The Evolution of
Retirement Wealth

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Abstract

Is the current mix of tax preferences for employer-sponsored pensions and individual retirement saving in the U.S. delivering the best possible retirement-preparedness across and within generations? Using data from the triennial Survey of Consumer Finances for 1989 through 2013, cohort-based analysis of life-cycle trajectories shows that (1) overall retirement plan participation was relatively stable or even rising through 2007, though participation fell noticeably in the wake of the Great Recession and has remained lower, (2) participation is strongly correlated with income, and the shift in the *type* of pension coverage occurred within—not just across—income groups, (3) relative to previous cohorts and a counterfactual lifecycle benchmark, the recent decline in retirement plan participation and DC retirement account balance-to-income ratios is concentrated among younger families and lower-income families.

JEL Codes: D14, H55, J32

1. Introduction

Employer-sponsored retirement plans and Social Security have both evolved substantially in the U.S. over the past several decades, and it is important to revisit the question of whether the current combination of tax preferences for retirement saving and Social Security tax and benefit rules are delivering on the overarching goal of adequate retirement preparedness. A key first step in such an investigation is to measure retirement wealth—including the claims to future retirement income streams—using a framework that shows how retirement resources are evolving across and within generations as they progress through the lifecycle.[1] The triennial Survey of Consumer Finances (SCF) is well-suited for this measurement exercise, because the survey covers a long time period, includes households headed by all age groups, and combines careful measurement of work-related pensions, personal retirement accounts, and earnings histories with other relevant demographic, income, and balance sheet information.[2]

Aggregate data on retirement wealth provides (at best) a mixed view about trends in retirement preparedness (Figure 1). The ratio of aggregate (non-Social Security) retirement claims to aggregate personal income has nearly doubled since 1989, but most of that growth occurred between 1989 and 1999. Since 2000, financial market volatility has led directly to large swings in the overall retirement wealth to income ratio, and there is no net upward movement even as the population continues to rapidly age and income growth (affecting the

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[1] There is substantial disagreement in the U.S. about the state of retirement preparedness across and within generations, and Poterba (2014) provides an excellent overview of the literature. Most notably, Scholz et al. (2006) argue that most households have retirement resources that are largely consistent with the predictions of a lifecycle planning model, while Munnell et al. (2012) and Wolff (2014) argue that retirement preparedness is deteriorating for many. Bernheim et al. (2001) argue that standard lifecycle determinants of retirement preparedness do not explain substantial differences between households nearing retirement.

[2] The synthetic-cohort approach applied to the SCF in this paper is methodologically similar to recent work by Collins et al. (2013), looking at typical U.S. balance sheets across birth cohorts. SCF cross-sections have also been used to analyze lifecycle saving by Sabelhaus and Pence (1999) and Gale and Pence (2006).

denominator) is slowing. The share of retirement assets accounted for by defined benefit (DB)

plans has fallen, as defined contribution (DC) coverage expanded, especially among working-age

households. Even if the overall trend was clear, however, the aggregate wealth to income ratio

does not tell us anything about the distribution of retirement wealth across and within cohorts,

which is the key to thinking about retirement policy more generally.

The starting point for analyzing the evolution of retirement wealth across and within

generations is measuring participation in employment-related pension plans and individual

retirement accounts (IRAs). SCF data for 1989 through 2013 shows that retirement plan

participation was stable or even increasing through 2007, especially when viewed from a

lifecycle perspective. Younger generations were achieving systematically higher rates of

participation than their predecessors, at any given age. There was a (well-documented) shift in

the *type* of retirement plan from DB to DC, especially in the private sector, but there was no

substantial net decrease in overall participation during this period. That upward trend ended with

the onset of the Great Recession, and the 2010 SCF showed a decrease in retirement plan

participation that has, as of the 2013 survey, yet to be reversed. The declines after 2007 in

participation trajectories, relative to previous cohorts, are widespread, but most pronounced for

the youngest families.

The SCF also makes it possible to break down these cohort-level trends and look within

birth cohorts to investigate how retirement plan participation is evolving across income groups.

It is not surprising, given labor market fundamentals and the structure of Social Security, that

participation in employment-related retirement plans is always and everywhere positively

correlated with income. The lifecycle peak for participation in (any form of past, current, or

future) retirement plans is now just over 60 percent for the cohort approaching retirement in the

bottom half of the income distribution, but over 90 percent for families in the 50th through 95th percentiles, and near 100 percent for families in the top 5 percent of the income distribution.

The conditional distributions of DB versus DC coverage *within* income groups provide an important corollary to the observation about overall retirement plan coverage *across* income groups, and the shift from DB to DC. Even though overall retirement plan participation is greater for the highest income groups in every year, the mix of coverage by type in any given year does not vary substantially by income. Higher income families are more likely to have a combination of DB and DC coverage, but the overall rate for DB inclusion (conditional on any coverage) is roughly the same. Thus, the data confirms that all income groups saw the same dramatic compositional shift from DB to DC during the past several decades.

The lifecycle perspective applied to the SCF by income group shows that the historical differences in retirement plan coverage by income have widened in recent years, and especially since the Great Recession. The relative declines in participation and in the ratio of retirement wealth to income after 2007 are widespread, but most pronounced for younger cohorts, and within any given cohort, most pronounced for lower-income families. This divergence in retirement wealth accumulation trajectories across income groups is consistent with a dramatic slowdown in lifecycle income growth, and indicates that systematic retirement saving was sacrificed by many families experiencing diminished economic resources, in the wake of the Great Recession.

2. Measuring Retirement Plan Participation and Retirement Wealth Using the SCF

The data used here to study retirement plan participation and wealth accumulation is the series of cross-sections from the triennial Survey of Consumer Finances (SCF) conducted between 1989 and 2013. The SCF is well-suited for analyzing retirement savings from a life-cycle perspective, because the survey covers a long time period, includes households headed by all age groups, and combines careful measurement of work-related pensions, personal retirement accounts, and earnings histories with other relevant demographic, income, and balance sheet information. [3] Tracking of retirement resources in the SCF is intended to be comprehensive, including all forms of past, current, and future claims in both defined benefit (DB) and defined contribution (DC) pensions, as well as individual retirement accounts (IRAs).[4]

The concept of retirement plan "participation" used here is based on the observation of any evidence of claim to tax-advantaged retirement resources through a current account balance or current income stream, or as an expected income stream to commence in some future year. The financial asset section of the SCF questionnaire captures IRAs, the employment section of the survey captures information about DB and DC pensions associated with current employment, and the future pensions section captures claims to future DB pension benefits or DC accounts associated with past jobs and not rolled over (as most are) to an IRA. The survey has a number of built-in checks across the sections to make sure the measurement of claims to retirement resources are complete, and without double-counting. Benchmarking to available evidence

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[3] For an overview of the SCF and latest results see Bricker, et al. (2014).

[4] The focus of this paper is on overall retirement plan participation and the accumulation of DC plan balances, but other questions in the SCF about expected DB benefits and lifecycle earnings histories can be used to estimate the other components of the retirement balance sheet, including Social Security. Examples of papers that develop more comprehensive estimates using the SCF include Poterba (2014) and Wolff (2014). Estimating and valuing DB and Social Security income streams across and within generations is the next step in this project.

suggests the SCF does a very good job identifying participation in tax-advantaged retirement accounts.[5]

Based on this comprehensive measure, overall retirement plan participation has not evolved much in the past quarter century, even though the retirement landscape has gone through substantial changes. The fraction of all families with any evidence of retirement plan participation has hovered between 60 and 70 percent (Figure 2A) while the fraction of working-age families (ages 25 to 59) with evidence of coverage has hovered between 70 and 80 percent (Figure 2B). Overall coverage trends for all and working-age families indicate recent declines in retirement plan participation.

The more noteworthy change in retirement plan participation is in the type of pension coverage. The shift in employer-sponsored plans from DB to DC was well under way before the 1989 SCF was conducted, and very few families (and even fewer working-age families) had *only* DB coverage in that base year. It is important to remember that a family with a DB plan in their current job and *any* form of DC balance, including the (generally small) IRAs opened during the IRA heyday of the early 1980s, or a rolled-over distribution from a previous job DB plan, will show up as having both DB and DC coverage in these tabulations.

More noteworthy than the levels and trend in only DB is the shift towards *only* DC. The top part of the stacked bars shows that the fraction of all families with only DC coverage has nearly doubled since 1989. The trend for all families includes retirees who are receiving DB pension benefits from a prior job. Thus, the trend for working-age families is a clearer indicator of the trajectory for retirement resources going forward. About 50 percent of working-age

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[5] See Argento, et al. (2014) for a comparison of SCF retirement plan participation with information from tax returns. Evidence of participation using tax returns is based on the same principles, because form W2 indicates current job coverage, and forms 5498 and 1099-R indicate account balances or flows for accounts not linked to the current job.

families had some form of DB coverage (current or past job) in 1989, and that fell to about 30 percent by 2013.

The increasing importance of DC plans for younger cohorts motivates the initial focus here on lifecycle trajectories for DC account balances, and those balances are directly observed in the SCF. Sample representativeness and respondent reporting bias are sources of concern when using household surveys to measure outcomes, and it is useful to benchmark the survey values before looking at trends in retirement wealth from a distributional perspective. Retirement resources (other than Social Security) are concentrated at the top of the income and wealth distribution. The SCF sampling strategy is unique among U.S. household surveys in terms of capturing wealthy families, and thus provides a more comprehensive view of the retirement wealth distribution.[6]

Direct comparison of SCF with published aggregates confirms that the survey has indeed done a good job capturing the entirety of DC balances over the sample period (Figure 3). There is some evidence that respondent-reported values for retirement account balances diverge from the estimates based on financial institution and government sources following dramatic swings in asset values, such as in 2001 and 2010. Those deviations seem temporary, however, and perhaps due to respondent lags in updating account balances. Even those deviations are never more than a few percentage points, and overall aggregate DC holdings are well-captured by the SCF for 1989-2013.

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[6] The appendix to Bricker et al. (2014) provides an overview of the SCF sampling strategy, including over-sampling and the weighting adjustments to correct for differential non-response of wealthy families.

3. Retirement Plan Participation across and within Birth Cohorts

Overall trends in tax-preferred retirement plan participation are a good starting point for analyzing policy towards retirement tax-preferences, and the SCF makes it possible to go further and look across and within birth cohorts to investigate how the evolving retirement landscape is affecting different groups in the population. The usual approach in this sort of distributional analysis is to measure retirement plan participation and account balances across age groups and time, but a lifecycle framework provides a more dynamic view of changes across and within generations. This lifecycle view shows dramatic swings in retirement plan participation across cohorts during the 1989-2013 period and dramatic differences in participation within cohorts (by income) in every time period.

The SCF lacks a panel component that would make it possible to directly observe changes in retirement plan participation and account balances for a sample of families, but the synthetic-cohort approach used here is well-suited for studying typical outcomes across different *types* of families at various points in the lifecycle.[7] Synthetic-cohort analysis makes it possible to study outcomes across the population using different cross-sections at different points in time, such as in the SCF. The identifying assumption is that a given cohort is well-represented in each of the cross-sections, and the summary statistics observed from one cross-section to another provide useful information about the changes for that group over time. The SCF is well-suited for the analysis here across broad birth cohorts and income groups, as the sample sizes for

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[7] The Health and Retirement Study (HRS) is an excellent resource for studying retirement wealth trajectories for U.S. families approaching or in retirement, and the HRS has a panel structure. See, in particular, Gustman et al. (2010, 2011, 2014) and Poterba et al. (2007, 2012, 2013). Unfortunately, the HRS does not include the younger families and the very wealthy families who are included in the SCF, and those missing groups are the focus of much of the analysis in this paper.

generating the summary retirement plan participation and account balance measures are sufficiently large to infer changes over time.[8]

The SCF cross-sections used here span the period 1989 to 2013, and thus any given birth cohort can be tracked for (at most) that twenty-four year period. Looking across ten-year birth cohorts born between 1920 and 1990, and using all of the SCF surveys, one sees a very predictable lifecycle pattern in retirement plan participation by age (Figure 4). The overall pattern is hump-shaped, as retirement plan participation (generally) rises steeply for families as they move from their twenties to their fifties, before stabilizing, and declining (though perhaps only slightly) for families that have crossed into retirement.[9]

The lifecycle trajectories *within* birth cohorts tell the more interesting story about evolving retirement coverage, however. The height difference (by age) for any two overlapping cohort lines indicates the difference in participation (at that age) between the two cohorts. Figure 4 thus shows two clearly different stories about trends in retirement plan participation over the 1989-2013 period. In the early part of the period, younger cohorts were achieving generally higher rates of plan participation at younger ages. After 2007, however, that trend reversed, and the drop in participation has been such that younger cohorts are failing to achieve the levels reached by predecessor cohorts at the same ages.

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[8] This is not meant to imply that the synthetic cohort approach used here is necessarily inferior to panel data for this type of long-run distributional analysis across groups and time. True panels suffer from non-random attrition bias on top of any selection bias associated with participation in a cross-section survey, and reporting/measurement variability in panel surveys is such that analyzing the distribution of individual *changes* in retirement wealth can be highly problematic. Indeed, most analysis of data sets such as the HRS involve comparing summary statistics for a given cohort at different points in time, just like those produced here. The more salient difference is in how families are grouped—for example, by current versus permanent income—when estimating those summary statistics at each point in time.

[9] The tendency of retirees to not draw down tax-preferred accounts has been analyzed extensively by Love et al. (2009) and Poterba et al. (2013). Whether or not these trajectories are consistent with optimizing behavior depends importantly on one's underlying model, and even the concept of "consumption" versus "spending" one has in mind. See, for example, Aguiar and Hurst (2005) and Hurd and Rohwedder (2013).

The 1961-1970 birth cohort provides the clearest example of this sharp break in trend. When that cohort was first observed in their early twenties (on average) in the 1989 survey, just under 40 percent were participating in retirement plans. A decade later the 1961-1970 cohort was observed in their early thirties, and some 70 percent of families had coverage, nearly 10 percentage points above the participation rate for the previous cohort (born between 1951 and 1960) when they were in their early thirties (as observed around 1990). However, not only did the 1961-70 cohort seem to peak in terms of coverage in their early thirties, their participation has now fallen, and such that the last time they were observed (approaching age 50, in 2013) their participation rate was nearly 10 percentage points *below* the 1951-1960 birth cohort (as observed in the early 2000s) and even the 1941-1950 birth cohort (as observed in the early 1990s). Although the 1961-1970 cohort is the most extreme example, every cohort shows the pattern of first exceeding, and then falling below, earlier cohorts at the same age, in terms of overall retirement plan participation.

This dramatic takeaway from the lifecycle perspective on cohort-level retirement plan participation provides a sharp contrast with the much more nuanced view from the aggregate charts (Figures 2A and 2B). The key to reconciling the two is demographic trends. As the Baby Boom approached middle age, if lifecycle trajectories had not changed, the overall retirement plan participation would have risen substantially because the Baby Boom has a greater population weight and is at their lifecycle peak in retirement plan participation. The only reason aggregate participation stabilized and then fell slightly was that within-cohort changes dominated the demographic effect.

Acknowledging that participation in retirement plans is down substantially from a lifecycle perspective, especially for younger cohorts, is an important starting point for thinking

about the evolution of retirement outcomes, but the more pressing question is who, within those birth cohorts, is experiencing those changes? The obvious dimension on which to cut the cohort data is income, as there are well-known differences in retirement plan offerings and participation across income groups. The SCF makes it possible to look within birth cohorts across income groups using the same lifecycle perspective, to study both levels and changes in participation over time.

One potential problem in synthetic cohort analysis is the possibility that families in a given group in a given year are not the same families (probabilistically) as the families in the same group in a different year. This is obviously not a problem with something mechanical like birth cohort, but sorting families on income is problematic, especially if there large transitory shocks to incomes in a given year. When that happens, for example, the (usually) higher-families who experience large negative shocks will be grouped with the (usually) lower-income families, and their accumulated retirement wealth will be averaged in with those (usually) lower-income families.

Fortunately, the SCF has a set of income questions that make it possible to eliminate most of this sorting bias in the synthetic-cohort analysis. The income measure used in this paper is derived from the survey questions about the gap between actual and "usual" income in the SCF. Towards the end of the SCF interview, after detailed income components have been summed to arrive at a total, respondents are asked if that total income is higher than, lower than, or about the same as their income in a "usual" year. Most respondents say their reported total income is in fact about normal—the median gap between actual and usual income is zero in every survey year. However, sizable minorities of respondents indicate that their income is either unusually high or unusually low, and those fractions vary predictably and systematically with business

cycle conditions. Those sizable minorities who say they experienced a shock are then asked

what their income would be in a "usual" year, and that (along with actual income for the majority

who say their income is equal to the usual value) is the classifier used here.[10]

Differences in lifecycle patterns for retirement plan participation across usual income

groups are not surprising, especially given what we know about compensation patterns, labor

market dynamics, and Social Security replacement rates (Figure 5).[11] Retirement plan

participation is always and everywhere strongly and positively associated with usual income, and

there are very different lifecycle trajectories and peaks across the three usual income groups

represented here: the bottom 50 percent of families, the "next" 45 percent of families (percentiles

50 through 95), and the top 5 percent of families.[12] Indeed, it really does not even make sense to

think of retirement plan participation among the top 5 percent as a "trajectory" per se, because

participation is nearly universal for that income group at every point in the lifecycle.

The possible (and perhaps competing) explanations for these differences in retirement

plan participation rates by income are well known. Families in the bottom 50 perfect of the usual

income distribution experience not just lower overall compensation, of which retirement plan

offerings are a component, but also much more employment volatility and job change, which

also affect retirement plan offerings and participation. On the positive side, those lower-income

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[10] Box 2 in Bricker et al. (2014) show how the usual income classifier affects conclusions about changes in family finances over time. Indeed, the regular *Federal Reserve Bulletin* publication on SCF findings now uses *only* usual income to sort families for the standard tables, because recent widespread income shocks have underscored the problems with grouping families by actual income when comparing outcomes over time.

[11] Although the SCF has maintained a consistent methodological design since the 1989 survey, the question on "usual" income was not added until the 1995 survey, and thus the within-cohort results presented here are limited to the period 1995-2013. Relative to Figure 4, which plotted participation across birth cohorts for 1989-2013, the sorting by usual income eliminates the first two points (representing six years) for the cohorts who could have been observed prior to the 1995 survey.

[12] Families are sorted by usual income within their respective birth cohorts. The specific usual income groups are motivated in part by analysis of income inequality that suggests a clear trend separation near the top few percentiles of families by income, with the top five percent chosen specifically to provide sufficient sample size for the synthetic cohort tabulations. The oversampling of the SCF at the very top plays an important role here, because that top 5 percent is represented by a disproportionate number of families.

families also receive a much higher replacement rate from Social Security, such that their *need* to save is greatly diminished relative to higher-income families, for whom Social Security is much less adequate in terms of replacing earned income.[13]

Although explaining the levels of participation by income and age is beyond the scope of the current paper, the lifecycle trajectories do make it possible to address the distributional question about changes in participation raised above. The largest decreases in retirement plan participation, relative to the lifecycle trajectories of previous cohorts in the same income groups, have occurred for all pre-retirement families in the bottom half by usual income, and to some extent for the younger cohorts in the next 45 percent. The only groups who have not seen large changes in retirement plan coverage are older families across all income groups, and all age groups at the top of the usual income distribution. Again, the 1961-1970 cohort provides a useful benchmark: families in the bottom half by usual income within that cohort have reached only a 50 percent participation rate as they approach age 50, in 2013, which is well below the lifecycle peak achieved by lower-income families in the three previous cohorts.

There is an important corollary that ties together the shift in *type* of pension coverage (Figures 2A and 2B) with changes in the *distribution* of retirement plan participation by usual income and cohort (Figure 5). [14] Overall participation is positively correlated with income, but the type of coverage, conditional on any participation, is roughly proportional across income groups at every point in time (Table 1).

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[13] This assertion is based on the highly progressive formula for determining Social Security benefits (specifically, Primary Insurance Amount, or PIA) relative to lifetime earnings (specifically, Average Indexed Monthly Earnings, or AIME). Mitchell and Phillips (2006) discuss conceptual issues involved with measuring Social Security replacement rates.

[14] Butrica et al. (2009) and Wolff (2014) also explore the distributional implications of the decline in DB coverage for future retirement outcomes.

Among working age families (headed by individuals 25 to 59 years old) the overall retirement plan participation rates in 1995 were 54 percent for the bottom half by usual income, and 96 percent for the top 5 percent of families by usual income. By 2013 the overall participation rates had fallen to 44 percent for the bottom half, and 94 percent for the top 5. However, conditional on having coverage, the types of coverage were about the same across income groups. In 1995, 53 percent of those with coverage in the bottom half by usual income had a DB or mixed DB+DC, while 48 percent of those in the top 5 had such coverage. By 2013, the conditional DB+DC coverage rates had fallen to 38 percent at the bottom, and 25 percent at the top.

In an important sense, the shift away from DB was most prominent at the top, because they experienced the largest overall and conditional declines in DB coverage during this period. However, another way to look at the same phenomenon is that the replacement of DC for DB coverage was much more effective at the top. When DB plans disappeared, higher-income families had more opportunities and/or more likely to voluntarily participate in the emerging DC system.

4. DC Retirement Account Wealth to Income Ratios

The lifecycle perspective on participation in tax-preferred retirement saving plans shows a somewhat dramatic recent decline for many younger and lower-income families, but participation is only the first margin of behavior. It is possible, for example, that the decrease in participation was concentrated among those for whom actual accumulations are relatively small, at least relative to their incomes or other resources. The overall assessment of evolving retirement wealth requires comprehensive measures of accumulated balances and claims to

future income streams, including DB plans and Social Security.[15] In this section we take a first

step towards that ultimate goal and focus on the most rapidly growing form of retirement wealth,

DC balances, which are directly observed in the SCF.

There are a few different ways to (statistically) look across and within cohort groups to

evaluate the importance of accumulated retirement wealth at any point in time (Table 2). The

unconditional mean of retirement balances captures both the participation and accumulation

dimensions in one statistic, the conditional median gives an indication of importance of

accumulated balances for the typical family in the group with any balances, and the conditional

mean further shows how skewed balances are (relative to the conditional median) among

families in the group who have balances. Although the three measures diverge somewhat in

terms of levels, the patterns across and within birth cohorts are generally similar.

The 1961-1970 birth cohort serves as a good example, once again. As of 2013, this

group was on average 48 years old, and their retirement plan participation was around 70 percent

(Figure 4) but there are big differences in participation across the three usual income groups

(Figure 5). The unconditional mean DC retirement balances for this group in 2013 were $15,330

for the bottom half by usual income, $130,372 for the next 45 percent, and $552,170 for the top 5

percent. The within-cohort values for conditional medians and means are also highly skewed,

though slightly less so, because of the big differences in retirement plan participation by income

noted above. Although all three statistics are useful in their own right for answering specific

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questions, the focus here will be on unconditional means, which capture both participation and accumulation behavior.

The across and within-cohort differences in unconditional mean DC balances at a point in time do not provide direct evidence about adequacy, though normalizing by income is an important step in that direction. The static measures also do not indicate anything about changes over time, which (as with participation) is best conveyed using the lifecycle framework that shows within and across cohort movements. Thus, the analysis below focusses on the ratio of (unconditional) average DC retirement assets to average usual income across and within cohorts, 1995 through 2013 (Figure 6).

The differences in wealth to income ratios by usual income (Figure 6) are much less stark than the differences in DC balances (Table 2) or retirement account participation (Figure 5). Average DC balances for cohorts around age 60 in 2007 (that is, the 1941-1950 cohort) were roughly 100 percent of average usual income for the bottom half of the usual income distribution, and about 150 percent of average usual income for the next 45 percent and top 5 percent.[16] Thus, dramatic differences in average usual income—especially for the top 5 percent relative to the other two income groups—largely offset the dramatic differences in average DC balances shown in Table 2, and the income groups are much more similar on this relative basis.

Although peak DC balances relative to usual income did not diverge greatly by usual income within the 1941-1950 cohort when they were at the beginning of their retirement years, there are clear differences in lifecycle trajectories for DC balances across all cohorts, both before

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[16] These similarities across usual income groups helps to explain why Clark and Sabelhaus (2009) found that relatively modest changes in retirement ages, extending working lives by just a few months for many people, would be needed to completely offset the drop in asset values associated with the Great Recession. Similarly, Goda et al. (2011) found that although stock market fluctuations do affect expected retirement ages for workers close to retirement, the increase in respondent-reported expected time until retirement that occurred during the Great Recession cannot be explained by losses on financial assets alone.

and after retirement. There are also indications that within-cohort accumulation patterns are changing dramatically, especially for younger cohorts, as the lower-income groups are falling below the DC wealth to income ratios achieved by their predecessors at the same age in earlier periods.

Retirement wealth accumulation is much slower early in the lifecycle for lower-income families than it is for middle- and higher-income families. To some extent, this reflects the participation patterns described earlier, as fewer lower-income families participate in tax-preferred retirement saving at all ages. The differences in accumulated wealth relative to income are starker, however, as lower-income families approach (on average) balances equal to about one year's usual income around age fifty, while the next 45 and top 5 hit that benchmark in their mid-thirties. The trajectories after retirement age also seem to diverge, and again in a way that is consistent with changes in retirement plan participation at older ages. The suggestion is, of course, that lower-income families are more likely than other families to spend down their DC accounts after retirement. Some of the change in trajectory after retirement is due to the denominator (usual income) of course, as the different usual income groups exhibit different (usual) income trajectories after retirement as well.

As with participation rates, a key message that emerges from the within-cohort DC balance to income trajectories involves *for whom* retirement balances are failing to grow with income. In a world with declining DB coverage and less generous Social Security (at any given claim age) for all income groups, one would suspect the DC balance to income trajectories would lie always and everywhere above predecessor cohorts (if expected retirement ages are unchanged). The fact that middle-age families generally seem to be just keeping up with the cohorts ahead of them is therefore somewhat surprising, and suggestive that retirement

accumulation may indeed (in a relative sense) be slipping for many (again, holding expected retirement ages constant).

The observation that younger cohorts in the bottom half of the distribution and next 45 percent are not even keeping up with the cohorts ahead of them as they progress through the lifecycle is even more worrisome. In addition, middle-age families in the bottom half of the income distribution (notably the 1951-1960 cohort) do not seem to be going through the substantial run up in wealth to income ratios as they get close to retirement, as was the case for lower-income families in previous cohorts. This takeaway on recent divergence in the trajectories of DC balance to income ratios closely mirrors the findings on participation described above.

5. Economic Conditions and Retirement Wealth Accumulation

To what extent is tax policy towards retirement saving affecting trends in plan participation and wealth accumulation across birth cohorts and income groups? More importantly, are there changes in policy that might improve retirement preparedness for the younger families and lower-income families who are (apparently) falling behind their predecessors? Answering these sorts of questions necessarily involves considering the effects of overall economic conditions on retirement wealth accumulation, because the U.S. economy experienced a dramatic shock during the Great Recession, and seems to be on a very different growth trajectory in the on-going recovery.

One factor driving DC balance to income ratios is asset prices, particularly stock prices. Holding portfolio composition constant, volatility in stock prices has a mechanical impact on DC balance to income ratios. That is clear in the aggregate time series data (Figure 1) and also affects the values by cohort and income (Figure 6) though the three year gaps between SCF observations makes it difficult to discern trend from cycle. Still, and especially if SCF respondents have any lag in their perceptions about stock prices, values for DC balances in the past two surveys (2010 and 2013) reflect (relative to past trends) relatively poor stock market performance. Although we do not explore this effect further in the current paper, it is worth noting that it could cut both ways, because the belief that those stock market losses will never be recovered could lead to increased saving, in order to achieve the original DC balance to income ratios.

The other mechanical determinant of the DC balance to income ratios is income itself, and the Great Recession and slow-growth aftermath have had a significant impact on usual income growth, especially when viewed from the lifecycle perspective (Figure 7). The clear

takeaway is that the shocks to income levels and growth rates are most pronounced for the young and for lower- to middle-income families, though to some extent, almost every group has seen a reversal of fortunes since 2007. The fact that the cohort income lines fall below the predecessor cohort values in 2010 and 2013 shows that the younger families are failing to achieve even the same level of income as their predecessors, after having seen income levels surpassing those earlier cohorts prior to 2007.

Widespread slowing income growth has two distinct and competing effects on retirement wealth to income ratios. First, the denominator is mechanically reduced, so any given level of net saving and rate of return will yield a higher ratio than if income had grown. Second, the slowdown in income growth suggests that current resources are more constrained, and one would expect that retirement saving itself would fall. Indeed, this reaction may in fact be rational: if a lifecycle consumer believes that slow income growth is the new normal, and they are balancing consumption between working and retired periods, their target saving rate might fall. Separating these two effects is a key step in understanding how policy is affecting retirement wealth trajectories.

Although separating the effects of economic conditions and retirement tax policy requires a more comprehensive modeling framework, one simple exercise confirms that the conclusions above about the distribution of changes in retirement wealth. The exercise involves creating a lifecycle counterfactual that answers the question, "What would the lifecycle charts have looked like if past (age- and income-specific) growth rates remained in force after 2007?" SCF data for earlier cohorts at a given age for the 1995 through 2007 period are used to make projections for cohorts in 2010 and 2013.

The results of the counterfactual applied to income are in some ways not surprising, given the depth of the Great Recession and subsequent slow growth (Figure 8). In general, the counterfactual income levels (represented by the dotted lines) are well above the actual income levels (reproduced from Figure 7). One can interpret the gap between the dotted and solid lines as "lifecycle shortfall" in income growth, the changes relative to previous cohorts at the same age.

What may be surprising is that the counterfactual view suggests that the slowdown in income growth was much more widespread than indicated by the basic lifecycle charts. That is, the counterfactual gaps are generally large for all income and age groups, not just the young and lower-income groups. This is driven by the relative slowdown in average income growth at the top of the income distribution. Incomes were growing more rapidly at the top prior to the recession, and thus the relative drop is larger for many cohorts within that highest-income group.

The same counterfactual exercise can be applied to the DC balance to income ratios (Figure 9). Again, the growth rates for prior age/income groups are applied to the 2007 base to generate 2010 and 2013 counterfactuals, and the gap between actual and counterfactual outcomes are very informative. The fact that income growth slowed, mechanically lowering the denominator, is the dominant force for most cohort and income groups, and the actual and counterfactual ratios do not diverge sharply. One very notable exception to this pattern is the lowest-income group within the 1951-1960 birth cohort, the group moving through their mid-late fifties in the past two surveys. Data from the same income group at previous points in time (earlier cohorts at the same age) saw large increases in DC balances relative to income. This group, even though their incomes fell substantially during the 2007 to 2013 period, saw their DC balance to income ratio fall in line, meaning the numerator was actually decreasing.

Changes in DC balances over time depend on contributions, rates of return, and withdrawals, and a comprehensive analysis of retirement saving behavior requires separating the three, as well as bringing in other forms of retirement preparedness (DB plans and Social Security) and other balance sheet components. However, this preliminary investigation suggests that recent disappointing macroeconomic performance has revealed important concerns about the ability of the existing system of tax preferences for retirement saving, as embodied in the mostly voluntary DC system, to provide widespread retirement security.

The results here do not necessarily imply that a voluntary DC system is doomed to fail, and in no way suggests that the mostly DB system in place prior to the 1980s was superior. DB pensions have their own set of problems, which also have a distributional component. Career-long attachment to a particular job (or even industry) has become increasingly rare, especially among lower-income and younger workers. The value of a DB plan is very much tied to longevity within the plan.

The results here do suggest that DC plan design matters, in terms of rules governing employer offerings, inducements for participation and for setting contribution levels, and even early withdrawal provisions.[17] The results also suggest that adequate funding of Social Security should remain a key part of public policy toward retirement saving. It is by far the single largest component of saving for most families, and the most important key to their retirement security.[18]

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[17] See, for example, Carroll et al (2009), Argento et al (2014), and Bryant (2008).
[18] See, for example, Weller and Wolff (2005).

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Figure 1. Aggregate Retirement Wealth as a Percent of Aggregate Personal Income
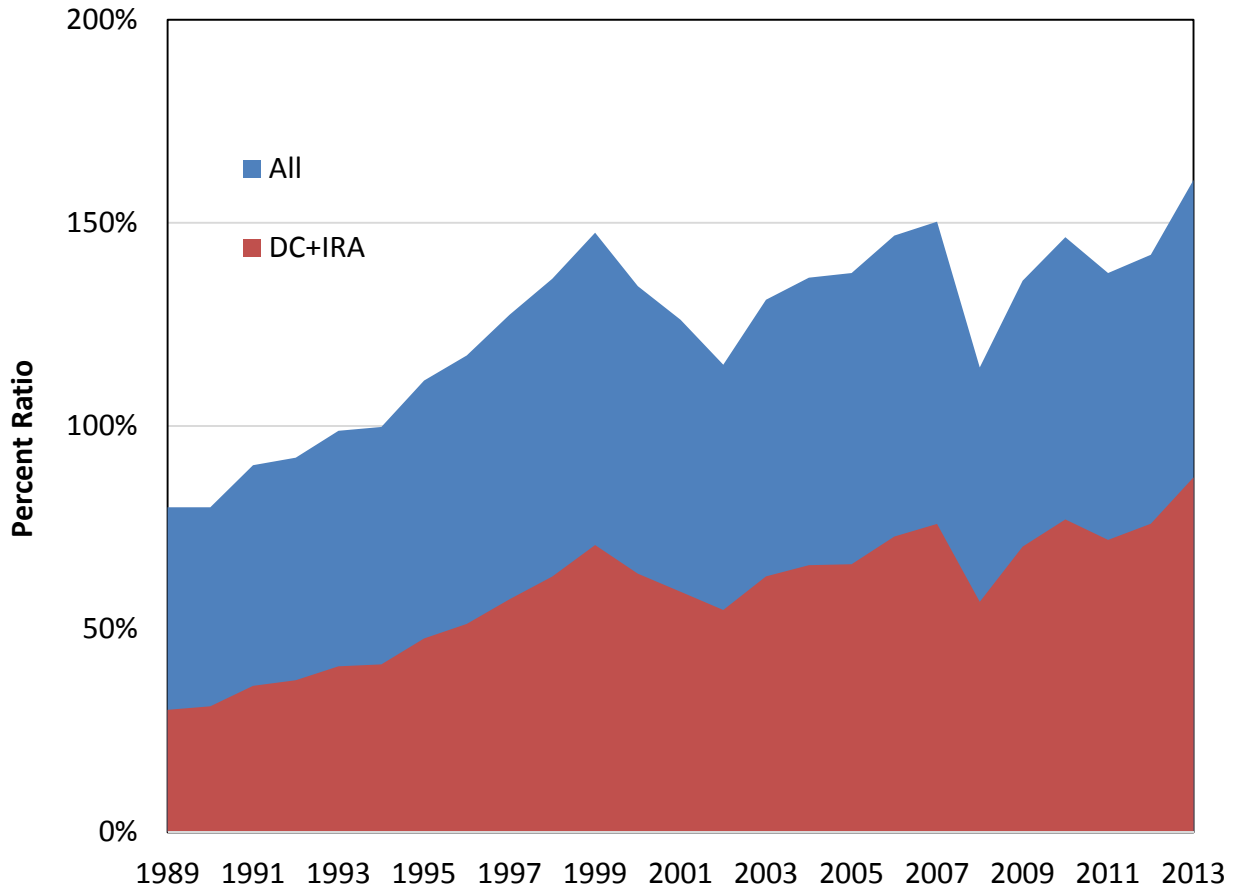
Source: Investment Company Institute and Bureau of Economic Analysis. Retirement assets include IRAs, private DC and DB pensions, government pensions, and annuities.

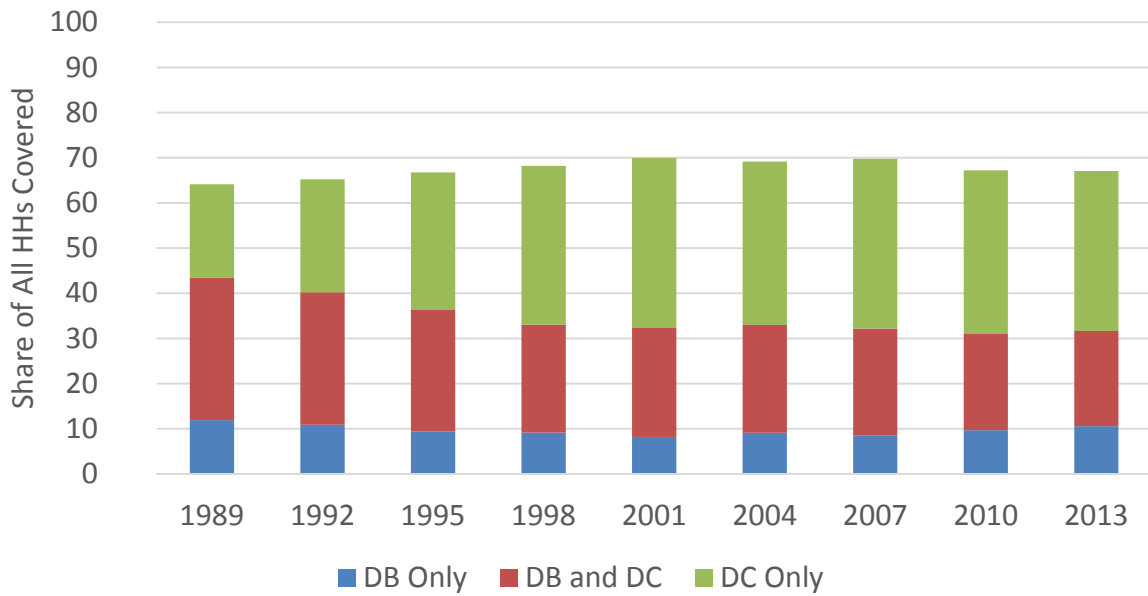Figure 2a. Aggregate Retirement Plan Participation, All Households, 1989-2013
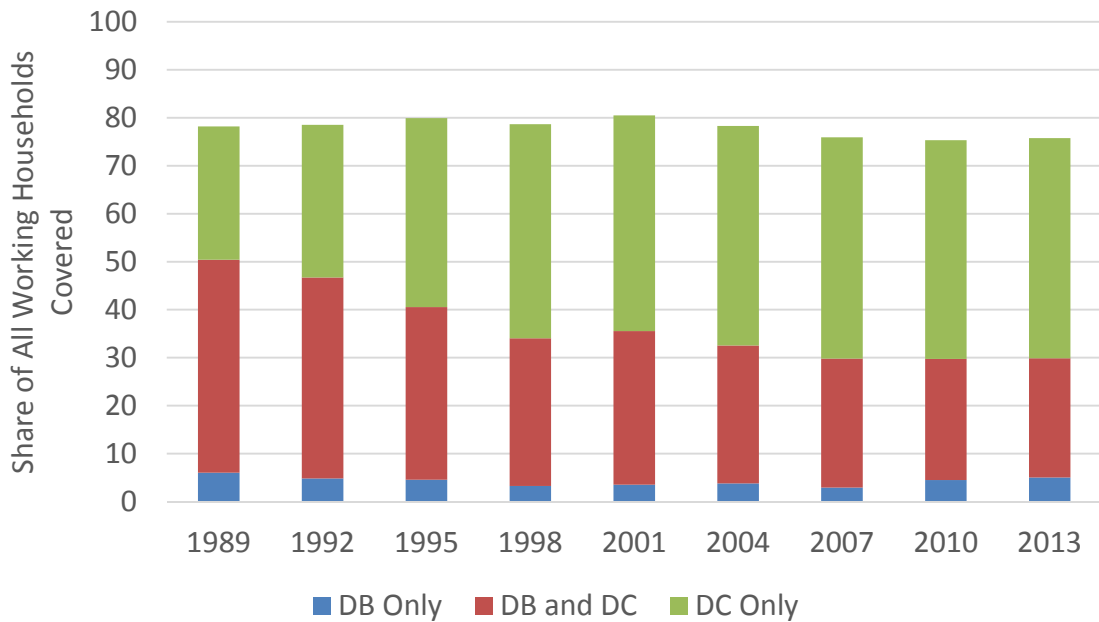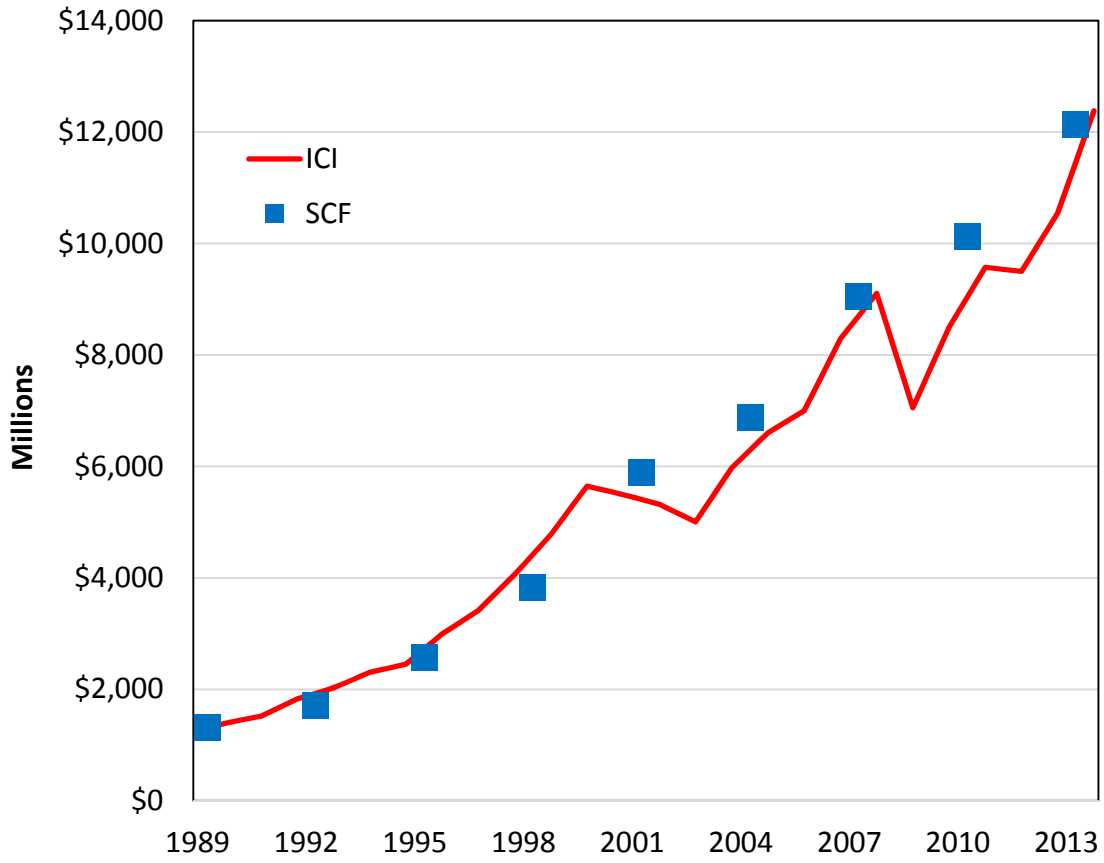

Figure 2b. Aggregate Retirement Plan Participation, Working Age Households (Household Head Aged 25-59), 1989-2013
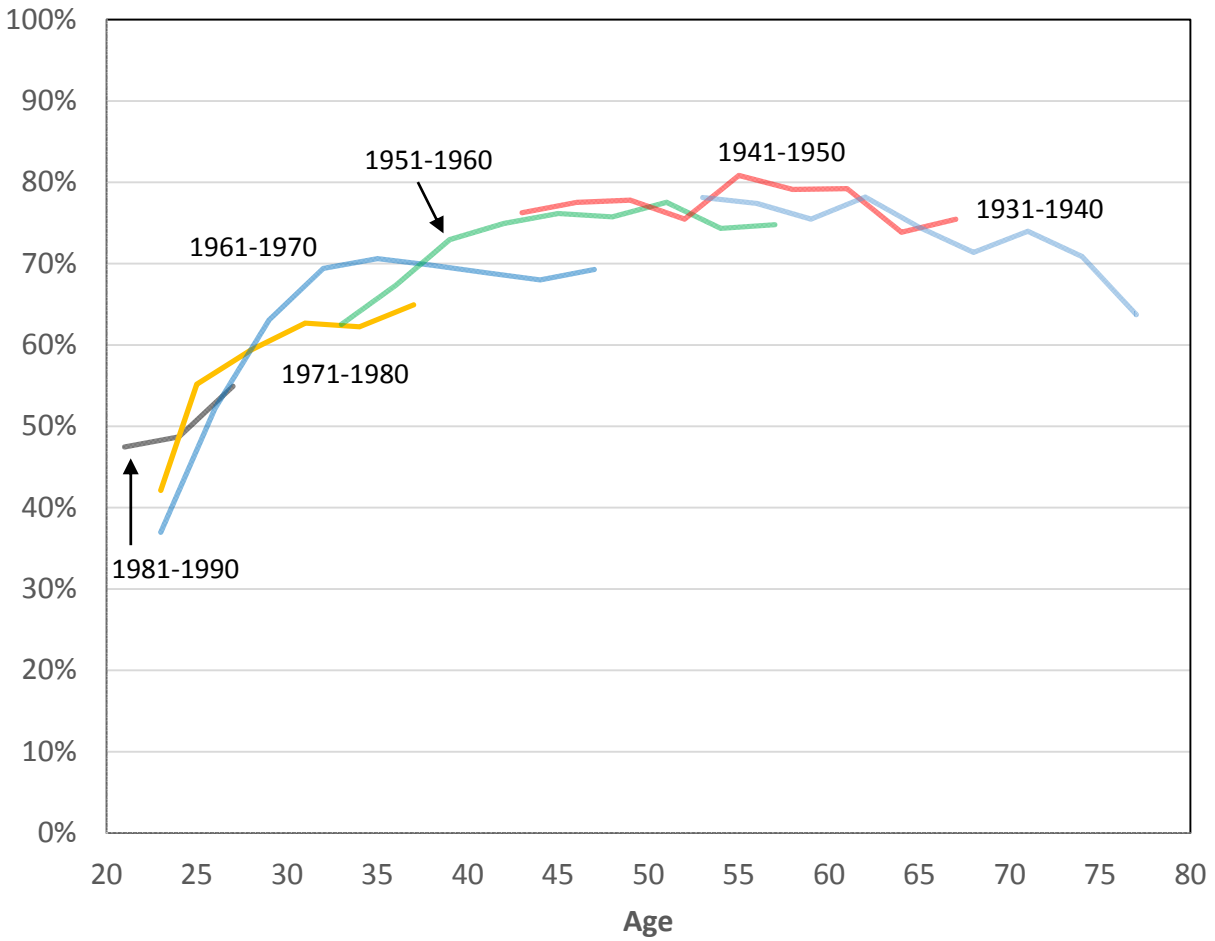

Source: Survey of Consumer Finances, 1989-2013. DB coverage includes any traditional pension benefits through a current or past job for any member of the primary economic unit (PEU). DC coverage includes IRA and DC pension coverage from a current or former employer in the (PEU).

Figure 3. Aggregate Investment Company Institute (ICI) and Survey of Consumer Finances (SCF) Balances in DC accounts and IRAs

Source: Investment Company Institute (ICI) and Survey of Consumer Finances (SCF).

Figure 4. Retirement Plan Participation by Cohort, 1989-2013

Source: Survey of Consumer Finances, 1989-2013
Note: Population grouped by birth year (displayed above) of household head. Retirement plan participation includes holding of an individual retirement account (IRA) or participation in defined benefit (DB) or defined contribution (DC) plan through a current or former employer.
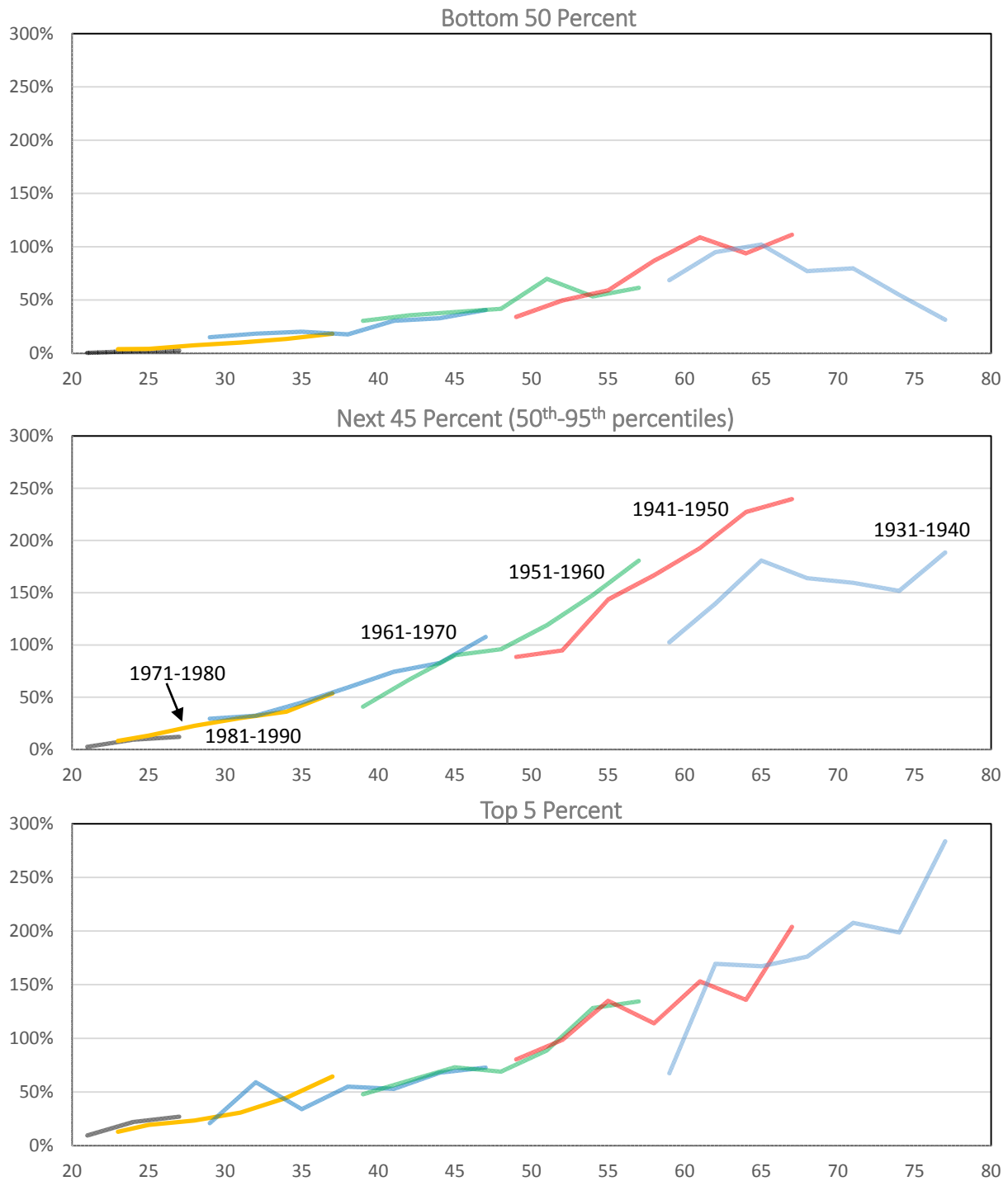
Figure 5. Retirement Plan Participation by Cohort and Usual Income, 1995-2013
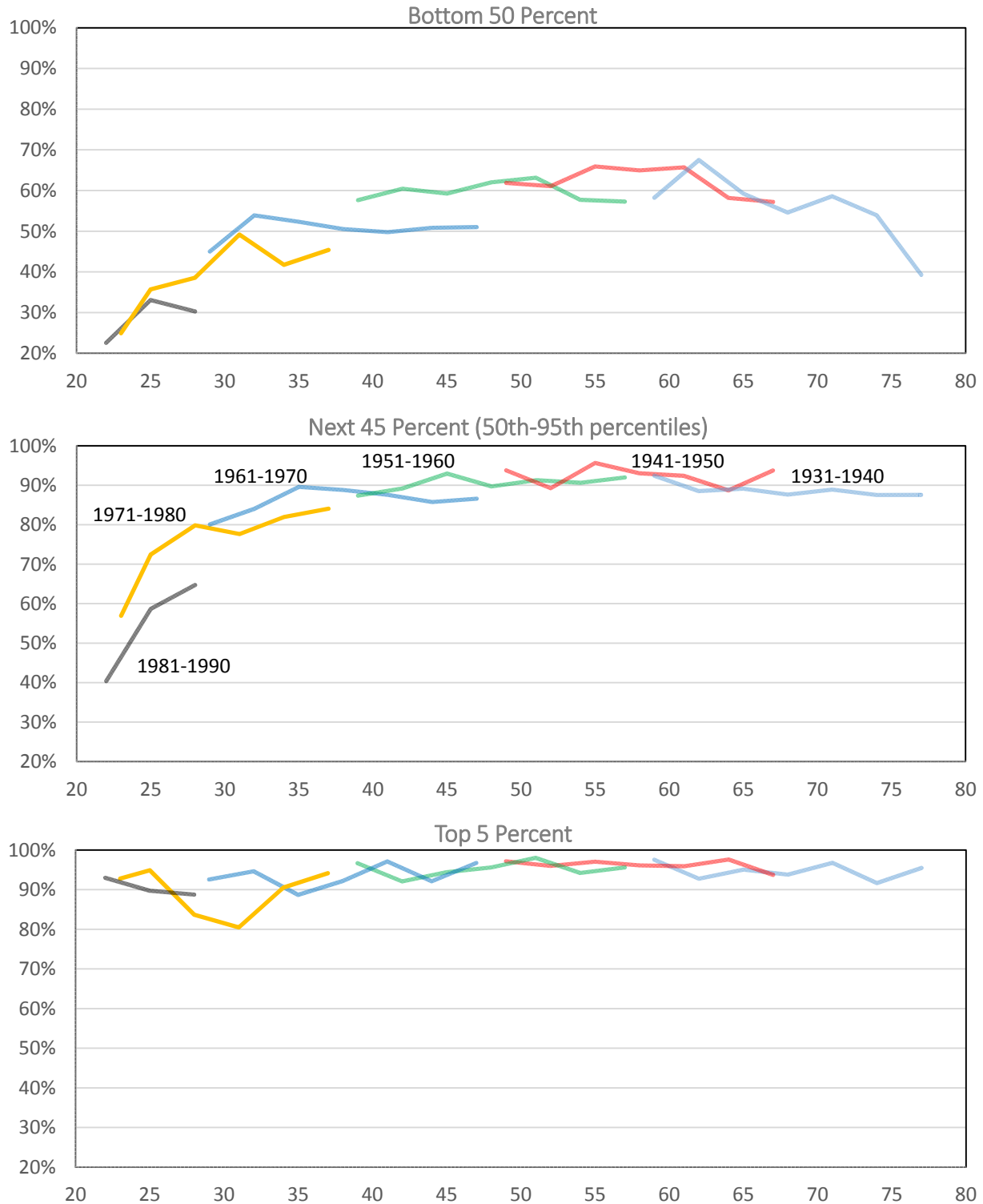
Source: Survey of Consumer Finances 1989-2013.
Note: Ranking determined by normal income distribution within each cohort. For definitions, see notes to Figure 4.

Figure 6. Ratio of Average DC Balances to Average Usual Income, by Cohort & Usual Income, 1995-2013

Bottom 50 Percent

Next 45 Percent (50th-95th percentiles)

1941-1950

1951-1960

1931-1940

1961-1970

1971-1980

1981-1990

Top 5 Percent

Source: Survey of Consumer Finances 1995-2013.
Note: Ranking determined by usual income distribution within each cohort. For definitions, see notes to Figure 3.

Figure 7. Average Usual Incomes by Cohort and Usual Income, 1995-2013
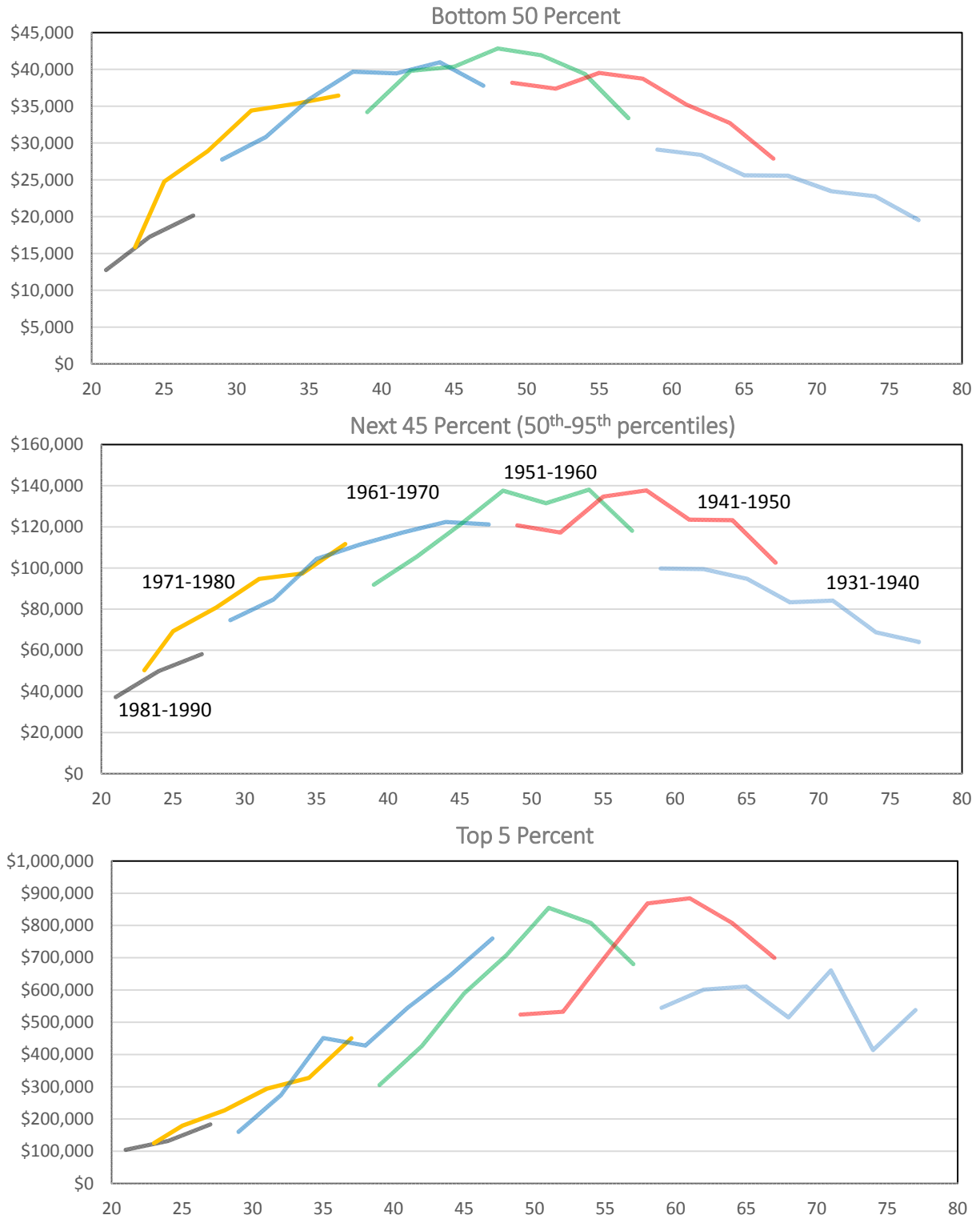
Bottom 50 Percent

Next 45 Percent (50th-95th percentiles)

1951-1960

1961-1970

1941-1950

1971-1980

1931-1940

1981-1990

Top 5 Percent

Figure 8. Average Usual Incomes, with Counterfactual Usual Income Growth by Cohort and Usual Income, 1995-2013

Bottom 50 Percent

Next 45 Percent (50th-95th percentiles)

1951-1960

1961-1970

1941-1950

1971-1980
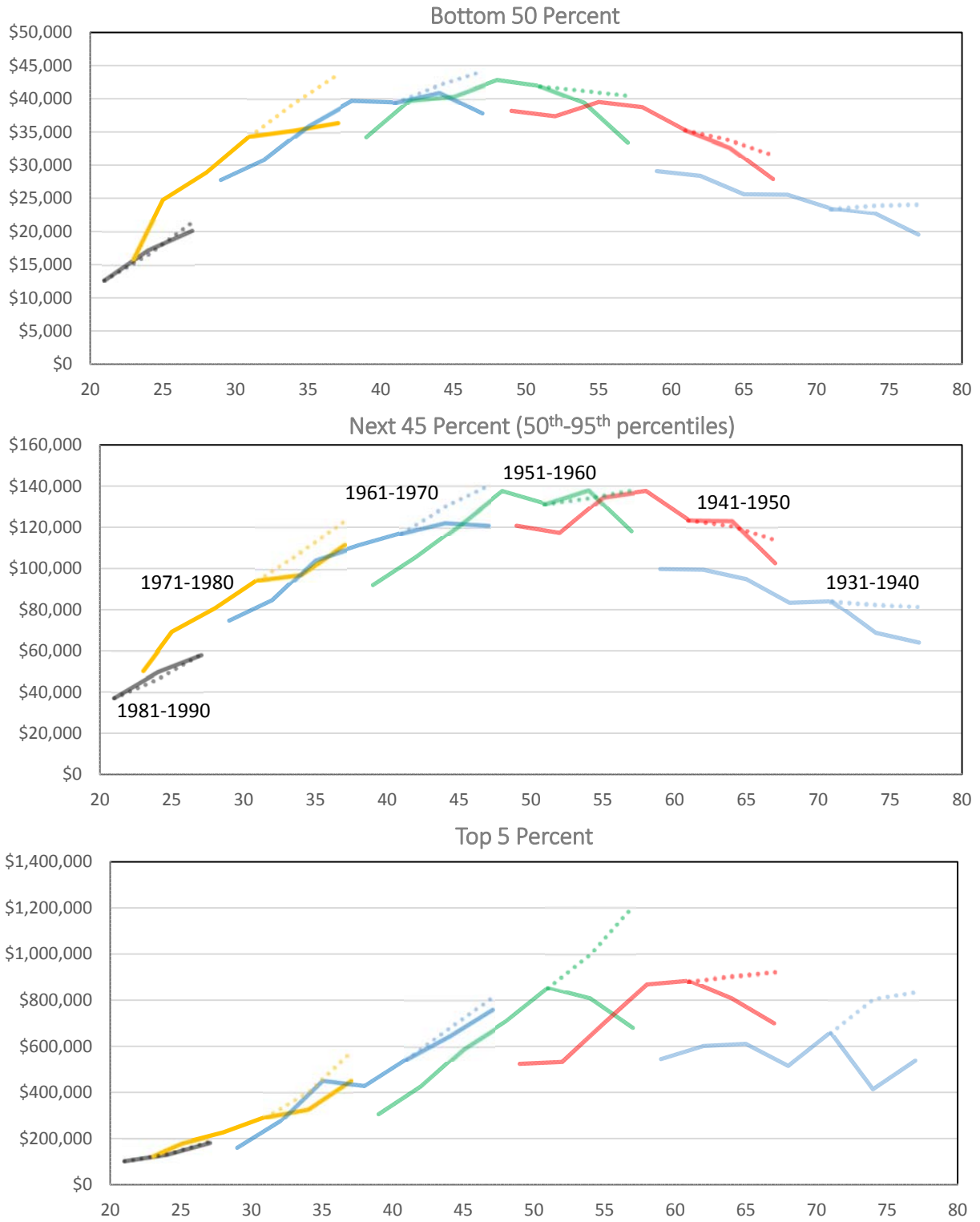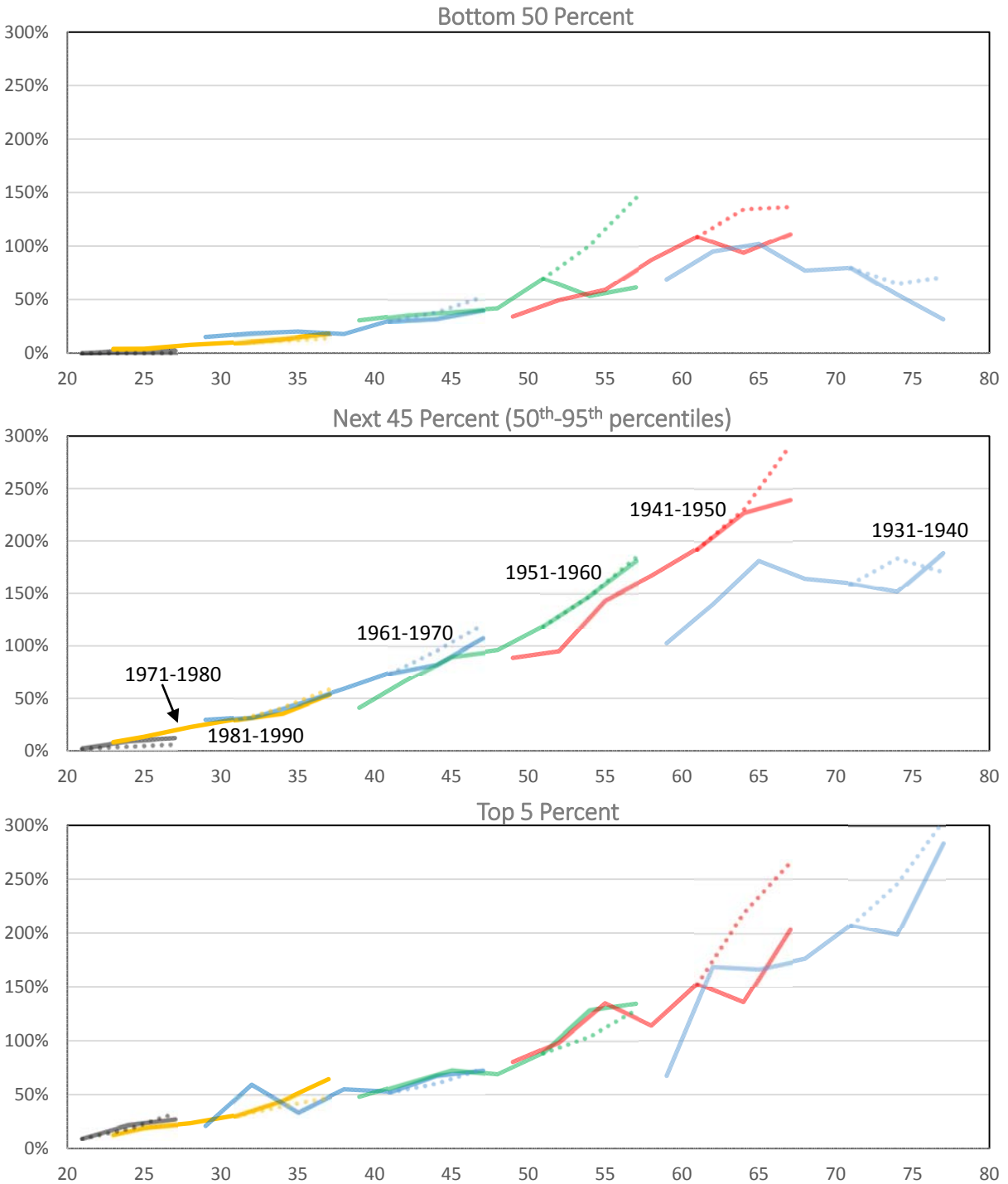
1931-1940

1981-1990

Top 5 Percent

Figure 9. Ratio of Average DC Balances to Average Usual Income with Counterfactual Growth, by Cohort & Usual Income, 1995-2013

Source: Survey of Consumer Finances 1995-2013.
Note: Ranking determined by usual income distribution within each cohort. For definitions, see notes to Figure 3.

Table 1. Type of Pension Coverage by Cohort and Usual Income, Working Age Families, 1995 and 2013

Retirement Plan Coverage	1995			2013			Change, 1995 to 2013		
	Bottom 50	Next 45	Top 5	Bottom 50	Next 45	Top 5	Bottom 50	Next 45	Top 5
Any Coverage	54	87	96	44	87	94	-9	-1	-2
DB Only	10	3	1	8	4	1	-1	1	0
DB and DC	19	41	45	8	32	23	-10	-9	-23
DC Only	25	43	49	28	51	70	2	7	20
DB, Conditional on Any Coverage	*53*	*51*	*48*	*38*	*42*	*25*	*-15*	*-9*	*-23*

Table 2. DC Balances by Cohort and Usual Income, 2013

		NORMAL INCOME GROUP								
		Bottom 50	Next 45	Top 5	Bottom 50	Next 45	Top 5	Bottom 50	Next 45	Top 5
Cohort	Age (2013)	Unconditional Mean			Conditional Median Balance			Conditional Mean Balance		
1981-90	28	500	7,000	49,300	1,700	7,500	27,400	3,900	14,500	57,900
1971-80	38	6,700	59,800	289,600	9,000	49,000	220,000	21,300	81,300	309,400
1961-70	48	15,300	130,400	552,200	17,000	100,000	440,000	43,500	167,600	571,700
1951-60	58	20,500	213,300	914,300	23,000	130,000	578,000	58,900	257,900	975,300
1941-50	68	31,000	245,800	1,426,300	63,200	170,000	974,300	110,800	337,700	1,530,500
1931-40	78	6,200	120,700	1,525,300	38,000	120,000	700,000	63,800	231,100	1,669,500

Source: Survey of Consumer Finances, 1989-2013.
Note: Ranking determined by usual income distribution within each cohort. For definitions, see notes to Figure 3.