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# RETURNS ON 401(k) ASSETS BY COHORT

BY ALICIA H. MUNNELL AND JEAN-PIERRE AUBRY\*

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## Introduction

The impact of the financial crisis on the retirement savings of the Early Baby Boomers has received considerable attention. Indeed, from the peak of the market in 2007 to the trough in March 2009, these Early Boomers lost a lot of money – \$1 trillion. But they have already recovered roughly half of these losses with the ensuing rebound in the equities market, and those with balanced portfolios may have recovered fully. More important, over their full working careers, the Early Boomers have actually been treated quite well by the financial markets, measured against two benchmarks: lifetime returns on retirement assets and the experience of the Late Boomers and Generation Xers. The cohort at the greatest risk appears to be the Late Boomers, who have experienced a less favorable investment environment over their careers and will need extraordinary returns just to end up as well off as the Early Boomers are today. Generation Xers, given their shorter careers, have faced the worst environment, but they have more time to catch up.

This *brief* puts the investment experience of the Early Boomers in context by comparing it with historical returns and with the experience of younger workers. The first section describes the asset holdings in retirement accounts of different cohorts at the peak of the market, and the impact of the financial collapse on those holdings. To understand how the market collapse affected workers at different stages in their worklives, the second section presents the monthly 401(k) balances for three hypothetical employees who were age 30 (Generation Xer), 40 (Late Boomer), and 50 (Early Boomer) in 1999. This comparison confirms the often-reported collapse in 401(k) balances for older workers, but it also shows that younger workers have had a far worse asset-accumulation experience because they missed the full run-up in equities prices between 1982 and 2000. The third section calculates how much younger workers would have to earn on their portfolios in the future to end up with as much retirement wealth relative to final earnings as the Early Boomers hold today. The final section concludes.

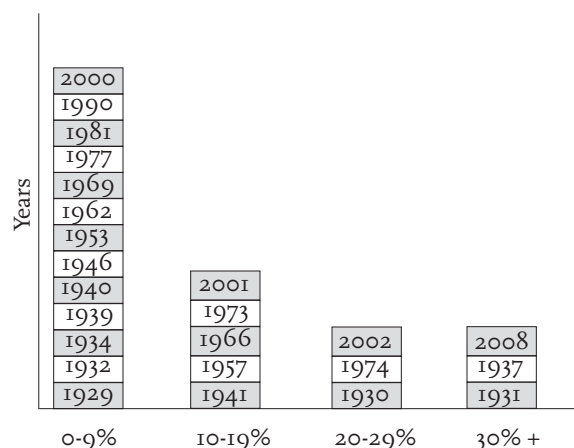
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## Asset Losses by Cohort

Investing in equities is a central tenet of any effective retirement saving strategy, because the higher expected long-term return offers the potential for lower required contributions. But the upside of equities comes with substantial risk of periods of negative returns. The size of such declines typically varies from a “garden variety” correction of around 10 percent to a more serious bear market with drops of around 20 percent (see Figure 1). However, occasionally the market experiences a much larger shock, such as we have just seen. Between the peak of the stock market on October 9, 2007, and March 9, 2009, equity prices fell 57 percent. Individuals saw the value of equities in their 401(k) plans or IRAs, whose balances consist largely of rollovers from employer-sponsored plans, drop by \$2.8 trillion. Using the peak of the market to gauge the magnitude of the decline does not mean that 2007 equity prices could be justified by earnings, but it helps explain why people were so stunned by the drop.

FIGURE 1. YEARS OF NEGATIVE ANNUAL TOTAL RETURNS ON EQUITIES, BY SIZE OF DECLINE, 1929-2009



Source: Ibbotson Associates (2009).

Most of the losses in equity values occurred in retirement accounts held by Early Boomers approaching retirement (see Table 1).<sup>1</sup> Those already retired were more reliant on traditional defined benefit plans for retirement income and therefore held relatively modest 401(k) balances and, to the extent they had IRAs, they held less of their balances in stock. Late

Boomers had smaller balances than their older counterparts, and Gen Xers had not yet accumulated substantial 401(k) assets. Therefore, not surprisingly, the decline in equity values experienced by older workers received an enormous amount of attention.

TABLE 1. EQUITY LOSSES BY AGE OF HOUSEHOLD HEAD, OCT. 9, 2007-MAR. 9, 2009, IN TRILLIONS

Age	401(k)	IRAs	Total
Under 35	\$0.1	\$0.0	\$0.1
35-44	0.3	0.1	0.4
45-54	0.6	0.2	0.8
55-64	0.6	0.4	1.0
65 +	0.1	0.4	0.5
Total	1.6	1.2	2.8

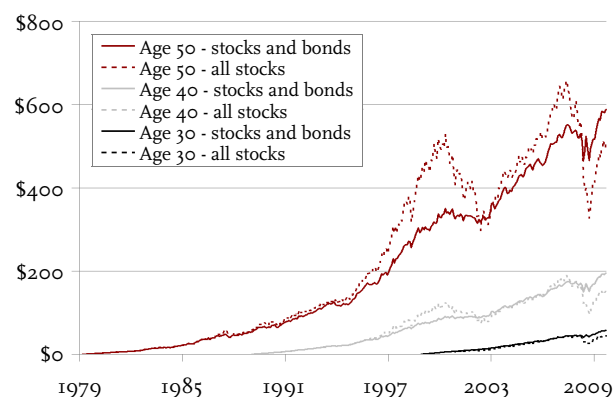
Note: Figures may not add to totals due to rounding.  
Source: Authors' estimates. See Footnote 1 for details.

## A Lifetime Perspective

The picture of 401(k) experiences by cohort looks very different when examined over each participant's respective working life. Figure 2 on the next page presents the monthly 401(k) balances for three hypothetical employees who were age 30 (Gen Xer), 40 (Late Boomer), and 50 (Early Boomer) in 1999. All three employees began contributing 6 percent to their 401(k) at age 30, and their employers made a matching contribution of 3 percent. The employees' starting salary was based on median earnings for those 30, 40, and 50 with 401(k)s, as reported in the Federal Reserve's 1998 *Survey of Consumer Finances*. Nominal salary growth was estimated at 3 percent, which is in line with the Bureau of Labor Statistics' estimates for average annual wage and compensation growth. The exercise was conducted assuming an all-equities portfolio and a mixed portfolio of half equities and half bonds.<sup>2</sup> The results reflect the often-reported collapse in 401(k) balances for older workers, as balances drop sharply between October 2007 and March 2009. But this drop does not tell the whole story.

The more telling metric is the internal rate of return on lifetime contributions for each cohort, at the market peak in October 2007 and the market trough in March 2009. On this scale, the Early Boomers actually fared quite well over their lifetimes. As Figure 3 shows, up until the peak of the market in

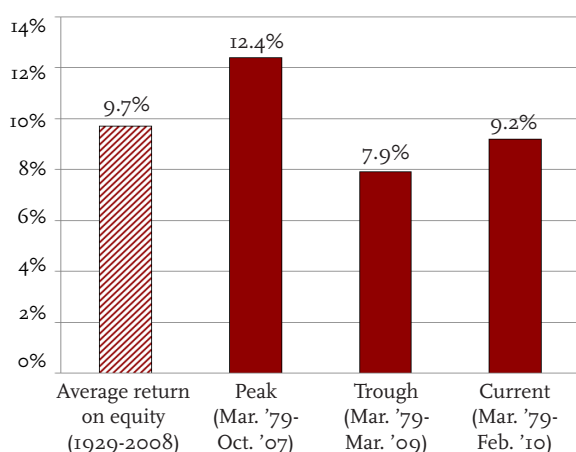
FIGURE 2. MONTHLY 401(k) BALANCES FOR THREE HYPOTHETICAL WORKERS, IN THOUSANDS<sup>3</sup>



Sources: Authors' calculations based on S&P's Index Services (2009); Barclays Capital (2009); Ibbotson Associates (2009); and the U.S. Board of Governors of the Federal Reserve System, *Survey of Consumer Finances* (SCF), 1998.

October 2007, the oldest cohort enjoyed more than a 12-percent annual return on its contributions. Surprisingly, even at the nadir of the market crash, the oldest cohort still enjoyed an almost 8-percent annual lifetime return on its contributions in an all-equities portfolio (8.5 percent if invested in half equities and half bonds).<sup>4</sup> And with the recent partial recovery of

FIGURE 3. RETURN ON EARLY BOOMERS' 401(k) CONTRIBUTIONS INVESTED IN EQUITIES, 1979 TO PEAK, TROUGH, AND CURRENT



Sources: Authors' calculations based on S&P's Index Services (2009); Barclays Capital (2009); Ibbotson Associates (2009); and the 1998 SCF.

the market, this return is now over 9 percent. These returns compare well with the benchmark returns for equities and bonds over the period 1929-2008.

The success of the Early Boomers contrasts sharply with the experience of subsequent cohorts (see Table 2). Unlike their older counterparts, younger participants never enjoyed the full run-up in the stock market from 1982-2000 and have endured two market collapses.

TABLE 2. INTERNAL RATE OF RETURN ON TOTAL 401(k) CONTRIBUTIONS FOR THREE HYPOTHETICAL WORKERS

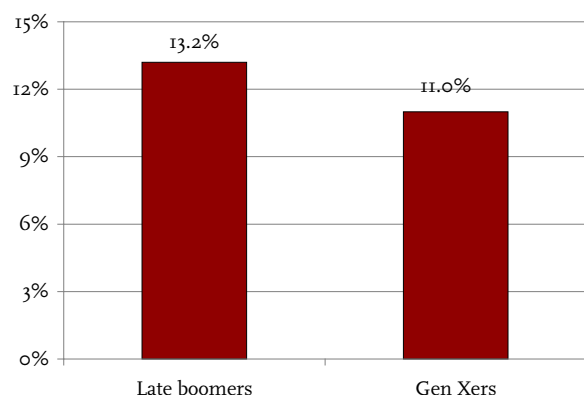
Investment mix/ date	Gen Xer (30 in 1999)	Late Boomer (40 in 1999)	Early Boomer (50 in 1999)
All equities			
Peak (Oct. '07)	8.0%	10.3%	12.4%
Trough (Mar. '09)	-6.4	3.1	7.9
Current (Feb. '10)	0.3	5.5	9.2
Half equities/half bonds			
Peak (Oct. '07)	7.8%	9.4%	11.2%
Trough (Mar. '09)	-0.6	5.5	8.7
Current (Feb. '10)	2.4	6.6	9.3

Sources: Authors' calculations based on S&P's Index Services (2009); Barclays Capital (2009); Ibbotson Associates (2009); and the 1998 SCF.

## Can Younger Cohorts Catch Up?

The question is how much younger cohorts would have to earn going forward to end up with the same ratio of assets to income at age 60 currently enjoyed by the Early Boomers. Our calculations suggest that stocks would have to average a nominal compound return of 13.2 percent for the Late Boomers and 11.0 percent for the Gen Xers, who have more time until retirement (see Figure 4 on the next page). The returns required for both the Late Boomers and Gen Xers may not be impossible, but they are certainly on the high side of average.

FIGURE 4. EQUITY RETURNS REQUIRED FOR LATE BOOMERS AND GEN XERS TO MATCH EARLY BOOMERS, AS OF FEB. 2010



Sources: Authors' calculations based on S&P's Index Services (2009); Barclays Capital (2009); Ibbotson Associates (2009); and the 1998 SCF.

As jarring as the financial collapse may have been for the Early Boomers, the market has actually treated them well over their lifetime. Hypothetical workers investing either all in equities or in half equities and half bonds have enjoyed fairly high returns compared with long-run averages. This agreeable outcome is the result of these workers having substantial assets during the long bull market that began in 1982 and ended in 2000.

Moreover, the market has treated Early Boomers a lot better than the subsequent cohorts. Late Boomers and Gen Xers never benefited fully from the 1982-2000 bull market and were hard hit by two market collapses. The Late Boomers are the most vulnerable, as they would need substantial returns in the future to end up with the same ratio of assets to income at age 60 currently enjoyed by Early Boomers. One way to help the Late Boomers would be for policymakers and plan sponsors to make sure that 401(k) auto-enrollment and savings escalation policies cover existing workers as well as new hires.

## Conclusion

Older workers received the most press attention in the wake of the market collapse. Indeed, these workers lost a lot of money and – if they largely invested in equities – their nest eggs have only partially recovered since the market trough. Even though equity values were likely inflated at the peak, many older workers were counting on these inflated balances for retirement income. Being close to retirement, they have little time to make up their remaining losses. The challenge has been accentuated by the ensuing recession, which has made working longer difficult and left saving more as the only real option.

## Endnotes

1 The equity losses in Table 1 were calculated as follows: The total value of all 401(k) and IRA assets that were invested in equities as of October 2007 was derived from the Federal Reserve's *Flow of Funds* as the sum of all 401(k) and IRA assets held in corporate equities plus 80 percent of the assets held in mutual funds. We then applied the change in the Dow Jones Wilshire 5000 Total Return Index from October 9, 2007, to March 9, 2009, to estimate the decline in 401(k) and IRA assets invested in equities. The total equities losses are distributed to each age group based on its percentage of total 401(k) and IRA assets in the 2007 *Survey of Consumer Finances*.

2 For the hypothetical worker invested in stocks and bonds, the simulation assumes that the worker invests his monthly contributions in 50 percent stocks and 50 percent bonds, and annually reallocates his total plan assets so that 50 percent are held in stocks and 50 percent are held in bonds.

3 These simulations assume that those age 50 in 2009 began their account in 1979. Since 401(k)s did not exist in their current form at that time, the assumption is that annual contributions of 9 percent of salary were made to a profit-sharing plan that was converted to a 401(k) plan after 1981.

4 The investment in stocks was invested in the S&P 500 Index with reinvested dividends. The investment in bonds was in long-term government bonds with reinvested interest, and in a long-term investment-grade bond index.

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The Center for Retirement Research at Boston College was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

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