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U.S. PENSIONS IN THE 2000S: THE LOST DECADE?

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The last three decades saw a sharp decline in traditional defined benefit (DB) pensions and a corresponding rise in defined contribution (DC) plans. Using the Survey of Consumer Finances from 1983 to 2010, I find that after robust gains in the 1980s and 1990s, pension wealth experienced a marked slowdown in growth from 2001 to 2007 and then fell in absolute terms from 2007 to 2010. Median augmented wealth (the sum of net worth, pensions, and Social Security wealth) advanced slower than median net worth from 1983 to 2007 and its inequality rose more, as DB wealth fell off. However, from 2007 to 2010, the opposite occurred. While median wealth plummeted by 41 percent and inequality spiked by 0.032 Gini points, median augmented wealth fell by only 21 percent and its Gini coefficient rose by only 0.009 points. The differences are due to the moderating influence of Social Security wealth.

JEL Codes: D31, H55, J32

Keywords: inequality, pensions, Social Security, wealth

1. INTRODUCTION

This paper has two primary objectives. One of the most dramatic changes in the retirement income system over the last three decades has been the replacement of many traditional defined benefit (DB) pension plans with defined contribution (DC) pensions. The first focus of the paper is to analyze the effects of the changeover in the pension system on the growth of pension wealth and time trends in overall wealth inequality from 1983 to 2007.

The second primary concern is how both pension wealth and Social Security wealth influenced wealth trends over the "Great Recession" of 2007–10. Wolff (2012) reports two stunning developments on the basis of a standard wealth measure. First, median wealth among all households dropped by 47 percent in real terms. Second, wealth inequality as measured by the Gini coefficient climbed from 0.834 to 0.870. Do these trends still hold up when we now add pension wealth and Social Security wealth to standard wealth to create augmented wealth? The empirical work is based on the Federal Reserve Board's Survey of Consumer Finances (SCF) for the years 1983, 1989, 2001, 2007, and 2010.

The study focuses on the age group 47–64 years. There are two reasons for this. First, there is complete data available for this group from 1983 to 2010. Second, this is the age group most affected by the transition of the pension system.

With regard to the first focus of the paper, I find that after robust gains in the 1980s and 1990s, pension wealth growth slowed substantially from 2001 to 2007. "Private augmented wealth," the sum of net worth and pension wealth, also

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showed a marked slowdown in growth during the years 2001 to 2007 in comparison to the 1980s and 1990s. Retirement wealth is also found to offset the inequality in standard household net worth. However, the results show that the inequality lessening effect of pensions diminished over time, from 1983 to 2007. The reason is the substitution of DC pensions, which are relatively unequal, for DB pensions, which are relatively equal, over time. As a result, the inequality of private augmented wealth increased more than that of standard net worth inequality from 1983 to 2007. These results hold up when Social Security wealth is included in household wealth. The growth rate of augmented wealth, the sum of net worth, pension wealth, and Social Security wealth, also slowed down in the 2001–07 period compared to the 1980s and 1990s. The results also generally hold up when projected future employer contributions as well as employee contributions to DC plans are included in the measure of wealth, when projected wealth at time of retirement is used, and when accrual retirement wealth is used.

With regard to the second main focus of the paper, wealth trends over the Great Recession, I find that pension wealth growth actually turned negative from 2007 to 2010. Private augmented wealth also experienced a substantial (absolute) drop from 2007 to 2010. As a result, the growth rate of augmented wealth also turned negative over the Great Recession, from 2007 to 2010. However, a key difference is that augmented wealth declined less in percentage terms than net worth over these years due to the moderating influence of Social Security wealth. Likewise, while the inequality of augmented wealth as measured by the Gini coefficient rose more than that of net worth from 1983 to 2007, the opposite was the case from 2007 to 2010, once again due to the moderating effects of Social Security wealth.

The next section of the paper (Section 2) provides a review of the pertinent literature on this subject. Section 3 describes the data sources and develops the accounting framework used in the analysis. Section 4 provides some historical background to the period under consideration. Section 5 investigates changes in pension wealth over these years. Section 6 focuses on time trends in private augmented wealth. In Section 7, I add Social Security wealth into the analysis and investigate changes in (total) augmented wealth. Section 8 provides a sensitivity analysis of these results to alternative concepts of retirement wealth. Concluding remarks are made in Section 9.

2. Literature Review

Several studies have documented changes in pension coverage in the United States, particularly the decline in DB pension coverage among workers over the last few decades. Bloom and Freeman (1992), using the Current Population Survey (CPS) for 1979 and 1988, were among the first to call attention to the drop in DB pension coverage. They reported that the percentage of all workers in the age group 25–64 covered by these plans fell from 63 to 57 percent over this period. Gustman and Steinmeier (1992) were among the first to document the changeover from DB to DC plans. On the basis of IRS 5500 filings between 1977 and 1985, they estimated that only about half of the switch was due a decline in DB coverage conditional on industry, size, and union status and that the other half was due to

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a shift in employment mix toward firms with industry, size, and union status historically associated with low DB coverage rates. Even and Macpherson (1994) also found a pronounced drop in DB pension coverage among male workers, particularly those with low levels of education.

A U.S. Department of Labor (2000) report found that a large proportion of workers, especially low wage, part-time, and minority workers, were not covered by private pensions. The coverage rate of all private sector wage and salary workers was 44 percent in 1997. Coverage of part-time, temporary, and low-wage workers was especially low. This appeared to be ascribable to the proliferation of 401(k) plans and the frequent requirement of employee contributions to such plans. Pension participation was found to be highly correlated with wages. While only 6 percent of workers earnings less than $200 per week had a pension plan, 76 percent of workers earning $1000 per week participated.

Using data from the CPS, Munnell and Perun (2006) reported a sharp drop-off in pension coverage between 1979 and 2004. In 1979, 51 percent of non-agricultural wage and salary workers in the private sector in the age group 25–64 participated in a pension plan. By 2004, that figure was down to 46 percent. The authors also found that the decline in pension coverage occurred for all five earnings quintiles, though it was particularly pronounced for the middle quintile. In general, these studies report an overall increase in pension coverage during the 1980s and 1990s despite the collapse of DB plans because of an offsetting rise in DC plans. However, they also indicate a drop off in pension coverage during the 2000s. I also find a rise in overall pension coverage among households from 1989 to 2001, followed by a modest decline from 2001 to 2007 and then a steep drop from 2007 to 2010.

With regard to the financial crisis of 2007–09, Gustman *et al.* (2009) offered a rather sanguine view of the effects of the stock market crash on retirement preparedness. Their findings indicated that although the consequences of the decline in the stock market were serious for those approaching retirement, the average person approaching retirement age was not likely to suffer a life changing financial loss from the stock market downturn of 2007–09. Using Health and Retirement Survey (HRS) data, they calculated trends in pensions among three cohorts: those aged 51–56 in 1992, called the HRS cohort; those aged 51–56 in 1998, called the war baby cohort; and those aged 51–56 in 2004, called the early boomer cohort. They found that pension coverage was much more extensive than was usually recognized. Over three quarters of households in the early boomer cohort were either currently covered by a pension or had pension coverage in the past. Pension wealth accounted for 23 percent of the total wealth (including Social Security wealth) of those on the verge of retirement. For those nearing retirement age, DC plans remained small. As a result, 63 percent of pension wealth held by those aged 51–56 in 2004 was in the form of a DB plan. (This contrasts with my computations of a 47 percent share in 2001 and a 41 percent share in 2007 of the age group 47–64.) Their figures were even higher for older cohorts: 75 percent for the HRS cohort and 65 percent for the war baby cohort. They argued that the fact that a higher share of pension wealth was in the form of DB pension wealth should cushion the drop in overall pension wealth resulting from the stock market crash.

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Several papers looked at the issue of whether DC plans substituted for (that is, "crowded out") other forms of wealth and whether there was any net savings derived from DC plans. Poterba, Venti, and Wise, in a series of papers (see, e.g., Poterba *et al.*, 1998, 2001), concluded that the growth of IRAs and 401(k) plans did not substitute for other forms of household wealth and, in fact, raised household net worth relative to what it would have been without these plans. Their results also suggest that the transition from DB to DC type plans increased pension wealth dramatically. In contrast, Gale, in a series of papers both by himself and with colleagues, found very little net savings emanating from DC plans. For example, Engen and Gale (2000), using data from the 1987 and 1991 SIPP, found that 401(k)s held by low earners may more likely represent additions to net worth than 401(k)s held by high earners, who held the bulk of this asset. Overall, only 0–30 percent of the value of 401(k)s represented net additions to private savings. Kennickell and Sunden (1999) found a significant negative effect of both DB plan coverage and Social Security wealth on non-pension net worth but concluded that the effects of DC plans, such as 401(k) plans, on other forms of wealth were statistically insignificant. Engelhardt and Kumar (2011), using detailed information on pensions and lifetime earnings in the 1992 wave of the HRS, estimated that each dollar of pension wealth was associated with a 53–67 cent decline in non-pension wealth. Most of the effect was concentrated in the upper quantiles of the wealth distribution.

With regard to the distributional effects of retirement wealth, Feldstein (1976), in a seminal paper on this subject, found on the basis of the 1962 Survey of Financial Characteristics of Consumers, that the inclusion of Social Security wealth led to a sharp reduction in measured wealth inequality. The Gini coefficient for the sum of net worth and Social Security wealth among families in age class 35–64 was 0.51, compared to a Gini coefficient of 0.72 for net worth.

Wolff (1987b) followed up by examining the distributional implications of both Social Security and private pension wealth. Using the 1969 Measurement of Economic and Social Performance (MESP) database, he showed that while Social Security wealth had a pronounced equalizing effect on the distribution of augmented wealth, pension wealth had by itself a much smaller equalizing effect. In particular, the addition of Social Security wealth to net worth reduced the overall Gini coefficient from 0.73 to 0.48, but the addition of pension wealth to the sum of net worth and Social Security wealth raised the Gini coefficient back to 0.66. The sum of Social Security and pension wealth had a net equalizing effect on the distribution of augmented wealth, but the effect was substantially less than that of Social Security wealth alone.

McGarry and Davenport (1997), using the 1992 wave of the HRS, found that pension wealth was only slightly more equally distributed than net worth and that adding pension wealth to net worth had an equalizing effect (with the wealth share of the top decile declining from 53 to 45 percent with the addition of pension wealth). Kennickell and Sunden (1999), using the 1989 and 1992 SCF, found a net equalizing effect from the inclusion of both private pension and Social Security wealth, reducing the share of total wealth held by the top 1 percent with a head younger than 65 in 1992 from 31 to 16 percent.

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3. Data Sources and Accounting Framework

This study relies on the 1983, 1989, 2001, 2007, and 2010 SCF conducted by the Federal Reserve Board. Each survey consists of a core representative sample combined with a high-income supplement.[1] The SCF provides considerable detail on both pension plans and Social Security contributions. The SCF also gives detailed information on expected pension and Social Security benefits for both husband and wife.[2]

The principal wealth concept used here is marketable wealth (or net worth), which is defined as the current value of all marketable or fungible assets less the current value of debts. Total assets are the sum of: (1) owner-occupied housing; (2) other real estate; (3) liquid assets like bank deposits; (4) financial securities; (5) life insurance; (6) DC pension plans, including IRAs, Keogh, and 401(k) plans; (7) corporate stock and mutual funds; (8) unincorporated businesses; and (9) trust funds. Total liabilities are the sum of: (1) mortgage debt; (2) consumer debt, including auto loans; and (3) other debt like student loans. I use the symbol NW to refer to standard net worth. It should be stressed that the standard definition of net worth includes the market value of DC pension plans. (We shall return to this point later on in the paper.)

There is no one "correct" measure of household wealth (see, e.g., Wolff, 1987a, for a discussion of alternative definitions). Here, I exclude consumer durables, such as automobiles, televisions, furniture, and household appliances. The reason is for consistency with the national accounts which treat expenditures on these items as consumption rather than investment. As a result, my wealth estimates will *differ* from the "standard" wealth estimates provided by the Federal Reserve Board, since the latter *include* the value of vehicles in their wealth definition (see, e.g., Kennickell and Woodburn, 1999). My own view is that it probably makes more sense to include the full range of consumer durables rather than only automobiles in a wealth measure as is done in the Canadian Survey of Consumer Finances.

A word should be said on why I use the SCF instead of the HRS, which has much more complete data on earnings histories and has employer-provided information on individual DB pension plans of each employee covered by these plans. There are three reasons. First, the SCF provides much better data on the assets and liabilities. Second, the SCF data date from 1983, whereas the HRS data start in 1992. Third, the age coverage of the HRS is limited whereas the SCF covers the whole population.

[1]See, for example, Kennickell and Woodburn (1999) for details on the construction of the weights. Another issue is the compatibility of the 1983 SCF with the later SCF files since the sample design and questionnaire for the 1983 SCF are different than those of the later surveys. This problem is not restricted to the SCF and is germane to other microdata surveys conducted over time (such as the CPS). I choose to use the 1983 SCF here. However, it should be stressed that the basic storyline here is essentially unchanged if the sample period is restricted to 1989–2007.

[2]The Federal Reserve Board also made its own estimates of both DB pension and Social Security wealth for 1983. I do not use these estimates in this paper but provide my own to be consistent with the method of the other years. Moreover, pertinent data on pensions and Social Security for 1983 are rather limited for households under the age of 46. Partly for this reason, I focus on the age group 47–64 in this paper.

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The imputation of both defined benefit pension wealth (DB) and Social Security wealth (SSW) involves a large number of steps, summarized below. Though I am focusing on the age group 47–64, I provide the methodology for both retirees and current workers, since some individuals in this age group are retired and currently receiving pension and/or Social Security benefits.

As with the concept of household net worth, there are alternative formulations of both DB and SSW and none is necessarily the "correct" measure (see Wolff, 1992, for further discussion of this point). I have elected to use the standard gross measure of both pension and Social Security wealth, as it is the conventional formulation since Feldstein (1974) first introduced the concept. Kennickell and Sunden (1999), for example, use net Social Security wealth, the difference between the gross value and the discounted value of future Social Security contributions. However, this formulation implicitly nets future contributions from future savings rather than future consumption, an assumption that may not be tenable.

It should also be noted that the definition of DB and SSW is based on the conventional "ongoing concern" treatment. It is assumed in this that employees continue to work at their place of employment until their expected date of retirement. An alternative is to use the accrual value in which DB and SSW are valued as of the current year on the basis of work experience *up to that date only*. The accrual method will produce lower values of both DB and SSW. Indeed, the accrual method and the ongoing concern treatment represent two extremes in the valuation of both DB and SSW. The latter treatment, in particular, relies on the assumptions that (1) the firm or organization remains in existence over time, and (2) the employee continues working at the enterprise. In Section 8, I present alternative measures of both DB and SSW on the basis of their accrual value.

3.1. *DB Pension Wealth*

For retirees r the procedure is straightforward. Let PB be the pension benefit currently being received by the retiree. The SCF questionnaire indicates how many pension plans each spouse is involved in and what the expected (or current) pension benefit is. The SCF questionnaire also indicates whether the pension benefits remain fixed in nominal terms over time for a particular beneficiary or are indexed for inflation. In the case of the former, DB pension wealth is given by:

$$DB_r = \int_0^{109-A} PB(1-m_t)e^{-\delta t}dt \tag{1a}$$

and in the latter case,

$$DB_r = \int_0^{109-A} PB(1-m_t)e^{-\delta^* t}dt \tag{1b}$$

where A is the current age of the retiree; m_t is the *cumulative* mortality rate from current age to time t conditional on age, gender, and race (that is to say, $1 - m_t$ is the probability of surviving from current age to time t); δ^* is the real annual discount rate, set to 2 percent; γ is the inflation rate is assumed to be 3 percent per year; $\delta = \delta^* + \gamma$ is the nominal annual discount rate, equal to 5 percent; and the

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integration runs from zero to the number of years when the retiree reaches an arbitrary age limit of 109.

Estimates of DB pension wealth (as well as Social Security wealth) are quite sensitive to the choice of inflation rate and discount rate. I choose a 3 percent inflation rate since it is very close to the actual annual change of the CPI-U index from 1983 to 2010. Moreover, I choose a 5 percent nominal discount rate because it likewise is close to the actual average annual rate of return on liquid assets over the same period. These two choices lead to a 2 percent *real* discount rate (the difference between the two rates). A higher real discount rate will lead to lower estimates of DB pension wealth (and likewise Social Security wealth), and, conversely, a lower discount rate will lead to higher estimates of these two variables.[3]

Among current workers w the procedure is more complex. The SCF provides detailed information on pension coverage among current workers, including the type of plan, the expected benefit at retirement or the formula used to determine the benefit amount (for example, a fixed percentage of the average of the last five years' earnings), the expected retirement age when the benefits are effective, the likely retirement age of the worker, and vesting requirements. Information is provided not only for the current job (or jobs) of each spouse but for up to five past jobs as well. On the basis of the information provided in the SCF and on projected future earnings, future expected pension benefits (EPB_w) are then projected to the year of retirement or the first year of pension eligibility. Then the present value of pension wealth for current workers w is given by:

$$DB_w = \int_{LR}^{109-A} EPB(1-m_t)e^{-\delta t}dt \tag{2}$$

where RA is the expected age of retirement and LR = A – RA is the number of years to retirement. The integration runs from the number of years to retirement, LR, to the number of years when the retiree reaches age 109.

It should be noted that the calculations of DB pension wealth for current workers are based on employee response, including his or her stated expected age of retirement. A couple of studies have looked at the reliability of employee-provided estimates of pension wealth by comparing self-reported pension benefits with estimates based on provider data. Using data from the 1992 wave of the HRS, both Gustman and Steinmeier (1999) and Johnson *et al.* (2000) found that individual reports of pension benefits tended to differ from those based on provider information. However, the latter also calculated that the median values of DB plans from the two sources were quite close (about a 6 percent difference). As a

[3]As an alternative, I also used a 3 percent real discount rate to estimate both DB pension and Social Security wealth. The general results contained in this paper are not materially altered by the use of this higher discount rate (results not shown). Another crucial choice is the selection of which mortality rates to use in the calculation of DB and Social Security wealth. I have used here the standard ones from the *Statistical Abstract of the United States* based on age, gender, and race. However, there are also available unofficial life expectancy estimates for individuals by age, gender, and income class (and even by educational attainment). As is well known, higher income (and more educated) individuals live longer on average than lower income (or less educated) ones. The use of mortality rates conditional on income (or education) will have the effect of increasing estimates of DB pension wealth and Social Security wealth of higher income (and better educated) individuals *relative to* lower income (and less educated) individuals.

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result, for *average* values of pension wealth, employee-provided estimates of expected pension benefits seem to be fairly reliable.

3.2. *Social Security Wealth*

For current Social Security beneficiaries r, the procedure is again straightforward. Let SSB be the Social Security benefit currently being received by the retiree. Again, the SCF provides information for both husband and wife. Since Social Security benefits are indexed for inflation, Social Security wealth is given by:

$$SSW_r = \int_0^{109-A} SSB\,(1-m_t)\,e^{-\delta^* t}dt \tag{3}$$

where it is assumed that the current Social Security rules remain in effect indefinitely. Separate imputations are performed for husband and wife and an adjustment in the Social Security benefit is made for the surviving spouse.

The imputation of Social Security wealth among current workers w is based on the worker's actual and projected earnings history estimated by a standard human capital regression equation. The steps are briefly as follows. First, coverage is assigned based on whether the individual expects to receive Social Security benefits and on whether the individual was salaried or self-employed. Second, on the basis of the person's earnings history, the person's Average Indexed Monthly Earnings (AIME) is computed. Third, on the basis of the rules current at the time of the survey year, the person's Primary Insurance Amount (PIA) is derived from AIME. Then,

$$SSW_w = \int_{LR}^{109-A} PIA\,(1-m_t)\,e^{-\delta^* t}dt. \tag{4}$$

As with pension wealth, the integration runs from the number of years to retirement, LR, to the number of years when the retiree reaches age 109.[4]

Here, too, it should be noted that estimates of SSW are based on reported earnings at a single point in time. These estimates are likely to be inferior to those based on longitudinal work histories of individual workers (see, e.g., Smith *et al.*, 2001, whose estimates are based on actual Social Security work histories). In fact, actual work histories do show more variance in earnings over time than one based on a human capital earnings function projection. Moreover, they also show many periods of work disruption that I cannot completely capture here. In contrast, I do have *retrospective* information on work history provided by the respondent. In particular, each individual is asked to provide data on the total number of years worked full-time since age 18, the number of years worked part-time since age 18, and the expected age of retirement (from both full-time and part-time work). On the basis of this information, it is possible to approximate the total number of full-time and part-time years worked over the individual's lifetime and use these figures in the estimate of the individual's AIME.[5]

[4]Note that I use δ^* in the equation since Social Security benefits are indexed to the CPI.

[5]Though I can approximate the *number* of years of full-time and part-time work for a given worker, I can not determine when in his or her work history periods of non-employment occurred.

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I can now define the different accounting measures to be used. Let "non-pension wealth" NWX be defined as marketable household wealth minus DC wealth. Then:

$$NWX = NW - DC. \tag{5}$$

Total pension wealth, PW, is given by:

$$PW = DC + DB. \tag{6}$$

Private augmented wealth PAW is then defined as the sum of NWX and total pension wealth:

$$PAW = NWX + PW. \tag{7}$$

The term "private augmented wealth" is used to distinguish contributions to wealth from private savings and employment contracts with both private and government employers from those of social insurance provided by the state—notably, Social Security. Augmented household wealth, AW, is given by

$$AW = NWX + PW + SSW. \tag{8}$$

4. Historical Background

The 1990s witnessed some remarkable events. The stock market boomed. On the basis of the Standard & Poor (S&P) 500 index, stock prices surged 171 percent between 1989 and 2001. Stock ownership spread and by 2001 over half of U.S. households owned stock either directly or indirectly. Real wages, after stagnating for many years, finally grew in the late 1990s. According to BLS figures, real mean hourly earnings gained 8.3 percent between 1995 and 2001.[6] The home ownership rate shot up from 62.8 percent in 1989 to 67.7 percent in 2001 according to SCF data.

However, 2001 saw a recession (albeit a short one). Moreover, the stock market peaked in 2000 and dropped steeply from 2000 to 2003, recovered in 2004, and then rebounded from 2004 to 2007 so that between 2001 and 2007 the S&P 500 was up by 6 percent in real terms.[7] Real wages rose very slowly from 2001 to 2007, with the BLS real mean hourly earnings up by only 2.5 percent; median household income also gained little, up by 1.6 percent.[8] On the other hand, housing prices rose sharply, with the median sales price of existing one-family homes up by 19 percent in real terms nationwide.[9] The home ownership rate continued to expand, though at a somewhat slower rate, from 67.7 to 68.6 percent.

[6]These figures are based on the Bureau of Labor Statistics (BLS) hourly wage series. The source is Table B-47 of the Economic Report, available at http://www.gpoaccess.gov/eop/tables09.html.

[7]The source is Table B-96 of the *Economic Report of the President, 2009*, available at http://www.gpoaccess.gov/eop/tables09.html.

[8]The source is Table B-33 of the *Economic Report of the President, 2009*, available at http://www.gpoaccess.gov/eop/tables09.html. The Census Bureau uses the CPI-U-RS series to convert to constant dollars. However, for this period, there is virtually no difference between the CPI-U and the CPI-U-RS.

[9]The source is Table 935 of the *2009 Statistical Abstract*, U.S. Bureau of the Census, available at http://www.census.gov/compendia/statab/.

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There was also robust growth in wealth during the 1990s (see Wolff, 2012, for details). After rising by 7 percent between 1983 and 1989, median wealth among all households shot up by another 16 percent from 1989 to 2001. Between 2001 and 2007, median wealth grew even faster, by 19 percent overall. Most of the increase (63 percent) in median net worth emanated from the pronounced rise in home prices. Mean net worth also showed a sharp increase from 1983 to 1989 of 15 percent and then, buoyed largely by rising stock prices, another surge of 44 percent to 2001. There was an additional rise of 20 percent by 2007.

Wealth inequality, after rising steeply between 1983 and 1989, remained virtually unchanged from 1989 to 2007. The share of wealth held by the top 1 percent rose by 3.6 percentage points from 1983 to 1989 and the Gini coefficient increased from 0.80 to 0.83. Between 1989 and 2007, the Gini coefficient was virtually unchanged—0.832 in 1989 and 0.834 in 2007.

The time trend for income inequality contrasts with that for wealth. Income inequality increased sharply between 1982 and 1988, with the Gini coefficient rising from 0.48 to 0.52. There was again a pronounced increase in income inequality between 1988 and 2000, with the Gini coefficient climbing from 0.52 to 0.56. However, the years 2000 to 2006 saw a slight abatement in the rise of income inequality. All in all, the years 2001 to 2007 witnessed a moderate increase in income inequality but almost no change in wealth inequality.

Then, the Great Recession and the associated financial crisis hit at the end of 2007 and asset prices plummeted. From 2007 to 2010, in particular, the median price of existing homes nose-dived by 24 percent in real terms.[10] Moreover, for the first time in 30 years, the share of households owning their own home fell, from 68.6 to 67.2 percent. Stock prices, based on the S&P 500 index crashed, with a net decline of 26 percent in real terms. The stock ownership rate also declined, from 49 percent in 2007 to 47 percent in 2010. Real wages, on the other hand, picked up from 2007 to 2010, with the BLS real mean hourly earnings increasing by 3.6 percent. In contrast, median household income in real terms declined sharply over this period, by 6.4 percent.

As noted above, median net worth among all households plummeted over these years, by 47 percent from 2007 to 2010. Mean wealth was also down but not nearly as much—only 18 percent. Wealth inequality also ramped upward over these years, with the Gini coefficient climbing from 0.834 to 0.870. In contrast, income inequality actually fell, with the Gini coefficient declining from 0.574 to 0.549 (see Wolff, 2012, for more details on wealth and income trends).

5. Pension Wealth

Table 1 highlights trends in pension coverage over the years 1983 to 2010. In this and subsequent tables, it should be noted that the unit of observation is the household. Moreover, as noted above, I show results only for the age group 47–64 ("middle-aged households"), since this is the age group most affected by the

[10]The source is National Association of Realtors, "Median Sales Price of Existing Single-Family Homes for Metropolitan Areas," available at: http://www.realtor.org/sites/default/files/reports/2012/embargoes/2012-q1-metro-home-prices-49bc10b1efdc1b8cc3eb66dbcdad55f7/metro-home-prices-q1-single-family-2012-05-09.pdf.

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TABLE 1

Trends in Pension Wealth for Age Group 47–64, 1983–2010

	1983	1989	2001	2007	2010
A. Percentage of Households with Pension Wealth					
1. DC accounts	12.3	28.3	62.0	63.8	59.6
2. DB plans	68.5	56.8	45.3	38.8	29.6
3. Pension wealth	70.3	67.5	75.9	74.1	69.2
B. Mean Household Pension Wealth (1000s, 2010 dollars)					
1. DC accounts	10.2	21.5	118.9	140.8	144.0
2. DB plans	94.7	105.4	104.0	96.1	68.9
3. Pension wealth PW	104.9	126.9	222.9	236.9	212.9
C. Gini Coefficients—Pension Holders Only					
1. DC accounts	0.732	0.726	0.714	0.681	0.700
2. DB plans	0.507	0.537	0.571	0.519	0.572
3. Pension wealth PW	0.524	0.577	0.637	0.617	0.659
D. Gini Coefficients—All Households in Age Group 47–64					
1. Pension wealth PW	0.666	0.715	0.724	0.716	0.764

Notes: Households are classified into age groups by the age of the head of household.
Pension Wealth PW = DB + DC.
Source: Own computations from the 1983, 1989, 2001, 2007, and 2010 SCF.

transformation of the pension system. Households are classified by the age of the household head. The picture that unfolds is a precipitous drop in DB coverage largely compensated by a sizeable increase in DC coverage, at least until 2007. Moreover, while mean pension wealth gained rapidly in the 1990s, its growth slowed down considerably in the years 2001 to 2007 and then showed an absolute decline over the Great Recession, from 2007 to 2010.

The share of middle-aged households with DC pension accounts skyrocketed over the years 1983 to 2001, from 12 to 62 percent, or by 50 percentage points (see Panel A of Table 1). Most of the gain occurred after 1989. The picture changes from 2001 to 2007 when there was only a slight increase in the DC coverage rate of 2 percentage points. Trends are different for DB pension wealth. The share of middle-aged households with a DB pension plan fell by 23 percentage points between 1983 and 2001 from 69 to 45 percent. The trend continued after 2001, with the share down by another 6.5 percentage points by 2007. The share of all middle-aged households covered by either a DC or a DB plan increased from 70 to 76 percent between 1983 and 2001. However, from 2001 to 2007, the share declined by almost 2 percentage points.

As shown in Panel B of Table 1 and Figure 1, there were huge increases in the average holdings of DC pension accounts, with the average value increasing by a factor of 12 between 1983 and 2001, to $119,000 (all dollar figures are in 2010 dollars, unless otherwise noted.) The rise in DC wealth slowed down from 2001 to 2007, with mean DC wealth increasing by (only) 18 percent. Opposite trends are again evident for DB pension wealth. The mean value rose by only 10 percent between 1983 and 2001. The years 2001 to 2007 saw losses in DB pension wealth, down by 7.5 percent.

Did the spread of DC type pension plans adequately compensate for the decline in traditional DB pension coverage? Average pension wealth PW (the sum

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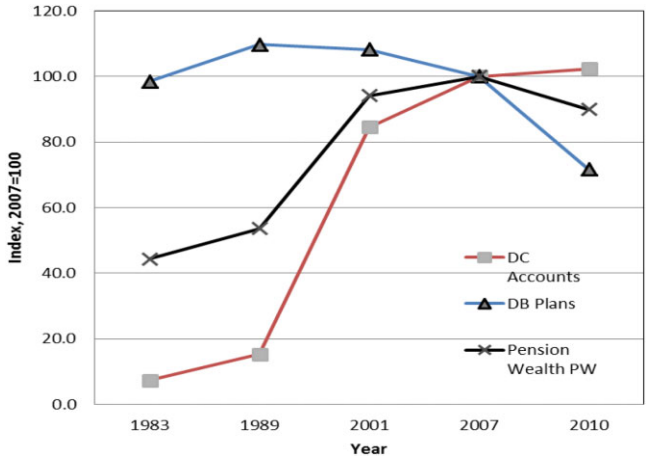

Figure 1. Time Trends in Pension Wealth, Ages 47–64, 1983–2010 (Index, 2007 = 100)

of DC and DB pensions) climbed by 113 percent among middle-aged households between 1983 and 2001 (also see Figure 1).[11] The growth in pension wealth slowed down markedly from 2001 to 2007, when mean PW inched up by only 6 percent.

What happened over the Great Recession? From 2007 to 2010, the share of middle-aged households with DC accounts fell off by 4 percentage points, down to 60 percent in 2010, as firms discontinued 401(k) plans and the like, start-ups of IRA plans slackened, and, in some cases, workers closed down IRA accounts in response to the financial stress of the Great Recession. The DB coverage rate also plummeted by 9 percentage points to 30 percent in 2010. This large fall-off over the Great Recession likely reflects the fact that many firms discontinued DB plans or converted existing DB plans into DC plans. As a result, the share covered by either a DC or a DB plan declined by another 5 percentage points to 69 percent in 2010.

Mean DC wealth, somewhat surprisingly, continued to expand over the Great Recession, though by a much smaller 2.3 percent, to $144,000 in 2010. In contrast, there was a precipitous drop in mean DB wealth by 28 percent from 2007 to 2010, largely reflecting the drop in DB coverage. By 2010, mean DB was only $69,000. As a result, mean PW fell in absolute terms, by 10 percent to $213,000.

With the transition in the pension system, did the inequality of pension wealth increase or decline? Pension inequality among DC plan holders is considerably greater than that among DB plan holders. As a result, the transition to DC plans raised overall pension inequality. This was true despite a decline in inequality in DC wealth by itself.

Panel C of Table 1 records the inequality of pension wealth among *pension holders only*. The inequality of holdings of DC accounts generally declined over the years from 1983 to 2007. The drop in the Gini coefficient from 1983 to 2007 was 0.050. Despite the reduction of inequality in DC wealth, the level of inequality in

[11]Median pension values are strongly affected by the share of households with pension wealth and, as a result, are not shown here.

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DC pension wealth was still very high in 2007. The Gini coefficient among DC pension account holders was 0.681 in 2007. This compares to a Gini coefficient for net worth of 0.834. However, the period from 2007 to 2010 saw a reversal in this trend, with the Gini coefficient for DC wealth rising by 0.018 points to 0.700. This change likely reflects the fact that lower paid workers either reduced their contributions to DC accounts or withdrew money from these accounts, particularly IRAs, while higher paid workers continued to contribute money into their DC accounts.

The inequality of DB wealth did not show a clear time trend over the years 1983 to 2010 but a fair amount of year-to-year variation. However, when we consider total pension wealth among pension holders, we find a sharp increase in inequality from 1983 to 2010, of 0.135 Gini points, despite the net decline in DC inequality over these years and the lack of a clear time trend in DB inequality. On the surface, these results may appear rather paradoxical. However, the explanation emanates from the fact that DC wealth inequality is considerably higher than DB wealth inequality. In 2007, for example, the Gini coefficient for DC wealth among those with a DC plan was 0.681, compared to only 0.519 for DB plan holders. The Gini coefficient for the sum of DB and DC wealth is equal to a weighted sum of the Gini coefficients for DB and DC individually (plus an interaction term), where the weight is equal to the share of each component in total pension wealth. The rising share of DC wealth in total pension wealth over time, from 10 percent in 1983 to 68 percent in 2010, thus led to a rise in the Gini coefficient in overall pension wealth, despite the fact that the Gini coefficient for DC wealth declined over time and that for DB wealth showed no clear time trend.

This relationship can, perhaps, be seen most clearly by a decomposition of the coefficient of variation. For any variable $X = X_1 + X_2$,

$$CV^2(X) = p_1^2 CV^2(X_1) + p_2^2 CV^2(X_2) + 2CC(X_1, X_2)$$

where $\bar{X}_1$ and $\bar{X}_2$ are sample means, $\bar{X} = \bar{X}_1 + \bar{X}_2$, CV is the coefficient of variation (the ratio of the standard deviation to the mean), CC is the coefficient of covariation, defined as the ratio of the covariance to $\bar{X}^2$, $p_1 = \bar{X}_1/\bar{X}$, and $p_2 = \bar{X}_2/\bar{X}$. The interaction term principally reflects the correlation coefficient between DC and DB wealth. The correlation coefficient also rose over time, from 0.19 in 1983 to 0.34 in 2007 but then fell off to 0.17 in 2010. As a result, the rising interaction term also made a positive (albeit modest) contribution to the growth in overall pension wealth inequality from 1989 to 2007 but acted as an offset to rising PW inequality from 2007 to 2010.

When the sample is extended to *all* households (including non-pension holders), the increase in PW inequality is less marked, an increase of the Gini coefficient of 0.098 from 1983 to 2010 compared to 0.135 for pension holders only (Panel D of Table 1). The major difference stems from the 1989–2001 period when PW inequality among all households grew appreciably less than among pension holders (the increase in the Gini coefficient was very close between the two during the other periods). The difference for the 1989–2001 period reflects the relatively large increase in the share of households with pension wealth (8.4 percentage points).

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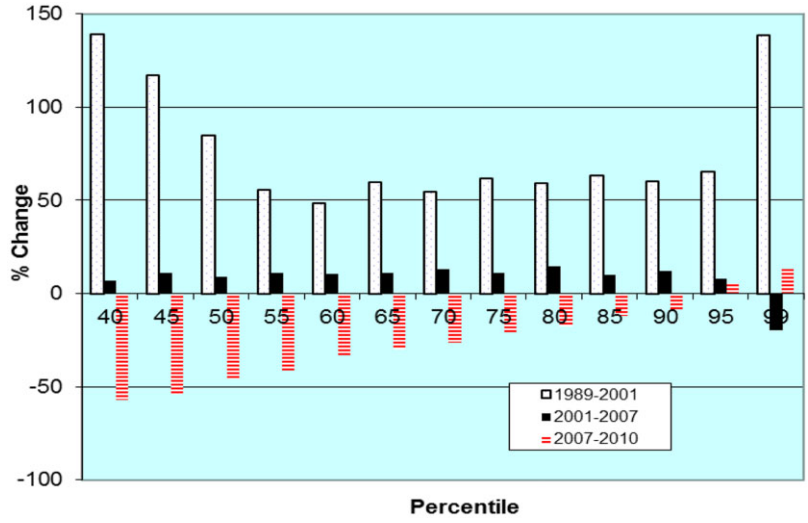

Figure 2. Percentage Change in Pension Wealth PW (in 2010$) by PW Percentile and Period, Ages 47–64

Figure 2 provides further details on the change in the distribution of pension wealth among the age group 47–64 by period. There were large gains in pension wealth over the 1989–2001 period at all percentiles, reflecting the increase in the share of households with a pension plan and the rising value of PW. However, the overall pattern is U-shaped. The percentage gain declined from 139 percent at the 40th percentile to 49 percent at the 60th percentile and then increased to 139 percent at the 99th percentile.[12] These results illustrate that the largest growth of pension wealth occurred at both the bottom and the top of the pension wealth distribution. As a result, overall pension wealth inequality remained almost unchanged over these years. From 2001 to 2007, PW showed much more modest gains at all percentiles (from about 7 to 15 percent). These results too accord with the finding that the Gini coefficient for PW changed very little over this period as well. The pattern is very different for the 2007–10 period, when PW decreased at all percentiles except the 95th and above. In this case, percentage changes were far lower (that is, more negative) at lower PW percentiles—indeed, percentage changes rose almost monotonically with PW percentile. These results are consistent with the finding of a sharp increase in the Gini coefficient for PW over these three years.

6. Trends in Private Augmented Wealth

Private augmented wealth (PAW) is the sum of net worth NW and DB and represents the resources available to households for retirement from private sources—their own wealth accumulations and private (as opposed to public) pension funds. The use of this variable will also allow us to isolate the effects of

[12]Results are shown for only the 40th percentile and above because below this point values are predominantly zero.

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TABLE 2
TIME TRENDS IN AUGMENTED WEALTH, AGE GROUP 47–64, 1983–2010

	1983	1989	2001	2007	2010
A. Mean Values (1000s, 2010 dollars)					
1. Non-pension net worth (NWX)	447.1	473.3	674.7	781.0	647.4
2. Net worth (NW)	459.4	501.6	736.7	844.7	707.0
3. Private augmented wealth PAW	553.5	607.1	840.7	940.9	775.9
4. Social Security wealth SSW	166.7	145.6	227.1	226.8	237.6
5. Augmented wealth AW	719.7	752.6	1067.8	1167.7	1013.5
B. Median Values (1000s, 2010 dollars)					
1. Net worth (NW)	133.4	164.0	169.4	217.2	128.8
2. Private augmented wealth PAW	226.4	238.6	262.3	298.5	179.0
3. Social Security wealth SSW	156.8	145.3	217.1	205.9	215.4
4. Augmented wealth AW	383.5	392.5	500.0	510.5	405.3
C. Gini Coefficients					
1. Net worth (NW)	0.761	0.775	0.798	0.795	0.827
2. Private augmented wealth PAW	0.688	0.721	0.756	0.758	0.797
3. Social Security wealth SSW	0.297	0.314	0.297	0.305	0.307
4. Augmented wealth AW	0.574	0.619	0.637	0.650	0.659
D. Composition of Augmented Wealth (%)					
1. Non-pension net worth (NWX)	62.1	62.9	63.2	66.9	63.9
2. DC accounts	1.7	3.8	5.8	5.5	5.9
3. DB plans	9.5	7.5	4.2	3.3	2.9
4. Social Security wealth SSW	23.2	19.3	21.3	19.4	23.4

Notes: Households are classified into age groups by the age of the head of household.
Private Augmented Wealth PAW = NWX + PW.
Augmented Wealth AW = NWX + PW + SSW.
Source: Own computations from the 1983, 1989, 2001, 2007, and 2010 SCF.

pensions, particularly DB plans, on wealth trends before introducing Social Security wealth into the concept of wealth.

The results indicate that with the dismantling of the DB pension system, PAW grew slower than household net worth from 1983 to 2007 but declined to about the same degree over the Great Recession. Moreover, inequality in the distribution of PAW increased more than that of net worth from 1983 to 2007 and then again from 2007 to 2010.

As noted in Section 4, there was very strong growth in overall net worth during the 1980s and 1990s and over the 2001–07 period and then a collapse from 2007 to 2010. The pattern is very similar for age group 47–64. Mean net worth for this age group rose by 84 percent from 1983 to 2007, while the median increased by 63 percent overall (see Table 2). When I exclude DC wealth to obtain NWX, I find that mean NWX rose by a lesser amount from 1989 to 2007, 54 percent, compared to 68 percent for NW, while median NWX was up by only 6 percent, compared to 32 percent for NW (see Table 2). It is at once clear how important DC plans were for the growth of net worth. This is not to say, of course, that households would not have accumulated wealth in alternative instruments in the absence of DC plans. However, the accumulations were likely to have been less for two reasons. First, savings in DC plans are tax-sheltered, which means that they accumulate at a higher rate in DC plans, *ceteris paribus*, than in taxable investments. Second, the value of employer provided DC plans, like 401(k)s, also incorporates the contributions made by employers.

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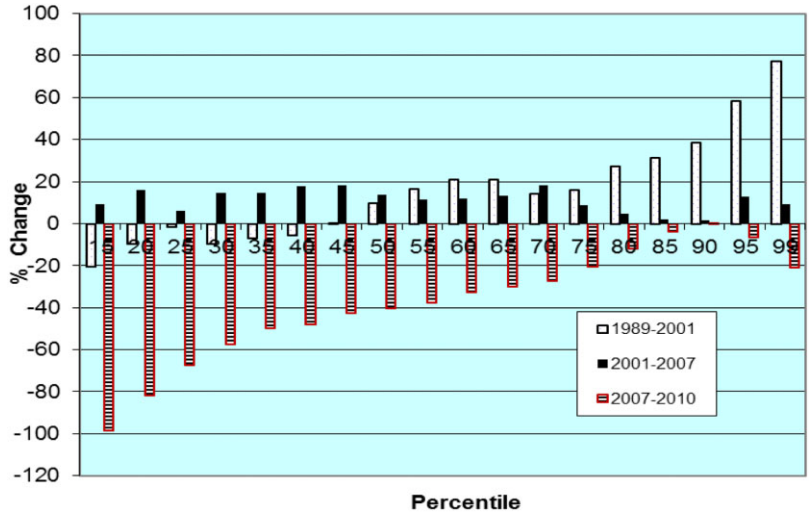

Figure 3. Percentage Change in Private Augmented Wealth (2010$) by PAW Percentile and Period, Ages 47–64

From 2007 to 2010, mean wealth fell by 16 percent and the median by a whopping 41 percent. It might, at first blush, seem puzzling that median wealth fell so much more than housing prices (24 percent) or stock prices (26 percent) over these years. The reason is the high degree of leverage of the middle three wealth quintiles within this age group in 2007. Their ratio of debt to net worth was 28 percent (compared to 15 percent for all households in the age group). The high degree of leverage thus magnified the asset price declines, resulting in an even greater drop in median wealth than in asset prices.

In comparison, mean PAW was up by 70 percent between 1983 and 2007, lower than that of net worth (84 percent), while its median value increased by 32 percent, in this case much slower than that of net worth (63 percent). From 2007 to 2010, mean PAW declined by 18 percent, slightly greater than that of net worth, while median PAW plunged by 40 percent, about the same as that of net worth (also see Figure 3).

The differences between the two measures from 1983 to 2007 reflect the much lower gains in the value of DB plans over these years. Generally speaking, households fared worse in terms of PAW than in terms of conventional net worth between 1983 and 2007. This finding indicates that the explosive growth of DC plans after 1989 did not fully compensate for the collapse of DB plans at least in terms of the growth of household wealth.

Another notable finding is that median PAW grew much slower than mean PAW from 1983 to 2007, with mean PAW gaining 70 percent and median PAW advancing by only 32 percent. Insofar as the median is more reflective of the welfare of the average household than the mean, these results indicate lower growth in welfare at the middle than indicated by mean values. They also suggest rising inequality in PAW, as we shall now see.

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Indeed, the attrition of DB plans did lead to a rise in wealth inequality. The reason is that DB wealth is fairly equalizing, as was seen above, and its erosion helped fuel a rise in wealth inequality. In 2007, the Gini coefficient for net worth among middle-aged households was 0.795 while that for PAW was 0.758 (see Panel C of Table 2). The higher level of inequality of net worth in comparison to PAW reflects the fact that DB pension wealth is distributed more equally than net worth. It was also the case that the equalizing effect of DB pension wealth lessened with the passage of time. Whereas the Gini coefficient for net worth among middle-aged households increased by 0.033 points over the years from 1983 to 2007, that for PAW advanced much more, by 0.070 points. Alternatively, adding DB wealth to NW resulted in a 0.073 decline in the Gini coefficient in 1983 and only a 0.036 decrease in 2007.[13]

From 2007 to 2010, the Gini coefficient for net worth among the age group 47–64 climbed by 0.032 points, about the same as that for net worth among all households. The Gini coefficient for PAW among the age group 47–64 increased by 0.39 points, somewhat more than that of net worth. The difference in Gini coefficients between net worth and PAW also fell off, from 0.036 to 0.030. The evidence thus indicates that the equalizing effect of DB wealth continued to wear off over the Great Recession. The reason is the continued (and precipitous) decline in DB wealth of 28 percent over the three years.

Figure 3 provides a closer look at the size distribution of PAW among middle-aged households in 1989, 2001, 2007, and 2010. Here it becomes quite clear that the major gains over the 1989–2001 period were made by households at the high end of the wealth distribution. Indeed, comparing the size distributions in the two years at different percentile levels, we find an almost monotonic relation between percentile level and percentage change in PAW over the period, from –20 percent at the 15th percentile to 77 percent at the 99th percentile. Over the second period, 2001–07, the percentage growth in PAW was positive at all percentiles but with no discernible pattern. These results are consistent with the finding of a rising Gini coefficient over the earlier period and little change over the second. In contrast, from 2007 to 2010, the percentage change in PAW was negative at almost all percentiles (with the exception of the 90th where it was zero). However, once again, there was an almost positive monotonic relationship between percentile and the percentage change in PAW, which is consistent with the finding of rising inequality in PAW over these years.

7. Social Security and Augmented Wealth

I now turn to an appraisal of what happened to augmented wealth (AW), the sum of net worth, pension wealth, and Social Security wealth. AW is the most comprehensive measure of the full set of resources available for retirement, and so its change over time is of considerable interest when considering trends in retirement adequacy. Moreover, an analysis of trends in AW will allow us to determine

[13]The use of a higher (lower) discount rate in the calculation of DB pension wealth would have lowered (raised) the value of DB pension wealth and consequently increased (decreased) the measured inequality of PAW. Correspondingly, the use of a higher (lower) discount rate would have led to a lower (higher) increase in the Gini coefficient for PAW between 1983 and 2007.

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whether the basic findings with regard to PAW are changed when Social Security wealth is included in the definition of household wealth. I find that whereas there was rapid growth in AW during the 1990s, a slowdown occurred over the 2001–07 period, and from 2007 to 2010 there was an absolute decline in AW. Moreover, median AW showed slower growth over time than mean AW. In fact, from 2007 to 2010, median AW showed a much larger drop than mean AW. Both findings are similar to those reported for PAW.

Before we proceed to a discussion of augmented wealth, it is useful to say a few words about trends in Social Security wealth (SSW). Mean SSW among middle-aged households rose by 36 percent between 1983 and 2001 (see Table 2). This compares to a 113 percent gain in mean PW. The increase in median SSW was very close to that of mean SSW—a reflection of relative constancy in SSW inequality over time.[14] The rise in SSW over this period largely reflects increasing real wages, particularly in the late 1990s, and rising longevity. This was offset, in part, by the increase in the age at which full Social Security benefits are received from age 65 to age 67 for persons born after 1938 and the rising share of minorities in the labor force, whose life expectancy and average earnings are lower than those of whites.

SSW averaged $227,000 (in 2010 dollars) in 2007 among the age group 47–64. This compares to a mean NW of $845,000 and mean PW of $237,000. Median SSW in 2007 was $206,000—close to that of mean SSW. This suggests a normal or close to normal distribution of SSW. Moreover, median SSW was about the same as median NW ($217,000). The years 2001 to 2007 witnessed almost no growth in SSW. Indeed, mean and median SSW fell slightly among middle-aged households. This turnaround is largely attributable to the wage stagnation of this decade as well as to the increasing age at which full Social Security benefits were received. Another factor is the increasing share of minorities in the workforce. Additional factors are the higher unemployment rates of the 2000s compared to the 1990s and the drop in the median retirement age compared to the 1990s. Both of these led to fewer years of employed work life. Moreover, though longevity increased over this period, the rate of increase slowed down relative to the 1990s.

The years 2007 to 2010 witnessed small increases in both mean SSW (4.8 percent) and median SSW (4.6 percent). The likely reasons are that even though unemployment rose over these years, real wages, as noted in Section 4 above, actually picked up and life expectancy also increased, particularly for minorities.

The inequality of SSW was, not surprisingly, much lower than that of net worth or pensions (see Panel C of Table 2). In 2007, the Gini coefficient for SSW among middle-aged households was 0.31, compared to 0.80 for NW and 0.72 for PW. The inequality of SSW was relatively unchanged from 1983 to 2010.

As noted above, mean net worth among middle-aged households rose by 60 percent between 1983 and 2001, while median net worth increased by 27 percent. When DB pension wealth is added in to create PAW, the mean increases by 52

[14]A small decline in both mean and median SSW for middle-aged households can be seen in the data for the period from 1983 to 1989.This decrease in SSW probably reflects the decline in average real wages over the period according to the BLS real hourly wage series, as well as the increase in the normal retirement age from 65 to 67 according to new Social Security legislation of the period.

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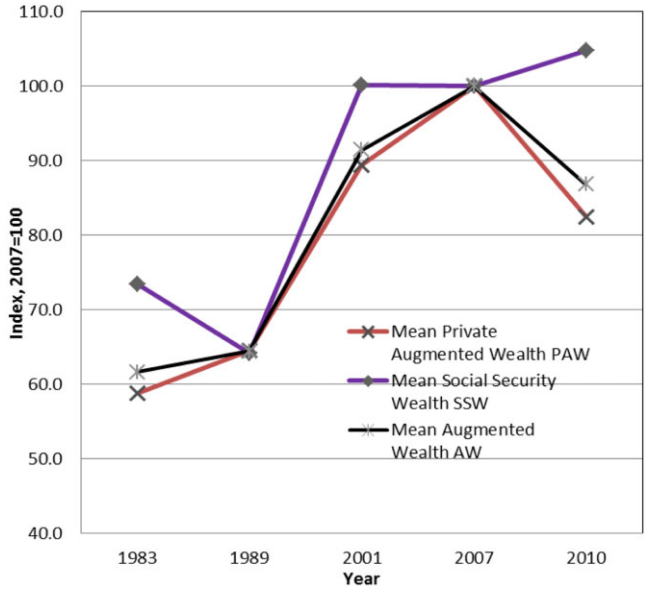

Figure 4. Trends in Augmented Wealth, Ages 47–64, 1983–2010 (Index, 2007 = 100)

percent and the median by 16 percent. If Social Security wealth SSW is now included to create AW, the mean grows by 48 percent and the median by 30 percent (also see Figure 4). The relatively slower growth in mean AW than mean PAW (and mean net worth) is due to the fact that mean SSW grew slower than mean net worth over these years. On the other hand, the higher growth in median AW than median PAW (and median net worth) reflects the fact that SSW is heavily concentrated in the middle of the wealth distribution.

Between 2001 and 2007, gains in mean AW slowed down, registering a 1.5 percent annual growth compared to a 2.2 percent annual increase in 1983–2001. Median AW advanced by only 2 percent (altogether), in comparison to a 30 percent rise in 1983–2001. It is also the case that median AW grew slower than mean AW—62 percent for mean AW from 1983 to 2007 and only 33 percent for median AW. Results are similar by sub-period.

Over the Great Recession, from 2007 to 2010, mean AW declined by 13 percent and median AW by 21 percent. These declines were less than those for net worth and PAW. These comparisons highlight the moderating influence of SSW on household wealth over the Great Recession when SSW continued to grow, albeit slowly, while net worth and pension wealth, particularly DB wealth, fell sharply.

We saw in the last section that adding DB wealth to net worth to create PAW resulted in a modest reduction in measured inequality. Here, it will become apparent that also including SSW results in a fairly sizeable decrease in measured inequality. In 2007 the Gini coefficient for net worth among all households was 0.795. Adding DB wealth to NW to obtain PAW results in a 0.037 decline of the Gini coefficient to 0.758 (see Table 2). This decrease is due to the relatively low

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inequality of DB wealth. Now, adding in SSW causes a much more sizeable reduction of 0.145 Gini points, from 0.795 for NW to 0.650 for AW. This drop in inequality reflects both the much lower level of inequality in SSW than in marketable wealth, as well as its relatively low (though positive) correlation with net worth. As a consequence, it is apparent that the main equalizing effect of retirement wealth comes from Social Security, not private pensions (as was found earlier in Wolff, 1987b).

While net worth inequality increased by 0.033 Gini points over years 1983 to 2007, that of AW climbed by 0.076. This is tantamount to saying that the equalizing effect of retirement wealth mitigated over the 1983–2007 period. While the addition of retirement wealth to net worth reduced the Gini coefficient by 0.187 points in 1983, the difference was only 0.145 in 2007.[15] The main reason for this was a rise in the inequality of retirement wealth itself over these years, primarily because of the rising share of DC pensions in total retirement wealth. A secondary reason was the increased correlation between non-pension wealth and retirement wealth. It is also of note that AW inequality increased slightly more over these years than that of PAW. The reason is evident from Panel D of Table 2, which shows that the share of SSW in AW fell over these years, from 23 to 19 percent.

The pattern changed dramatically from 2007 to 2010. In this case, while the Gini coefficient for net worth rose by 0.032 points, that for AW inched up by only 0.009 points. Moreover, the difference in Gini coefficients between NW and AW actually rose from 0.145 to 0.168. The reason for this change was both the rising share of SSW in AW, from 19 to 23 percent, and the declining share of NWX, from 60 to 56 percent (again, see Panel D of Table 2). As noted above, while PW declined from 2007 to 2010, SSW rose. Since SSW is much more equally distributed than NWX, its relative increase acted as a moderating influence on the increase in augmented wealth inequality over the Great Recession.

Figure 5 gives a graphical depiction of changes in the distribution of AW by period. Among middle-aged households, percentage changes in AW over the 1989–2001 period were all positive and formed a U-shaped pattern, bottoming out at the 30th percentile. This was a period when AW saw a moderate increase in inequality, reflecting the fact that percentage gains were somewhat more heavily concentrated in the upper 70 percent of the distribution. From 2001 to 2007, changes in AW were generally positive and small but the pattern was quite uneven. However, once again, positive gains were somewhat more heavily concentrated in the upper tail of the distribution, accounting for the moderate increase in AW inequality. In contrast, percentage changes in AW over the years 2007 to 2010 were uniformly negative (except the 85th percentile) and were largest in the middle of the distribution (the 20th to 75th percentiles), explaining the very small increase in AW inequality over these years.

[15]The use of a higher (lower) discount rate in the calculation of DB pension wealth would have lowered (raised) the value of DB pension wealth and consequently increased (decreased) the measured inequality of augmented wealth. Correspondingly, the use of a higher (lower) discount rate would have led to a lower (higher) increase in the Gini coefficient for augmented wealth between 1989 (or 1983) and 2007. A similar argument holds for the choice of the discount rate for the calculation of Social Security wealth.

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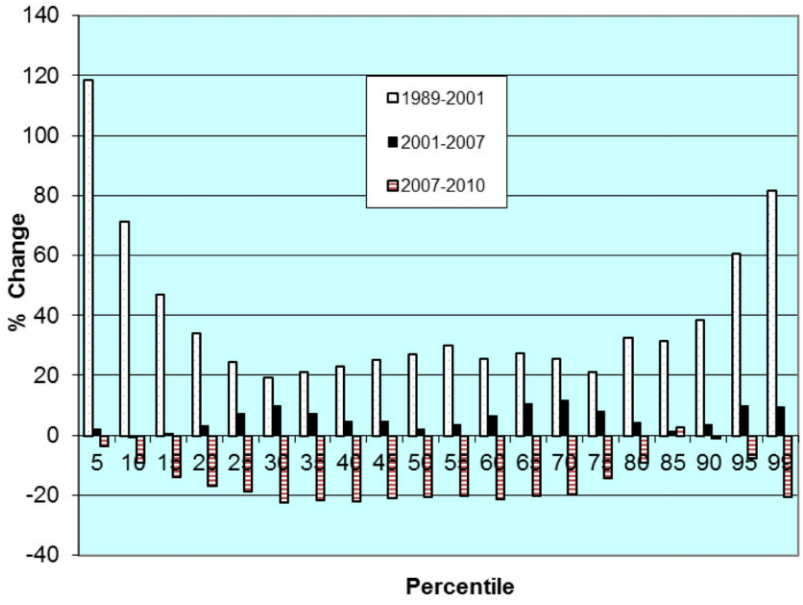

Figure 5. Percentage Change in Augmented Wealth (in 2010$) by AW Percentile and Period, Ages 47–64

8. Alternative Concepts of Retirement Wealth

As stressed in Section 3, there is no one "correct" concept of retirement wealth. In the tables and figures above, I have used the standard measure of both pension and Social Security wealth. In this section, I conduct sensitivity analysis by introducing four alternative concepts of retirement wealth to determine whether the basic results reported above still hold up, particularly for the years of the Great Recession.

8.1. *Employer Contributions to DC Pension Plans*

The first of these is to consider the contributions made by employers to DC plans. So far I have treated DC and DB pension wealth (as well as SSW) on a comparable footing. However, there is an important difference between DC wealth and the other two in their definition. In particular, I define DB wealth as the discounted future stream of DB pension benefits on the assumption that the employee remains at his or her firm of employment until the person's expected retirement date. The computation of SSW is also based on the assumption that the worker remains at work until the person's expected retirement date. On the other hand, the valuation of DC pension wealth is based solely on the current market value of DC plans. There is no added value in the calculation of DC wealth from the employee remaining at work (until the expected date of retirement).

To put DC wealth on a "comparable footing" with DB wealth, I add in to DC wealth a projection of the future stream of *employer* contributions to DC accounts

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like 401(k) plans until the expected year of retirement. Luckily, the SCF does provide information on employer contribution to DC plans. If we assume, as in the case of DB pensions, that workers remain at their company until retirement and that the terms of their DC contract with their employer stay the same, then it is possible to do this. In most cases, the employer contribution is a fixed percentage of the employee's salary. On the basis of the estimated human capital earnings functions and the "ongoing concern" assumption, it is possible to calculate the present value of the annual stream of future employer contributions to the DC plan until retirement (which I call DCEMP). Adding DCEMP to DC would then put DC wealth on a comparable footing to DB wealth, since both would reflect the available retirement wealth at time of retirement due to *employer* contributions to retirement plans.

Although with the addition of DCEMP to DC wealth, DC wealth now appears comparable to DB wealth, some differences still remain. In particular, there is greater risk associated with DC wealth. The benefit levels in DB plans are already set by the terms of the plans. DB wealth depends only on future labor force participation in the company and future earnings. The establishment of the Pension Benefit Guaranty Corporation in 1974 does, at least, insure the pension benefits (up to a fixed amount) in the event of the bankruptcy of a company. In comparison, DC wealth depends not only on future labor force participation and future earnings but also on future employee contributions, future employer contributions, and future rates of return. Indeed, the stock market experience of the 2000 to 2003 period and of the 2007 to 2009 period shows how difficult it would have been to project the future value of DC wealth even over these short periods. DB benefits are more certain than DC benefits. Indeed, the shifting of the risk from employer to employee is one of the reasons behind the rise of DC plans.

The SCF questionnaire indicates how many DC pension plans each spouse has (up to three per spouse). Information on the employer contribution to DC pensions plans is recorded in two ways. First, in some cases, the contribution is given as a flat dollar amount. Though it is not indicated in the survey data whether the dollar contribution is indexed to inflation over time, I assume that it is indexed to the CPI, which seems the more likely arrangement (if anything, this assumption will bias up the estimate). Let EMPAMT be the dollar amount of the employer contribution to the DC plan. Then, in this case, the present value of the stream of future employer contributions, $DCEMP_a$, is given by:

$$\text{(9a)} \qquad DCEMP_a = \int_0^{LR} EMPAMT(1-m_t)e^{-\delta^* t}dt.$$

The integration runs from the current year to LR, where RA is the expected age of retirement and LR = A – RA is the number of years to retirement.[16]

Second, in most cases, the employer contribution is given as a percent of earnings. If we assume that the proportion, EMPPER, is fixed over time, then in this case, $DCEMP_b$, is given by:

[16]It should be noted that past employer (and employee) contributions to DC plans are already included in the current market value of DC wealth.

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$$\text{DCEMP}_b = \int_0^{LR} \text{EMPPER} \cdot E_t^* (1 - m_t) e^{-\delta^* t} dt \tag{9b}$$

where E_t^* is the predicted earnings of the worker at time t in constant dollars.

The basic accounting framework can then be modified as follows:

$$\text{DCEMP} = \text{DCEMP}_a + \text{DCEMP}_b.$$

$$\text{DC}^* = \text{DC} + \text{DCEMP}.$$

$$\text{PW}^* = \text{DB} + \text{DC}^*. \tag{6′}$$

$$\text{PAW}^* = \text{NWX} + \text{PW}^*. \tag{7′}$$

$$\text{AW}^* = \text{NWX} + \text{PW}^* + \text{SSW}. \tag{8′}$$

Gains generally look stronger when DCEMP is included. In 2001, the average value of DCEMP among the age group 47–64 was $38,000 (in 2010 dollars), or 32 percent of DC. In 1989, the corresponding ratio was greater, at 66 percent. The higher ratio in 1989 reflects the lower accumulations of DC in that year compared to 2001 (the absolute value in DCEMP was much greater in 2001 than in 1989). In 2007, the mean value of DCEMP was $40,000, slightly larger than in 2001. The change from 2001 to 2007 reflects lower contributions to DC plans by employers and, for some firms, the termination of employer contributions. By 2007, the ratio of DCEMP to DC had fallen to 28 percent. Somewhat surprisingly, the ratio then jumped to 36 percent in 2010. Part of this change reflected the fall-off in DC wealth over this period from the stock market tumble but it also reflected a sizeable increase in mean DCEMP, from $40,000 to $52,000.

The addition of DCEMP augmented the mean value of PW by 17 percent in 2001. The corresponding figure in 1989 was 11 percent. The addition of DCEMP, not surprisingly, generally enhanced the growth of mean pension wealth between 1983 and 2001. Mean PW* increased by 147 percent over the 1983–2001 period, compared to a 113 percent gain in PW. The situation is different over the 2000s. In 2007, the inclusion of DCEMP enhanced the mean value of PW by 17 percent, exactly the same as in 2001. As a result, mean PW* gained 6.1 percent from 2001 to 2007, slightly lower than the growth of mean PW.

Evidence of the slowdown in the growth of augmented wealth is also evident for AW* (see Table 3 and Figure 6). Median AW* gained 37 percent from 1983 to 2001, compared to 30 percent for median AW, but only 2 percent from 2001 to 2007, about the same as median AW. From 2007 to 2010, median AW* plummeted by 21 percent, also about the same as median AW. It is also the case that median AW* grew slower than mean AW*—40 versus 68 percent from 1983 to 2007 and –21 versus –12 percent for 2007–10. Trends in inequality are also very similar between AW* and AW. The Gini coefficient for AW* climbed by 0.0726 from 1983 to 2007, compared to 0.0757 for AW—in both cases more than that of net worth. It then increased by 0.0140 from 2007 to 2010, compared to 0.0093 for AW, but in both cases less than that of net worth.

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TABLE 3

Time Trends in Alternative Measures of Augmented Wealth, Age Group 47–64, 1983–2010

	1983	1989	2001	2007	2010
A. Time Trends: Means (1000s, 2010 dollars)					
1. Net worth (NW)	459.4	501.6	736.7	844.7	707.0
2. Augmented wealth AW	719.7	752.6	1067.8	1167.7	1013.5
3. Augmented wealth AW*	720.2	766.2	1105.7	1207.4	1065.7
4. Augmented wealth AW**	–	780.9	1117.4	1230.7	1140.7
5. Projected augmented wealth AWP	–	947.4	1187.0	1284.9	1251.4
6. Accrued augmented wealth AWACC				969.0	847.3
B. Time Trends: Medians (1000s, 2010 dollars)					
1. Net worth (NW)	133.4	164.0	169.4	217.2	128.8
2. Augmented wealth AW	383.5	392.5	500.0	510.5	405.3
3. Augmented wealth AW*	384.4	394.1	526.1	537.1	424.8
4. Augmented wealth AW**	–	400.6	534.3	550.9	458.5
5. Projected augmented wealth AWP	–	456.0	554.0	569.0	479.6
6. Accrued augmented wealth AWACC				391.1	341.4
C. Gini Coefficients					
1. Net worth (NW)	0.761	0.775	0.798	0.795	0.827
2. Augmented wealth AW	0.574	0.619	0.637	0.650	0.659
3. Augmented wealth AW*	0.574	0.618	0.633	0.647	0.661
4. Augmented wealth AW**	–	0.617	0.632	0.643	0.659
5. Projected augmented wealth AWP	–	0.644	0.640	0.648	0.672
6. Accrued augmented wealth AWACC	–	–	–	0.668	0.665

Notes: Households are classified into age groups by the age of the head of household.

Augmented Wealth AW = NWX + PW + SSW.

Augmented Wealth AW* = NWX + PW* + SSW.

Augmented Wealth AW** = NWX + PW** + SSW.

Augmented Wealth AWP = NWP + DB + SSW, where NWP is projected net worth at year of retirement in 2010 dollars.

Augmented Wealth AWACC = NW + DBACC + SSWACC.

Source: Own computations from the 1983, 1989, 2001, 2007, and 2010 SCF.

8.2. *Employee Contributions to DC Pension Plans*

I next include the present discounted value of future *employee* contributions into DC plans, a component which I call DCEMPW. The inclusion of this variable is a logical extension of the addition of DCEMP. In fact, for the vast majority of firms, the provision of an employer contribution to a DC plan is *contingent* on payments made by an employee into a company-sponsored pension plan.

The computation of DCEMPW, like DCEMP, is based on data provided in the SCF, which indicates what fraction of the employee's salary is currently contributed into the employee's DC account. As with DCEMP, it is assumed that the worker continues to work for the same employer until retirement and that the contribution rate remains unchanged over time. DCEMPW is defined in exactly analogous fashion to DCEMP except that in equation (9a), the term EMPAMT is replaced by EMPAMTW, which is the dollar amount of the *employee* contribution to the DC plan, which is assumed to remain fixed in real terms over time; and in equation (9b), the term EMPPER is replaced by EMPPERW, which is the *employee* contribution to the DC plan as a percent of earnings, which is assumed to be fixed over time.

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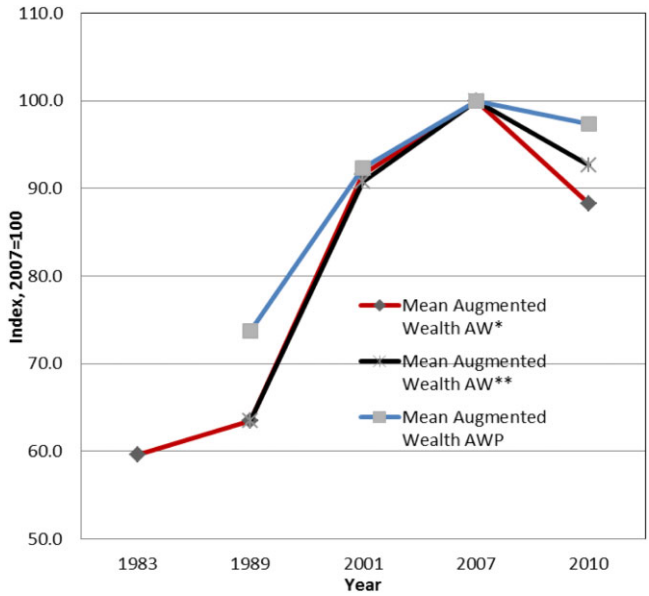

Figure 6. Trends in Alternative Measures, Ages 47–64, 1983–2010 (Index, 2007 = 100)

The new accounting framework becomes:

$$DC^{**} = DC + DCEMP + DCEMPW.$$

(6″) $$PW^{**} = DB + DC^{**}.$$

(7″) $$PAW^{**} = NWX + PW^{**}.$$

(8″) $$AW^{**} = NWX + PW^{**} + SSW.$$

DCEMPW is of the same order of magnitude as DCEMP—almost exactly the same in 1989, somewhat lower in 2001 and 2007, and somewhat higher in 2010. There was also a sizeable increase in mean DCEMPW, as there was in DCEMP, from 2007 to 2010. In this case the mean value increased from $23,000 to $75,000. The likely reason is that workers were trying to make up for the lost value in their DC balances, which resulted from the stock market decline over those years. As a result, PW** grew somewhat faster than PW* from 1989 to 2007 (114 versus 96 percent) and actually gained 13 percent from 2007 to 2010 while PW* lost 3 percent.[17]

However, the time trend for augmented wealth AW** is almost the same as those for AW and AW* (see Table 3 and Figure 6). Mean AW** advanced by 43 percent from 1989 to 2001, almost exactly the same as mean AW and mean AW*;

[17]Because of a large number of missing values, it is not possible to show results for DCEMW or PW** for 1983.

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mean AW** then grew by 10 percent from 2001 to 2007, also almost exactly the same as mean AW and mean AW*; and mean AW** declined by 7 percent from 2007 to 2010, somewhat less than the 12 percent decrease in mean AW* and the 13 percent reduction in mean AW. Median AW** gained 33 percent from 1989 to 2001, compared to 34 percent for mean AW* and 27 percent for mean AW, but only 3 percent from 2001 to 2007, about the same as median AW* and median AW. From 2007 to 2010, median AW** fell by 17 percent, compared to 21 percent for median AW and median AW*. In particular, median AW**, like median AW and median AW*, declined less in percentage terms than net worth. Trends in inequality are also very similar between AW** and both AW* and AW (in fact, the Gini coefficients are almost exactly the same for AW** and AW*). Of note is the fact that once again, the inequality of AW**, like that of AW and AW*, increased more from 1989 to 2007 than that of net worth and rose less than that of net worth from 2007 to 2010.

8.3. *Projected Wealth at Retirement*

The third concept is based on a projection of total household wealth to the year of retirement (in most cases, age 65). Both DB wealth and Social Security wealth SSW show wealth at retirement on the basis of these two sources. The variables DCEMP and DCEMPW show the discounted value of projected employer and employee contributions to DC plan from current age to age of retirement. At first glance, the sensible procedure might be to project non-pension wealth NWX to year of retirement and add that to DB, SSW, DCEMP, and DCEMPW.

However, the problem with this procedure is that there is likely to be substitution between DC contributions and savings in non-pension wealth (see Section 2 above for the pertinent literature review). Employees who contribute to a DC plan are likely to save less in other forms of wealth, *ceteris paribus*, than workers who do not contribute. Moreover, if the employer also makes a contribution to a DC plan, other savings might be reduced even more. It is not possible to accurately estimate the elasticity of substitution between DC wealth and other forms of wealth. As a result, it is not feasible to independently project non-pension wealth NWX to age of retirement.

Another possibility is to project household net worth on the basis of the household's portfolio composition and historical rates of return by asset type. The problem with this approach is that while it is feasible to project future capital gains on this basis, it is very hard to project future savings rates.[18] Therefore, this approach will give only a partial answer to estimating future net worth.

My method is therefore a straightforward projection of net worth (NW, including DC, DCEMP, and DCEMPW) based on historical changes in the net worth of the age group 47–64. Moreover, these computations are made for seven income classes (results are very similar using wealth classes as well). For example, using data from the SCF for the age group 47–64 over the period from 1983 to 2007, I calculate an annual average real growth rate of 2.54 percent for net worth

[18]This process would require a household micro-simulation model such as the MINT model that the Urban Institute and the Social Security Administration use (see, e.g., Smith *et al.*, 2001).

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for this age group. This approach also avoids the difficulty of determining whether DC contributions add to net savings over time or not.

In the projection, I use the actual growth rates by income class for each of four periods: 1983–89, 1989–2001, 2001–07, and 2007–10. As discussed above, mean net worth declined by 16 percent during the last of these periods. It is likely that this was an anomaly to the long term growth of net worth, which resulted from the severity of the recession over those years. As a result, I use the 1983–2007 average annual growth rate for NW to project net worth after year 2010.

Results in Table 3 are shown for projected augmented wealth (AWP), where

$$\text{AWP} = \text{NWP} + \text{DB} + \text{SSW} + \text{DCEMP} + \text{DCEMPW} \tag{10}$$

and NWP equals projected net worth at year of retirement (also see Figure 6).[19] It is first of interest to note that the percentage difference between mean AWP and mean AW** is quite small in 2001, 2007, and 2010—varying from 4 to 10 percent. These modest differences reflect the fact that a large proportion of middle-aged households are close to retirement, so their current net worth is close to what it would be at retirement. However, the difference is much larger in 1989—21 percent. This reflects the fact that the average growth in net worth for this age group was 3.2 percent per year from 1989 to 2001, much higher than in subsequent periods.

As a consequence, AWP grew slower than AW** from 1989 to 2007. While mean AW** increased by 58 percent, AWP grew by only 36 percent, and while median AW** rose by 38 percent, median AWP gained only 35 percent. The Gini coefficients for AWP are higher than those for AW**, especially for 1989, reflecting the faster growth in NW for higher income households. As a result, whereas the Gini coefficient for AW** rose by 0.0264 points from 1989 to 2007, that for AWP increased by only 0.0037. Likewise, while the Gini coefficient for AW** advanced by 0.0162 points from 2007 to 2010, that for AWP rose by 0.0241. However, for both AW** and AWP, the rise in the Gini coefficient was less than that of net worth (0.0324 points).

8.4. *The Accrual Value of Retirement Wealth*

The fourth alternative measure of retirement wealth is based on the so-called accrual value of defined benefit DB and Social Security wealth. This shows the value of each plan based on the individual's work history *to date.* In the case of DB wealth, the value is based on the answer to the following question in the SCF questionnaire: "If you left this job now, what would you be eligible to receive from this plan—a lump sum distribution or settlement to keep or roll over or would you receive regular payments now or later . . . ?" Let us call this value EPWACC. Then the computation of the accrual value of DB wealth is exactly the same as in equation (2) except that the term EPWACC replaces the term EPB. The total accrual value of DB pension wealth, DBACC, is then the sum of the present value of future accrual DB benefits from current jobs plus the present value of future DB benefits from previous jobs, including DB benefits currently being received.

[19]AWP cannot be computed for 1983 because DCEMPW is not available for this year.

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In the case of the latter, the accrual value is based on the individual's AIME computed on the basis of the individual's work history *to date* and the corresponding value of PIA. Let us call this value PIAACC. Then the computation of the accrual value of Social Security wealth, SSWACC, is exactly the same as in equation (4) except that the term PIAACC replaces the term PIA.[20] DBACC and SSWACC thus put retirement wealth on an equal footing with net worth, since all three are valued as of the current date. This is similar to the relation among NWP and DB and SSW, which in this case are all valued as of the date of retirement.

The accounting framework is then modified as follows:

$$\text{AWACC} = \text{NW} + \text{DBACC} + \text{SSWACC} \tag{11}$$

Time trends for AWACC are remarkably similar to those for AW, at least over the years 2007 to 2010 (see Table 3). Both mean AW and mean AWACC fell by 13 percent from 2007 to 2010. Likewise, whereas median AW dropped by 21 percent, median AWACC went down by 13 percent. In both cases, the median fell far less than median net worth. With regard to inequality trends, it is first of note that the Gini coefficient for AWACC is higher than that for AW. The difference reflects the lower weight of DB wealth, which tends to be equalizing, in AWACC than in AW. Moreover, whereas the Gini coefficient for AW increased slightly between 2007 and 2010, that for AWACC remained relatively unchanged. However, in both cases, the Gini coefficient rose substantially less than that for net worth.

9. Conclusion

The picture that unfolded over the almost three decades from 1983 to 2010 revolves around the four components of augmented wealth: (i) non-pension wealth (NWX), (ii) traditional defined benefit pension wealth (DB), (iii) defined contribution pension wealth (DC), and (iv) Social Security wealth (SSW). DB and SSW play the role of "equalizers," reducing inequality and pulling up the median. In contrast, NWX and DC are the "disequalizers," increasing inequality and lowering the median. As DB plans fell off and were replaced by DC plans, the growth of median wealth slowed and wealth inequality rose. Social Security wealth was a stable presence throughout these years but grew in relative terms during the Great Recession, helping to moderate the precipitous decline in median wealth and the sharp rise in wealth inequality.

These years, as discussed above, witnessed the transformation of the traditional DB pension system in favor of DC pension coverage. The share of households in the age group 47–64 covered by a DB plan fell from 69 to 30 percent, and mean DB pension wealth plunged by 27 percent. In contrast, the share with a DC plan climbed from 12 to 60 percent and average DC pension wealth increased 14-fold. Mean pension wealth more than doubled in real terms, though the

[20]Calculations could be performed for years 2007 and 2010 only because of the lack of comparable information for earlier years.

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share of households covered by either a DB or a DC pension plan remained at about 70 percent.

By conventional wealth measures, the period from 1983 to 2007 was one of robust growth, with mean net worth surging by 84 percent among middle-aged households. However, when we add in DB pension wealth to create private augmented wealth, the sum of NWX and DB wealth—an intermediate measure which enables us to isolate the effect of DB wealth—the gains are a bit more modest, with mean PAW advancing by 70 percent. Mean Social Security wealth grew at a slower rate, 36 percent over the period, and, all told, mean augmented wealth grew by 62 percent.

The story is not quite as robust when we look at trends in median values. Median net worth advanced by 63 percent, compared to a 84 percent gain in mean net worth. Likewise, median PAW was up by 32 percent (compared to 70 percent for the mean value) and median AW rose by 33 percent (compared to 62 percent for the mean value). The difference in trends between mean and median PAW and between mean and median AW reflects the relative decline in DB wealth and the corresponding relative increase in DC wealth. Moreover, both median PAW and median AW increased only about half as much as median net worth, again reflecting the sharp decline in DB wealth.

Even these relatively healthy trends over the years 1983 to 2007 hide important differences by sub-period. Indeed, one of the key findings of this paper is that there was a marked slowdown in the growth of pension wealth, PAW, and augmented wealth in the 2001–07 period, compared to the 1980s and 1990s. Indeed, the DC pension system looked very successful in the 1980s and 1990s, while the stock market was booming, but then fell flat from 2001 to 2007 even before the financial meltdown. Among middle-aged households, in particular, the annual growth rate of average pension wealth fell by more than three-quarters from 4.2 percent over the 1983–2001 period to 1.0 percent over the 2001–07 period.

Mean net worth among middle-aged households grew at about the same rate from 2001 to 2007 as it did from 1983 to 2001, while median net worth grew much faster. However, Social Security wealth advanced at a slower pace. As a result, the annual growth rate of mean AW fell off from 2.9 percent over the 1983–2001 period to 2.5 percent over the 2001–07 period, while that of median augmented wealth showed an even steeper decline from 2.0 to 0.35 percent per year. The slow growth in median AW from 2001 to 2007 once again reflects the relative decline in DB wealth and corresponding rise in DC wealth.

The years of the Great Recession, 2007 to 2010, saw a 10 percent decrease in mean pension wealth, a 16 percent decline in mean net worth, and a staggering 41 percent decline in median net worth. Mean and median PAW each declined about the same degree as net worth. However, median augmented wealth was down by "only" 21 percent because of the relative increase in Social Security wealth over these years and its concentration in the middle of the wealth distribution. Considering the whole decade from 2001 to 2010, I find that mean pension wealth was down by 4.5 percent, mean net worth by 4.0 percent, and median net worth by 24 percent. Mean augmented wealth declined by 5.1 percent and median AW by 19 percent. All in all, the decade of the 2000s (from 2001 to 2010) appears to have been a "lost decade" in terms of pension wealth, net worth, and augmented wealth.

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Results also show that the equalizing effects of retirement wealth lessened from 1983 to 2007. Net worth inequality among middle-aged households showed an increase of 0.033 points from 1983 to 2007. Retirement wealth did have a marked effect on inequality. Adding retirement wealth to net worth substantially lowered the Gini coefficient (from 0.795 to 0.650 in 2007, for example). Most of the equalizing effect came from the addition of Social Security wealth. However, from 1983 to 2007, while the Gini coefficient for net worth rose by 0.033 points, that for augmented wealth climbed by 0.076. In other words, the addition of retirement wealth to net worth reduced the overall Gini coefficient by 0.187 in 1983 but by only 0.145 in 2007. The reason for this is the relative decline of DB wealth, which dropped from 13 to 8 percent of augmented wealth and the corresponding rise of DC wealth, from 1.4 to 12 percent. In fact, the Gini coefficient for PAW increased by 0.070 points, almost the same as that for augmented wealth.

In contrast, from 2007 to 2010, while the Gini coefficient for net worth jumped by 0.032, that for AW went up by only 0.009 points. The explanation for this is both the rising share of Social Security wealth in augmented wealth, from 19 to 23 percent, and the declining share of non-pension wealth NWX, from 60 to 56 percent. Since Social Security wealth has much lower inequality than NWX, its relative increase acted as a moderating influence on the increase in net worth inequality over these years.

Sensitivity analysis was conducted using four alternative concepts of augmented wealth. In the first, AW*, the present value of the annual stream of future employer contributions to DC plans (DCEMP) is added to pension wealth PW to create PW*. In the second, AW**, the present discounted value of future *employee* contributions into DC plans (DCEMPW) is added to PW* to produce PW**. In the third, AWP, net worth is projected to year of retirement. In the fourth, AWACC, the accrual value of DB pension wealth and Social Security wealth is used in place of DB and SSW. The main results of the analysis generally hold up with these alternative concepts. In particular, the growth in mean pension wealth slowed down in the years 2001 to 2007 compared to the years 1983 to 2001 and then showed an absolute decline from 2007 to 2010. The growth in mean and median augmented wealth also slowed down in 2001–07 compared to 1983–2001 and showed an absolute decline from 2007 to 2010. Median augmented wealth grew more slowly than median net worth from 1983 to 2007. Then, from 2007 to 2010, median augmented wealth showed a smaller percentage decline than that of net worth. Finally, the Gini coefficient for augmented wealth showed a larger increase from 1983 to 2007 than that for net worth but a smaller increase from 2007 to 2010.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix: Estimation of Pension and Social Security Wealth

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