity share is 0.1 percentage point.

Not surprisingly, age had a weaker effect on the conditional equity share. The data show that age shifts may have caused the conditional equity share to rise 0.1 percentage point, a negligible increase that, when multiplied by the average stock ownership rate over the period, leaves the average equity share only slightly changed.

Combining the age effects on stock ownership rates and conditional equity shares—our two channels—we find that shifts in the age distribution can account for a scant 0.2 percentage point of the 6.6-percentage-point increase in the average household equity share between 1989 and 1998. Thus, the aging of the baby boomers had a surprisingly small effect on stock investment.

A second demographic factor that may have contributed to the rise in the average equity share is a broad improvement in the education level of the population. Perhaps better educated households have more discretionary income to invest in stocks. If increased educational attainment does explain some part of the larger equity share, we would again expect to find evidence of its operation through at least one of our two channels. In other words, we would expect to find that the education distribution—the breakdown of the population by level, or years, of education—had shifted toward those groups that have high stock ownership rates and/or high conditional equity shares.

Chart 4 suggests a correlation between changes in educational attainment and stock ownership rates. The bars in the chart—which measure the percentage gain or loss in the population of different education groups between 1989 and 1998—show a clear shift in the education distribution toward increased years of schooling. The number of household heads with post-secondary educations grew significantly during the period; within this broad category, the group of household heads with four years of college expanded the most.

The stock ownership rate rose strikingly with the household head's years of education. In 1998, less than 20 percent of those who did not complete high school owned stocks. By contrast, most households headed by a college graduate held stocks in their portfolio, and almost 80 percent of those whose education continued beyond college had invested in stocks.

However, while education level almost certainly influenced whether or not households invested in stocks, it appears that, for households that already owned stocks, no strong relationship existed between years of schooling and the fraction of the household portfolio invested in stocks. The conditional equity

share in 1998 was quite uniform across all education levels. In sum, then, our findings suggest that advances in the population's educational attainments, like the shifts in population age, affected the average household equity share almost entirely through the stock ownership channel—that is, they influenced the likelihood of owning any stocks rather than the portion of the household portfolio allocated to stocks.

Indeed, these findings are borne out by the results of our statistical analysis. Using our model, we find that shifts in the education distribution likely caused the percentage of households that own stocks to increase by 2.6 percentage points. These same education shifts induced the conditional equity share to increase by only 0.3 percentage point. If we incorporate these values in our equation for determining the change in the average equity share, we find that education shifts explain 0.6 percentage point of the total 6.6-percentage-point rise in the average equity share. Although education shifts, somewhat surprisingly, appear to have been more important than age shifts in altering the average household investment behavior, both demographic factors had limited effects. Taken together, they account for only about 11 percent of the observed increase in the average household equity share over the 1990s.

Defined-Contribution Retirement Plans
Another factor that may have helped raise the household equity share is the increased prevalence of defined-contribution (DC) retirement plans. The Internal Revenue Service created these plans—including 401(k) and other tax-deferred savings accounts—in 1982. In many DC plans, workers can choose to invest their contributions in equity funds. In 1989, 23.7 percent of households in the SCF held a DC retirement plan; by late 1998, the percentage had increased to 33.7 percent.

Chart 4
Stock Ownership Rate and Conditional Equity Share, by Education Group, and Change in the Education Distribution of the Population
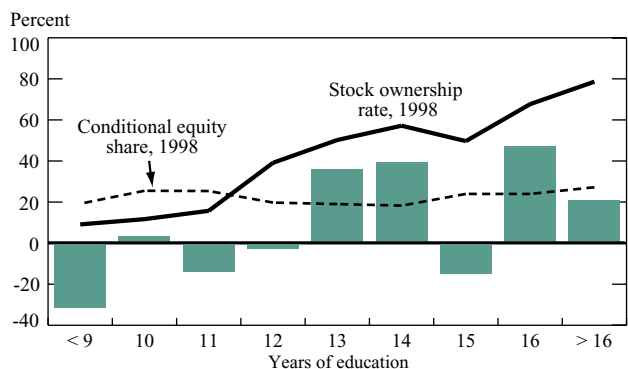
Source: Survey of Consumer Finances.

Note: The bars in the chart show the percentage gain or loss in the population of different education groups over the 1989-98 period.

Defined-contribution plans have made stock investment easy and attractive for households that otherwise may not have held stocks. In 1989, 74 percent of households with a DC plan owned stocks, compared with 22 percent of the rest of the population. However, the conditional equity share for stockholders with DC plans was the same as that for stockholders without them. Our statistical model indicates that the shift toward DC pensions may have increased the stock ownership rate by 5.0 percentage points, while it increased the portfolio share that households allocate to stocks by only 0.6 percentage point. Through the two channels combined, the shift toward DC plans accounts for 1.2 percentage points, or 18 percent, of the 6.6-percentage-point increase in the average household equity share.

Differential Asset Returns
The next factor we consider is the unusually high returns to stock investment in the 1990s. We can gather some idea of the magnitude of these returns by comparing the performance of stocks with that of some alternative investment vehicles—namely, real estate and bonds. During the 1990s, stocks proved to be a much more lucrative investment than either housing or bonds. Over the period, stocks' nominal returns were 320 percent, while returns on bonds were 126 percent and, on real estate, 36 percent.[5]

One might reason that these high returns would induce people to invest in stocks when they otherwise would not, or to increase their exposure to stocks through additional investments. But in order to assess how high returns affected the average household equity share over the last decade, we need to isolate the impact of the returns from that of the investment behavior they may have provoked. To this end, we assume a "passive" investment response to the high returns on equity. In other words, we postulate that households make no important changes in their investment behavior in response to the high returns to equity.

Making this assumption, we find that the high returns on equity can still lead to large shifts in average portfolio shares if the returns to alternative investments differ markedly. To understand this point, consider the hypothetical Van Winkle household, which in 1989 held the nationwide average of stocks, bonds, and real estate. According to the allocations in Chart 2, this means that 5.0 percent of the household's assets were invested in stocks, 2.9 percent in bonds, and 44.6 percent in real estate. Suppose that after allocating his assets in this way, Mr. Van Winkle goes to sleep for nine years. When he wakes up, his portfolio looks very different. Using the average returns to equity, bonds, and real estate during his long nap to update his holdings, we calculate that his 1998 portfolio has an equity share of 12.1 percent, a bond share of 4.6 percent, and a real estate share of 41.6 percent. Notice how similar these values are to the actual average shares in 1998 (Chart 2).

We now measure the impact of the equity return differential in the 1990s on the average household equity share while holding all demographic factors constant at their 1989 levels. This step allows us to isolate the effects of the high returns from those of any demographic changes that occurred during the period (as well as those of the behavioral changes). The approach we take is to repeat the Van Winkle example for each household in the 1989 SCF. Thus, we calculate what each household's portfolio allocations would be in 1998 assuming that the household head did not age, did not become better educated, maintained the same pension plan, and responded passively to all stock market developments during the 1990s. We then average across households to estimate the implied 1998 average household asset allocations.

We find that differential asset returns would have led to an increase of 8.2 percentage points in the equity share held by existing shareholders in 1989.[6] Note that the Van Winkle effect of the high equity returns operates solely through the conditional equity channel. Since we assume passive behavior on the part of investors, there would be no new participants in the stock market and hence no change in the percentage of households owning stock. If we incorporate the increase in the conditional equity share in our formula for determining the change in the average household equity share, we find that the average equity share would have risen 3.5 percentage points. Thus, the high returns to stock investments account for a substantial 53 percent of the observed increase in the average household equity share.[7]

Changes in Investor Behavior
Finally, we consider the contribution of behavioral changes to the rise in the average household equity share. Many commentators have suggested that the increased importance of stocks in the 1990s stemmed from a basic change in the population's investment patterns. In this view, huge numbers of new investors thronged to the markets during the decade, and those who already held stocks eagerly increased their investments.

How influential, then, were behavioral changes? Because direct measurement of the impact of such changes is difficult, we take an indirect approach. We assume that the increase in the average household equity share is the sum of the effects of the factors just disscussed *plus* behavioral effects. We have estimated that demographic changes can explain about 11 percent of the higher equity share; the shift to DC pension plans, roughly 18 percent; and the high relative returns to equity, about 53 percent. Added together, these factors account for roughly 82 percent of the total change in the average household equity share. We then treat the behavioral effects as the residual. Thus, a marked change in household investment patterns could explain at most 18 percent of the rise in the average household equity share—a fairly modest contribution.

Conclusion

The average household equity share increased from 5.0 percent in 1989 to 11.6 percent in 1998. What accounted for this sizable change? Our study examines a number of possible determinants: demographic shifts, the restructuring of pension plans, differential asset returns, and changes in investor behavior. Our findings indicate that demographic changes and the adoption of DC pension plans both contributed in some measure to the increased equity share. But the dominant factor by far was the high relative returns to equity during the 1990s. We estimate that passive behavior in the face of these returns accounted for more than half of the overall rise in the average household equity share. Behavioral changes, while much speculated on, appear to have played only a moderate role.

These findings suggest that the typical household responds to market developments quite sluggishly. Despite intensive media attention to the stock market boom of the 1990s, most households that owned some stocks during the period did not rush to buy more. Similarly, most households that held no stocks refrained from acquiring them. The average household equity share rose in the 1990s not so much because Americans were flocking to Wall Street's party, but because those already attending decided to stay on.

One implication of our results is that the typical household may behave in a similarly languid fashion if market returns over the current decade drop below their historical average. In that event, the average household equity share is likely to fall, but by less than it would if households were racing for the exits. Thus, passive investment behavior promises to smooth out the swings in the average household's asset allocations over time.

Notes

1. "Greenspan Feels the Earth Shake," *New York Times*, April 4, 2000, sec. 4, p. 4.

2. The household equity share includes both direct and indirect ownership of equities. The latter covers mutual funds, defined-contribution retirement accounts, trusts, and managed accounts. It does not include defined-benefit retirement plans. Total wealth includes all assets except human capital and defined-benefit retirement plans such as expected social security income.

3. To measure the effect of aging on household investment behavior, we use the variation across households in stock ownership rates and conditional equity shares for a given survey year. An alternative approach is to look at the investment patterns of different age cohorts of households across survey years. The first method may confuse age effects with cohort effects, while the second method may confuse age effects with time effects. We use the first approach since it seems to us that time effects are likely to be quite important in the 1990s. Using data from the 1983, 1989, and 1992 SCFs, Poterba and Samwick (1997) find that the two methods of construction produce similar age profiles for stock ownership rates and similar equity shares. See Ameriks and Zeldes (2000) for an extensive discussion of the issues relating to age-effect measurement.

4. Details of our statistical model are presented in a technical appendix which is available upon request.

5. Returns on stocks are calculated from the S&P 500 index; on bonds, from the Merrill Lynch Corporate Bond Index of Total Returns; and on real estate, from the United States House Price Index.

6. We repeated this exercise for each three-year period between 1989 and 1998. We found that, on average, households owning stock in 1995 actively shifted out of stocks over the next three years. These households may have been seeking to rebalance their asset allocations in the face of a substantial rise in their equity shares.

7. Ameriks and Zeldes (2000) come to the same basic conclusion using data that track individual investment decisions from 1987 to 1996. Of the households that were continuously followed over this period, 82 percent of stockholders made no active net change to their equity allocations.

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