

HOW HAS SHIFT TO DEFINED CONTRIBUTION PLANS AFFECTED SAVING?

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Introduction

Many commentators – ourselves included – assert that people are saving less for retirement as a result of the shift from defined benefit to defined contribution plans. To support such an assertion, it would be nice to have counterfactual data showing what the world would look like today in terms of retirement saving if workers were still covered by defined benefit plans and compare that saving with actual contributions to defined contribution plans. But these data do not exist. Furthermore, even if these data did exist, today's more mobile workforce would make defined benefit plans a less effective way to save than they were in the past. So such an exercise simply is not feasible.

Interestingly, it is possible to get some idea about what is going on by looking at the National Income and Product Accounts (NIPAs). These data used to show annual contributions to both defined benefit and defined contribution plans. Contributions to defined benefit plans, however, provided little information about pension saving because, when the stock market booms, employers' contributions can drop to zero as they rely on investment returns to fund accruing benefits. In 2013, the government changed accounting for defined benefit plans from a cash basis to an accrual basis. That is, instead of reporting how much an employer contributes to a defined benefit

plan, the NIPAs now report how much participants in a plan are accruing in benefits. This *brief* uses these new data to provide some insight on how pension saving has changed over time.

The discussion proceeds as follows. The first section describes the new NIPA data and how they allow for a more direct comparison of pension saving between defined benefit plans and defined contribution plans. The second section focuses on defined benefit accruals and makes some adjustments to standardize for interest rates over time and to reflect the fact that the benefits are based on final earnings. The third section turns to the defined contribution data to better understand the pattern over time. The final section puts the two sides together.¹

The conclusion is that after various adjustments, the percentage of salary going towards retirement saving has declined slightly. On the other hand, if returns on accumulations are included, the annual change in pension wealth appears to have remained relatively steady. In short, the NIPA data suggest that people are not accumulating less as the result of the shift from defined benefit to defined contribution plans. What has changed is not the amount of saving going on, but rather who is bearing the risk.

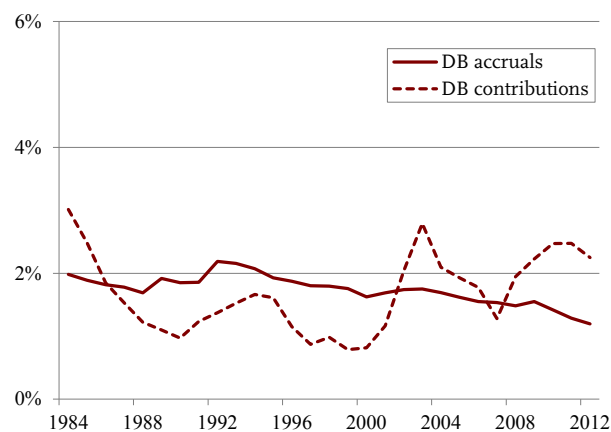
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The New NIPA Data

A defined benefit pension is an employer retirement plan that promises employees lifelong monthly retirement benefits based on years of service and final salary. Historically, the NIPAs measured the income that households received from this source during a working year by reporting actual employer contributions to the plan.² That is, household income and saving attributable to defined benefit plans reflected a “cash-based” measure. In 2008, the NIPA framework moved away from cash flows and toward a measure of accrued benefits. Specifically, the contribution to household income was set equal to the change in the net present value of future benefits.

The NIPAs introduced the new methodology in 2013 and made conforming numbers available retroactively. As shown in Figure 1, the NIPA accruals follow a much smoother path than contributions, which tend to vary widely over time in response to market swings. More importantly, defined benefit accruals are conceptually similar to contributions to a defined contribution plan. This comparability makes it possible to see what has happened to total pension saving over time.

FIGURE 1. NIPA DEFINED BENEFIT (DB) ACCRUALS AND CONTRIBUTIONS AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES, 1984-2012



Sources: Authors' calculations from the U.S. Department of Commerce, *National Income and Product Accounts Tables* (NIPAs), 1984-2012.

A Closer Look at the Defined Benefit Numbers

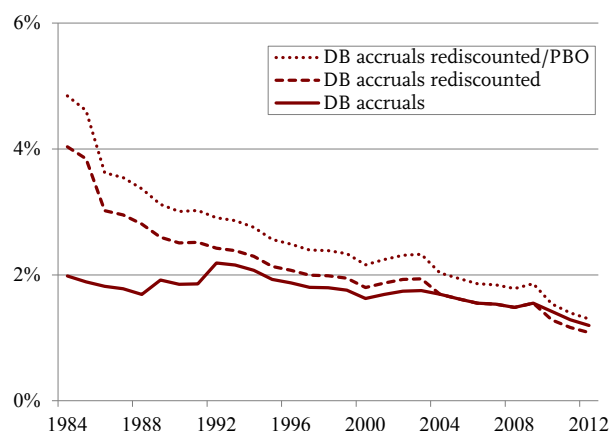
While the calculations of defined benefit accruals are carefully done by NIPA analysts and are consistent with the national account structure, the pattern in Figure 1 does not square with what we know about the evolution of these plans in the private sector.³ In the early 1980s, most private sector workers covered by an employer-sponsored plan had a defined benefit plan; by 2013 the share relying solely on a defined benefit plan had declined to less than 20 percent.⁴ Yet, Figure 1 suggests only a slight decline in accruals across the three decades. A couple of factors may help explain what is going on.

One issue is interest rates. As noted, accruals are the change in the net present value of future benefits, so the rate used to discount future benefits is very important. Rates were very high in the 1980s and are now very low, which means that the same pension plan would show very low levels of accrual in the 1980s and much higher levels now. The NIPA analysts make some adjustment for this problem. Using the AAA corporate rate, they adopt four decision criteria that dampen fluctuations.⁵ We take the dampening one step further and assume a constant discount rate of 5.5 percent, the average AAA corporate rate for 2000-2012.⁶ Making this adjustment shows a steeper decline in defined benefit accruals, as shown by comparing the middle line in Figure 2 on the next page with the published NIPA measure.

A second issue is the measure of benefits that is used. The NIPAs use the accumulated benefit obligation (ABO), which represents the present value of benefits due to participants if the plan were to terminate. Although sponsors are not required to give plan participants future opportunities to accrue benefits, the ABO provides a lower bound on pension accruals. In the private sector, the Financial Accounting Standards Board requires plans to report their expense and funded ratios using the projected benefit obligation (PBO). The PBO includes not only benefits earned to date but also *the effect of future salary increases on the value of pension rights already earned by active workers*. We think the PBO is a better measure for our purposes, especially in the earlier years when workers had longer tenures, and adjust accordingly; see the top line in Figure 2 (on the next page).⁷

While both the interest rate and benefit adjustments require a judgement call, they seem to result in a more intuitive picture of how much workers were putting aside for retirement through their defined benefit plans. Now let's look at retirement saving through defined contribution plans.

FIGURE 2. DEFINED BENEFIT (DB) ACCRUALS AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES BY TYPE OF ACCRUAL MEASURE, 1984-2012



Note: See endnote 8.

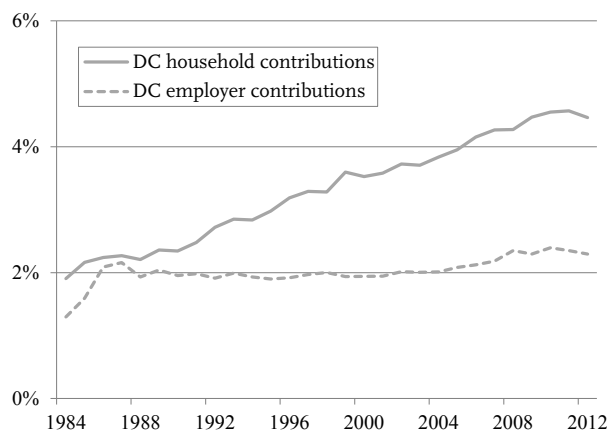
Sources: Authors' calculations from NIPAs (1984-2012); and Gold and Latter (2009).

A Closer Look at the Defined Contribution Numbers

Figure 3 shows household and employer contributions to defined contribution plans as a percentage of private sector wages and salaries. The NIPA numbers raise two issues. The first is the flat pattern of employer contributions in the face of the explosive growth of 401(k) plans. The second is that the household contributions measure consists of more than employee contributions. Let's take these issues one at a time.

The flat employer-contribution pattern seems surprising given that 401(k) plans began to spread rapidly in 1981. Although the NIPAs do not separate 401(k) activity from that of other defined contribution plans, the Department of Labor provides data on 401(k) plans from Form 5500 back to 1989.⁹ We

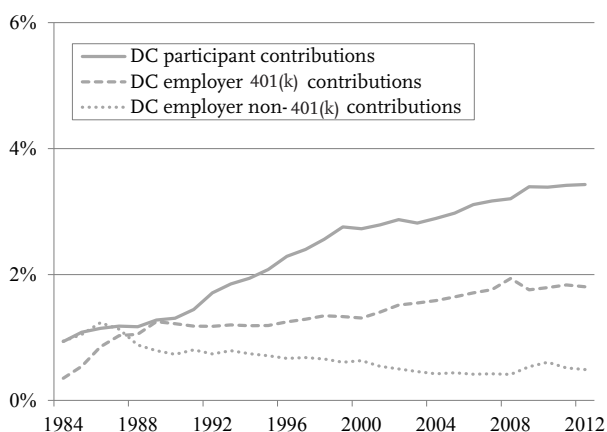
FIGURE 3. NIPA DEFINED CONTRIBUTION (DC) PLAN CONTRIBUTIONS AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES, 1984-2012



Source: Authors' calculations from NIPAs (1984-2012).

used these data and the fact that 401(k) contributions only began in 1981¹⁰ to estimate the 401(k) contribution component of the NIPA employer contributions back to 1984.¹¹ This exercise shows that employer contributions are steady, because, while contributions to 401(k) plans increased, contributions to non-401(k) defined contribution plans declined (see the bottom two lines in Figure 4).

FIGURE 4. DC PLAN CONTRIBUTIONS AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES BY TYPE, 1984-2012

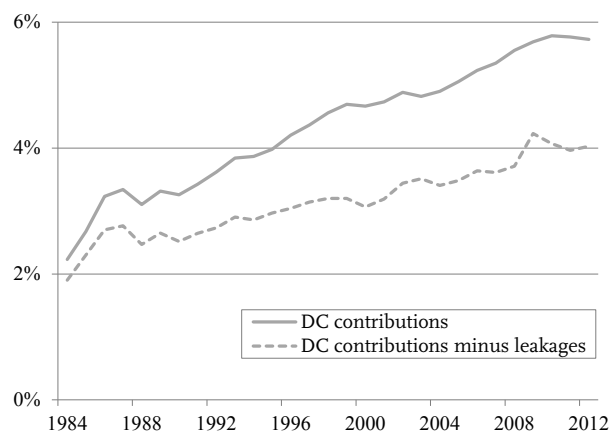


Sources: Authors' calculations from NIPAs (1984-2012); and U.S. Dept. of Labor, *Abstracts of Form 5500 Annual Reports* (1989-2012).

The second issue is that the NIPAs report household contributions. These data come from the Form 5500 and include rollovers in addition to participant contributions. Since the rollovers overstate the amount contributed, we replaced NIPA's household figure with Form 5500 participant contributions for 1989-2012. Then we used a variety of information to back-cast to 1984 (see the top line in Figure 4).

Adding up the three lines in Figure 4 provides a measure of total contributions to defined contribution plans (see the top line in Figure 5). The next step is to consider any adjustments that might be required before comparing defined contribution savings with that in defined benefit plans. One obvious issue is the question of pre-retirement withdrawals, or leakages. A recent study concluded that at least 1.5 percent of assets leak out of defined contribution plans each year.¹² Subtracting that amount from gross contributions yields net annual saving in defined contribution plans (the bottom line in Figure 5).

FIGURE 5. PARTICIPANT AND EMPLOYER DC PLAN CONTRIBUTIONS AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES WITH AND WITHOUT LEAKAGES, 1984-2012



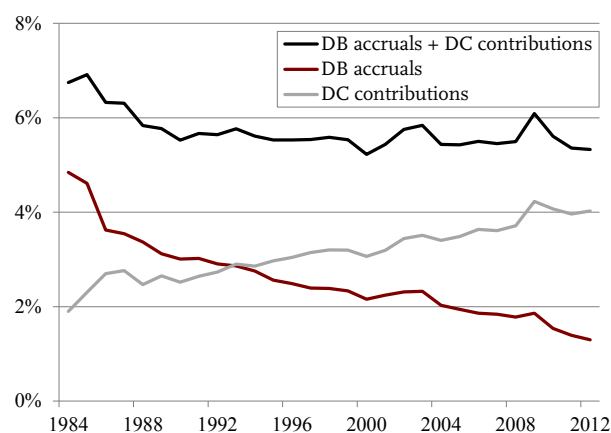
Sources: Authors' calculations from NIPAs (1984-2012); Form 5500 (1989-2012); U.S. Board of Governors of the Federal Reserve System, *Flow of Funds* (2014) and *Survey of Consumer Finances* (SCF) (1989-2013); and Munnell and Webb (2015).

Comparing Saving through DB and DC Plans

Figure 6 shows our estimated activity in defined benefit and defined contribution plans for 1984-2012. Defined benefit plan accruals decline sharply, and defined contribution plan contributions rise commensurately as 401(k) plans spread. The top line com-

bins these data to show the total amount of saving in private sector employer-sponsored plans. On balance, the decline in defined benefit plan accruals has not been fully offset by rising contributions to defined contribution plans, leading to a slight overall decline in retirement saving.

FIGURE 6. ANNUAL DB ACCRUALS AND DC PLAN CONTRIBUTIONS AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES, 1984-2012

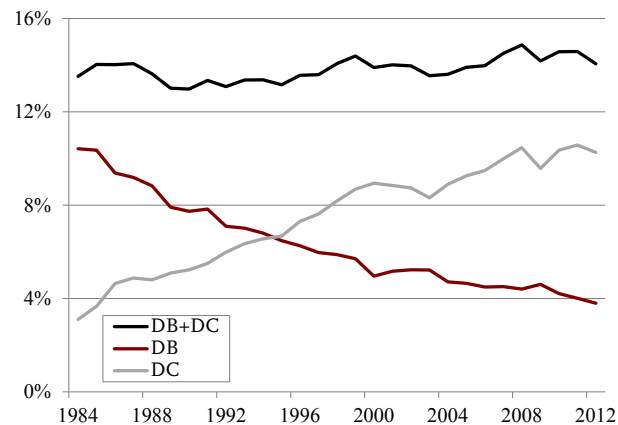


Sources: Authors' calculations from NIPAs (1984-2012); Form 5500 (1989-2012); *Flow of Funds* (2014); and SCF (1989-2013).

Contributions, however, do not tell the whole story. Pension wealth also goes up by the return on accumulations. Calculating the return on accumulations involves two steps. Our focus is on current workers, so the first step is to determine the share of defined contribution assets and defined benefit accumulated accruals attributable to them.¹³ The second step is to apply a rate of return to the accumulations. We assumed 5.5 percent for both types of plans and applied that rate to accrued liabilities in defined benefit plans and to reported assets in defined contribution plans.

The results show that, when returns on accumulations are added to contributions, the annual change in pension wealth appears to have been relatively steady over time (see Figure 7 on the next page). This pattern, which contrasts with the decline in pension contributions shown in Figure 6, reflects the large defined contribution accumulations as a result of the prolonged bull stock market during the 1990s and the strong rebound since the financial crisis. Individuals covered by 401(k) plans have taken more risks than participants in defined benefit plans, and the high returns associated with risky investments have produced substantial asset accumulation.

FIGURE 7. ANNUAL CHANGE IN DB AND DC PENSION WEALTH AS A PERCENTAGE OF PRIVATE WAGES AND SALARIES, 1984-2012



Sources: Authors' calculations from NIPAs (1984-2012); Form 5500 (1989-2012); *Flow of Funds* (2014); and SCF (1989-2013).

The importance of asset performance underscores the fact that the type of retirement wealth that workers hold has changed significantly. In defined benefit plans, the employer guarantees a fixed amount of

final earnings for life. That is, the employer bears the investment and mortality risks. In contrast, in defined contribution plans, the employee bears the investment risk and must figure out how to make accumulated assets last for a lifetime. So while the aggregate data suggest that accumulations have not declined, the pattern of outcomes among individuals may have changed substantially.

Conclusion

The introduction of defined benefit plan accrual data in the National Income and Product Accounts offers an opportunity to explore the patterns of retirement saving in defined benefit and defined contribution plans over the last 30 years. Our reading of the data, after our adjustments, is that the accumulation of retirement assets has not declined as a result of the shift from defined benefit to defined contribution plans. We are going to have to change our story! Of course, the nature of the accumulation process and the distribution of risks have shifted dramatically. The effect of these shifts, however, can be identified only by looking at data on individuals as opposed to those from our national accounts.

Endnotes

- 1 Because others may prefer to make different adjustments, our data are available to interested parties for additional analysis.
- 2 United Nations Statistical Commission (1993).
- 3 See Rassier (2014).
- 4 Munnell (2014).
- 5 First, the NIPA analysts adopt a target range of 5-7 percent for all long-term trends, because the average AAA corporate bond yield from 1929-2008 is 6.0 percent, the average discount rate used by the Pension Benefit Guaranty Corporation (PBGC) from 1979-2008 is 6.8 percent, and the median discount rate reported by plans on Form 5500 is approximately 6.0 percent from 2000 to 2009. Second, they do not let the rate change more than once in a consecutive three-year period. Third, they adopt a top rate of 9.5 percent based on PBGC's published rates for the early 1980s, because the high bond rates in the 1980s were not sustainable. Fourth, they generally do not let the discount rate change more than 1 percentage point from one year to the next.
- 6 We then adjust the NIPA accrual numbers by applying a rule of thumb commonly used by actuaries, assuming a 22.5-percent change in accruals for each 1-percentage-point change in the interest rate. This adjustment is based on the premise that a 1-percentage-point change in the interest rate tends to yield a 20-25 percent change in normal cost.
- 7 To adjust our data from an ABO actuarial method to a PBO method, we multiplied NIPA defined benefit accruals by 20 percent. This adjustment is based on Gold and Latter (2009), assuming that the average worker is age 45.
- 8 Values are rediscounted using a 5.5-percent adjustment to the NIPA discount rates, and by assuming that DB accruals grow by 22.5-percent for every 1-percentage-point increase in the discount rate. Also, DB accruals are increased by 20 percent to adjust to a PBO estimation.
- 9 Form 5500 provides data on 401(k) employer contributions for plans with 100 or more participants. To include plans containing fewer than 100 participants, a ratio was calculated using Form 5500's 401(k) employer contributions divided by total private employer DC contributions.
- 10 As referenced by Munnell and Sundén (2004), the Revenue Act of 1978 included provisions that allowed explicit salary reduction, a key feature of 401(k) plans, but only after the Internal Revenue Service issued clarifying regulations in 1981 did the 401(k) become popular.
- 11 We then took the ratio of 401(k) to total contributions from Form 5500 and applied that ratio to the NIPA total employer contributions to get estimated NIPA 401(k) contributions. We then subtracted these 401(k) estimated contributions from total NIPA contributions to get employer contributions to non-401(k) defined contribution plans. We then extended these back to 1984.
- 12 The 1.5 percent, as referenced by Munnell and Webb (2015), was applied to defined contribution and Individual Retirement Account (IRA) assets reported in the Federal Reserve's *Flow of Funds*. IRA assets for current workers are important to include, because most of the money in IRAs represents rollovers from defined contribution accounts. The *Survey of Consumer Finances* estimates that individuals age 65 or older accounted for 24.1 percent to 50.9 percent of IRA assets from 1989-2013. Therefore, in order to separate the assets of active workers and retirees, we excluded the IRA assets of those age 65 or older from this adjustment.
- 13 As in the case of leakages, it is necessary to consider IRAs on the defined contribution side because most of the money in IRAs comes from defined contribution plan rollovers. Our assumption is that all 401(k) assets belong to current workers, but only the portion of IRA assets held by those under age 65 are included.
On the defined benefit side, Form 5500 reports the percentage of accumulated liability for active workers. This percentage was applied to defined benefit liabilities adjusted to a PBO measure and a constant interest rate.

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