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Challenges and approaches to the implementation of 2008 SNA

Changes in the measurement of pensions in the US national income and product accounts

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Summary

The System of National Accounts 2008 recognizes that pension entitlements derived from employment-related defined benefit plans are contractual agreements that should be treated as liabilities of the sponsors and assets of households, regardless of whether the pension plan is fully funded. It recommends that the employer's contribution should be based on accrual principles, calculated as the increase in the net present value of the pension entitlement earned through service to the employer in the period, after accounting for costs of operating the pension and for any contribution made by the employee, and that explicit liabilities should be recorded. In 2013, this accrual-based approach was implemented in the US national income and product accounts and financial accounts .

I. Introduction

1. The System of National Accounts 2008 recognizes that pension entitlements derived from employment-related defined benefit plans are contractual agreements that should be treated as liabilities of the pension plan sponsors and assets of households, regardless of whether the pension plan is fully funded. It recommends that the employer's contribution should be based on accrual principles, calculated as the increase in the net present value of the pension entitlement attributable to service to the employer in the period, after accounting for costs of operating the pension and for any contribution made by the employee. It also recommends that the financial accounts and balance sheets should show an explicit liability of the pension fund to the employee with respect to the pension entitlement, and that any excess of the liabilities over the available assets may represent a claim on the pension sponsor. In 2013, this accrual-based approach was implemented in the US national income and product accounts (NIPA) and financial accounts.

2. The adoption of the SNA 2008 treatment of defined-benefit pension plans provides a number of benefits to users of the accounts:

(a) The accrual treatment of compensation better reflects the pension benefits earned by the employee while working than the cash-based SNA 1993 treatment and more closely aligns the accrual of pension benefits with the employee's work;

(b) The accrual treatment is consistent with business accounting standards;

(c) The accrual measure of compensation is generally less volatile than the cash-based measures and reflects the relatively smooth manner in which benefits are earned;

(d) When pension plans are underfunded, the accounts recognize the employer's liability for promised benefits, providing a more accurate assessment of the employers' and employees' financial obligations and claims and net worth;

(e) Accrual-based measures yield more accurate measures of household income and saving than cash-based measures.

3. The effects of adopting the SNA 2008 treatment varied across the major sectors of the US accounts because of differences in the institutional features of each sector. For non-financial and financial corporations, there has been decreasing reliance on defined-benefit plans as employers have increasingly switched to defined-contribution plans. Furthermore, their plans generally tend to be nearly fully funded except for periods following large holding losses on plan assets. The federal government plans, on the other hand, have been only partially funded. Because large numbers of covered employees whose benefits were not adequately funded during their careers have now retired, the legacy of underfunding is requiring the federal government to make large "catch-up" contributions. As a consequence, the accrual measures of federal government compensation for recent years are smaller than the previous measures that were based on cash contributions. Finally, the state and local government plans have recently become underfunded due to poor investment returns and insufficient contributions. As a result, the accrual measures of state and local government compensation tend to be larger than the previous cash-based measures.

4. In addition to effects on compensation, the recognition of unfunded pension liabilities also affected the measures of property income. As will be discussed in paragraphs 35 to 37, the US interpretation of the SNA 2008 treatment of claims of pension funds on pension sponsors for unfunded pension entitlements includes the accrual of interest charges. In recent years, the interest accruing on unfunded pension liabilities raised the interest payable by general government. In the case of the federal government, the increase in interest payable resulting from the new treatment more than offset the reduction in

compensation expenditures, leading to a small downward revision to net saving. For state and local governments, the effect was larger because both compensation and interest expenditures were revised up.

5. At the end of 2013 the US financial accounts recognize $11,219 billion in defined-benefit pension entitlements, of which $3,065 billion, or 27%, represents unfunded claims of pension funds on their sponsors that had not been recognized under SNA 1993. These unfunded pension liabilities are concentrated in the public sector, with the federal government having unfunded liabilities of $1,780 billion (10% of GDP) and state and local government having unfunded liabilities of $1,097 billion (6% of GDP). Recognition of these liabilities provides data users with a more accurate picture of the financial obligations of pension plan sponsors.

II. Employment-based pensions in the US

6. In March 2013, 49% of private industry workers in the US participated in a pension plan. However, only 16% participated in a defined-benefit plan, whereas 46% participated in a defined-contribution plan. (Most participants in defined-benefit plans also participated in a defined-contribution plan.) Participation in defined-benefit plans was most common for union workers (68%) and for workers in the utilities (75%), finance and insurance (45%), and information (40%) sectors. Only 7% of part-time workers participated in a defined-benefit plan.[1]

7. In private industry, the use of defined-benefit plans has been declining since the early 1980s, when defined-contribution plans became widely available. The number of defined-contribution plans increased from 207,748 in 1975 to 669,157 in 2008, after which it fell to 638,390 in 2011. In contrast, the number of defined-benefit plans peaked in 1983 when there were 175,143 plans; by 2011 it had fallen to 45,256.[2] When an employer terminates a defined-benefit plan, they are required to distribute the accrued benefits, usually by purchasing an annuity. Many plans are also “frozen”—that is, closed to new workers and no longer allowing participants to earn new benefits through service to the employer. In March 2013, 26% of all private industry workers participating in defined-benefit pension plans were in “frozen” plans.[3]

8. The federal government began regulating private pension plans with the enactment of the Employee Retirement Income Security Act of 1974 (ERISA). This legislation established federal requirements for participation, funding, vesting, reporting, fiduciary duties, and financial disclosure, and also created the Pension Benefit Guaranty Corporation, which guarantees the payment of basic benefits when a pension sponsor experiences bankruptcy. Private pension sponsors are required to file annual reports, Form 5500, which are filed with their federal corporate income tax returns and form the basis for the estimates in the US national accounts.

9. In the public sector, most workers continue to participate in defined-benefit pension plans. Among employees of state and local governments, 85% participated in a retirement plan, with 78% participating in a defined-benefit plan and 15% in a defined-contribution plan. Among union workers, 90% participate in a defined-benefit plan, compared to 69% of

[1] US Department of Labor, Bureau of Labor Statistics (2013), “National Compensation Survey: Employee Benefits in United States, March 2013,” Bulletin 2776 (September).
[2] US Department of Labor, Employment Benefits Security Administration (2013), “Private Pension Plan Bulletin Historical Tables and Graphs,” (June).
[3] See US Department of Labor, Bureau of Labor Statistics (2013).

nonunion workers. In educational establishments, 82% of workers participate in a defined-benefit plan, the same percentage as in public administration establishments. These percentages contrast with healthcare and social assistance establishments, where 61% of workers participate in a defined-benefit plan.[4]

10. Public-sector retirement plans are regulated by the federal Internal Revenue Code, but they are excluded from some sections of ERISA. For example, they are not required to file the same annual reports, Form 5500, that are required from private plans. A number of states provide additional protection to participants in their government pension plans in the form of constitutional or statutory guarantees protecting their accrued benefits.

11. In 2011, US state and local government defined-benefit plans had 14.5 million active members (that is, current contributors) and 8.6 million beneficiaries (members receiving benefits). In 2011, there were 3,418 state- and locally-administered plan pension systems, with 222 state-administered systems accounting for 84% of total assets. In a number of states, a state-administered system also provides pension coverage on behalf of local-government employees. State and local plans tend to invest in a diversified portfolio of domestic and foreign stocks, bonds, and other financial assets, similar to the mix of assets held by private plans.[5]

12. Federal government agencies sponsor about 40 defined-benefit plans for their employees, with three large plans (a plan for military personnel and two for civilian employees) accounting for the bulk of the participants. In 2007 there were 8.7 million total participants and 4.1 million active participants in the federal defined-benefit plans. In addition, the federal government sponsors a large defined-contribution plan, the Thrift Savings Plan.[6]

13. In contrast to private and state and local government defined-benefit plans, the assets held by the federal plans consist almost entirely of special Treasury securities. Two of the three major federal government plans have been chronically underfunded for decades; in fact, the military plan was unfunded until a trust fund was established in 1984.

III. SNA 1993 treatment of defined-benefit pension plans

14. Annex IV of SNA 1993 provides a summary of its treatment of pension funds. Table 1 presents a numerical illustration of the SNA 1993 treatment that is consistent with the numerical illustration of the SNA 2008 treatment that appears in Chapter 17 of SNA 2008.[7] By providing an illustration using consistent numbers for the two treatments, we are able to directly compare the effects of the new treatment introduced in SNA 2008 with the previous treatment.

[4] See US Department of Labor, Bureau of Labor Statistics (2013).

[5] Becker-Medina, Erika (2013), "Annual Survey of Public Pensions: State- and Locally-Administered Defined Benefit Data Summary Report: 2011," Government Division Briefs, United States Census Bureau (August).

[6] Reinsdorf, Marshall B., and Lenze, David G. (2009), "Research Spotlight: Defined Benefit Pensions and Household Income and Wealth," *Survey of Current Business* 89 (August): 50–62.

[7] The numerical illustration in Table 1 is based on the example appearing in Table 17.8 of *SNA 2008*. I have made one small change in assumptions from Table 17.8. Table 17.8 shows the pension fund having output of 0.6, but does not show any intermediate consumption, compensation of employees, or other costs of production. Because pension funds, as non-profit enterprises, would be expected to have output equal to the costs of production, I have added an entry for intermediate consumption of 0.6, assuming that the pension fund outsources all of its management and other production activities to an external manager or operator.

15. While SNA 1993 treats autonomous pension plans as institutional units in the financial corporations sector that engage in financial transactions and make investments on their own account, it also treats them effectively as "pass-through" institutions that are assets of the household sector, with all of their property income and saving attributable to households. This treatment requires that several transactions need to be re-routed in order to exhibit certain general principles underlying the transactions.

16. The SNA 1993 records the contributions to funded pension plans as the actual contributions made by employers and employees. In contrast to SNA 2008, it does not measure the pension entitlements accrued by employees by their service.[8] In the numerical example shown in Table 1, we assume that the employer contributes 10.0 to the plan, and the employees contribute 1.5. The employers' actual contribution is included in compensation of employees in the generation of income account and is shown as payable to households in the allocation of primary income account. The employers' actual contribution is then re-routed to the pension plan in the secondary distribution of income account.

17. The pension fund makes investments on behalf of its beneficiaries and is assumed to receive 2.2 in property income. That property income is then attributed to households in the allocation of primary income account, so that the property income from these investments appears in the balance of primary incomes of the household sector. In the secondary distribution of income account, this property income is re-routed to the pension fund as contribution supplements.

18. The treatment of pensions in SNA 1993 largely parallels the treatment of insurance, and it recommends that output of the pension fund should be measured analogously to insurance corporations. Specifically, the formula recommended for measuring the output of autonomous pension funds is equal to: (a) total actual contributions earned, (b) plus total contribution supplements, (c) less pension benefits, (d) less increases (plus decreases) in pension reserves. From the numerical example in table 1, actual contributions are 11.5, contribution supplements are 2.2, benefits are 16, and the decrease in pension reserves is 2.9, implying that the pension fund's output is 0.6.[9] The consumption of this output is shown as household final consumption expenditure in the use of income account, with the offset for this implicit transaction appearing as a factor that reduces employees' net social contributions in respect of pensions.

19. To complete our discussion of the secondary distribution of income account, we must describe what is sometimes referred to as "dual recording" of pensions in the SNA. In the allocation of primary income account, all compensation of employees and property income associated with the pension fund is assigned to the household sector, reflecting the principle that the pension funds are "assets of the households entitled to receive pensions in the present or future periods" (SNA 1993 7.127). The SNA could treat other transactions related to pensions, such as contributions or payment of benefits, as financial transactions, reflecting the principle of household ownership of the fund. Alternatively, the SNA could treat these transactions as redistributive in nature, treating payment of contributions to the fund as a reduction in the resources available to households and the payment of benefits to households by the fund as household income. Rather than choosing one approach or the other, both SNA 1993 and SNA 2008 have adopted "dual recording," in which both an ownership-based approach and a redistributive approach are applied, albeit in different accounts and to different balancing items. Thus, for example, based on ownership,

[8] *SNA 1993*, however, does allow for imputed contributions in the case of unfunded pension schemes (see paragraphs 7.45 to 7.47).

[9] In the US national accounts, the sum-of-costs approach is used to estimate the output of pension plans, and it is the approach now recommended by *SNA 2008* (paragraph 6.203).

compensation of employees and property income on plan assets is treated as primary income of the household sector.

20. In contrast, employer and employee contributions to the pension fund, along with "household pension contribution supplements" (reflecting the property income attributed to households) are recorded as redistributive transactions in the secondary distribution of income account, while benefits are recorded as transfer payments by the fund to households. Thus, disposable income excludes pension contributions and includes pension benefits. Specifically, the secondary distribution of income account records employers' actual pension contributions and employees' net social contributions in respect of pensions flowing from households to the pension fund, and pension benefits flowing from the pension fund to households. The employees' net social contributions in respect of pensions are calculated as (a) household actual pension contributions, (b) plus household pension contribution supplements (effectively, a repayment of the property income that has been attributed to households), (c) less pension service charges (which are equal to the final consumption expenditure recorded for pension plan services). In the numerical example shown in Table 1, the employees' net social contributions are 3.1 = 1.5 + 2.2 – 0.6.

21. The SNA, however, measures saving on an ownership basis. To reconcile the two different bases for the recording of disposable income and the recording of saving requires that an "adjustment for the change in net equity of households in pension funds" be shown in the use of disposable income account to reconcile disposable income with saving. This adjustment is equal to total household contributions in respect of pensions in the secondary distribution of income account less pension benefits payable (in Table 1, –2.9 = 10.0 + 3.1 – 16.0). Note that net saving of the pension fund is equal to zero.

22. In the financial account, a matching item is shown as net equity of households in pension fund reserves. Although the financial transactions between the pension fund and households regarding net equity of households in pension fund regards are consolidated in a single flow, it should be noted that it reflects the exact same transactions that are recorded in the secondary distribution of income account—specifically, additions to the net equity of households in pension funds are equal to employers' actual pension contributions and employees' net social contributions (including employees' actual contributions and contribution supplements, less pension service charges),while reductions to net equity are equal to pension benefits. Hence, the term "dual recording" is used to describe the repeated recording of these same transactions.

23. The national accounts of the United States and several other countries do not use the dual recording approach to pensions. The US Bureau of Economic Analysis (BEA) uses the ownership basis throughout, taking the view that dual recording adds an unnecessary layer of complexity to the accounts and that the same information can be provided in more straight-forward manner by presenting them as addenda or supplementary entries in the national accounts tables. In the new defined-benefit pension tables that BEA introduced in 2013 along with the new SNA 2008-based treatment, BEA provides the full details that could be used to construct the dual-accounting measures, but these are presented as supplementary measures rather than as elements of the core sector accounts.

24. The SNA 1993 is somewhat ambiguous with respect to the question of whether pension funds can have net worth. On the one hand, it states:

> "Pension funds consist of the reserves held by autonomous funds established by employers and/or employees to provide pensions for employees after retirement. The reserves, and the income received by investing the reserves in financial assets, land or buildings, are treated in the same way as technical reserves and investment income associated with life insurance taken out under a social insurance scheme. The pension funds are assets of the households entitled to receive pensions in the

> present or future periods and constitute liabilities of the institutional units administering the funds." (7.127)

This statement suggests that pension funds are pass-through entities with the ownership of all assets assigned to households, which would imply that the pension fund itself has a net worth of zero. On the other hand, paragraph 13.78 indicates that the pension fund's liabilities should be equal to the present value of defined benefits and that its net worth need not be zero:

> "Benefits are related by some formula to participants' length of service and salary and are not totally dependent on the assets in the fund. A case can be made that a defined benefit pension fund can have a net worth, positive or negative, if assets of the fund exceed or fall short of the fund's liability for the guaranteed benefits. Whether assets of the fund exceed the fund's liability for the guaranteed benefits - i.e., if the plan is over-funded - or fall short [of] the fund's liability - i.e., if the plan is under-funded - there is some expectation that the situation will be temporary, typically by adjusting contributions. Further, national law, especially with respect to over-funding, varies with respect to the question to whom, employers or households, a surplus or short-fall is to be attributed. The System, in this situation, allows a defined benefit pension plan to have a net worth. The liability of a defined benefit pension plan is equal to the present value of the promised benefits."

Note that this paragraph suggests that any short-fall in funding should be temporary and quickly corrected by an adjustment to contributions. But by regarding any over-funding or under-funding as temporary, SNA 1993 avoided addressing the implications of over- or under-funding on the rest of system. In practice, in the US financial accounts and integrated macroeconomic accounts prior to our 2013 change in treatment, the balance sheets treated defined-benefit plans as simple pass-through entities, in which pension funds' liabilities (and households' pension assets) were shown as equal to the value the pension funds' financial and non-financial assets.

IV. SNA 2008 treatment of defined-benefit pension plans

25. The fundamental conceptual change made in the update of the standards is that SNA 2008 recognizes that pension entitlements are long-term contractual agreements between employers and employees that are legally enforceable. The promise to pay a fixed pension benefit is recognized as a liability of the pension plan sponsor[10] towards households, regardless of whether a pension fund exists that holds the necessary assets to fulfill those promises (SNA 2008 A3.127, 11.107). Furthermore, accrual-based estimates of pension compensation and liability are to be based on actuarial calculations, which have now become standard in business accounting. The revised SNA clarifies that the assets of the fund are regarded as belonging to the fund and not (as stated in SNA 1993) as belonging to the employee, that an explicit liability of the pension fund to the employee for the actuarial pension entitlement should be shown in the financial account and balance sheet, and that a liability for any underfunding should be recorded as a claim of the pension fund on the plan

[10] This paper uses the term "pension plan sponsor" in to refer to the institutional unit that "retains the responsibility for any deficit in funding as well as the right to retain any excess funding"—*SNA 2008* refers to this unit as the "pension manager." In the United States, however, the term "pension manager" is generally used to refer to the person or business hired to supervise the fund's investments and other operations, so we have substituted "sponsor" for clarity. A pension plan's sponsor is usually the employer, though it may be a labor union, an industry association, or other unit, especially in the case of multi-employer plans.

sponsor, and a claim of the sponsor on the pension fund should be recorded for any overfunding. (SNA 2008 17.166)

26. An employer who offers a defined-benefit plan is obligated to pay future benefits according to a formula that usually is based on the level of pay and the time in service. Thus, with each additional year of service, there is an increase in the employee's pension entitlement. The claims to benefits accrued through service, also known as "normal cost," are equal to the present value of the incremental addition to benefits accrued through the employee's service during the period. The pension component of compensation of employees is calculated as the normal cost plus the service charge, less the employees' actual contributions. In the numerical example, which is shown in Table 2, the normal cost is 15.0, the employees' actual contribution is 1.5, and the service charge is 0.6, so the pension component of compensation of employees is calculated as 14.1 = 15.0 + 0.6 – 1.5. As seen in Table 2, SNA 2008 introduces a new transaction for "employers' imputed pension contributions," which is calculated residually as the total (actuarially derived) pension compensation less the employers' actual contributions (that is, 4.1 = 14.1 – 10.0).

27. The next change introduced in SNA 2008 is that the property income attributable to policyholders has been renamed as "property income payable on pension entitlements." Furthermore, the calculation has been changed, so that the property income payable to households is no longer equal to the investment income received by the pension fund, but instead is equal to the increase in pension entitlement coming from past service, due to the effects of discounting the previously existing pension entitlement for one less period (the so-called "unwinding of the discount factor"). In Table 2, the result of this change in calculation is to attribute more property income to households under SNA 2008 (4.0) than under SNA 1993 (2.2), presumably because the discount rate being applied to the pension fund is larger than the average investment return recognized by the system. As will be discussed further below, the discount rate used in actuarial calculations will typically be larger than the rate of return implied by the plan's investment income because the SNA excludes returns on investment that are due to holding gains. Pension funds usually invest a substantial portion of their assets in equity shares, so a large portion of their returns to investment are expected to come in the form of holding gains. (Note that we are referring to the effects of expected holding gains, which have effects on the discount rate, and thereby on saving, even though actual holding gains and losses are excluded from the system.)

28. The other changes in the numerical example largely flow from these first two. The employers' imputed pension contributions are included along with other contributions in the secondary distribution of income account. The pension contribution supplements are equal to the property income payable on pension entitlements, which in turn reflect the unwinding of the discount factor. Both of these changes are reflected in the adjustment factor in the use of income account, which has been renamed as the "adjustment for the change in pension entitlements." The name change reflects the idea that the pension assets held by households are the entitlements to future pension benefits, rather than the assets of the pension fund.

29. In the secondary distribution of income account in Table 2, the household total pension contributions (19.0) in the secondary distribution of income account equal the sum of employers' actual pension contributions (10.0), employers' imputed pension contributions (4.1), employees' actual pension contributions (1.5), and household pension contribution supplements (4.0), less pension scheme service charges (0.6). The adjustment for the change in pension entitlements in the use of income account is equal to total household contributions in respect of pensions less pension benefits payable (in the Table 1, 19.0 – 16.0 = 3.0). Note that the saving of the pension fund (–1.8) is no longer equal to zero, but is equal to the difference between property income received by the fund (2.2) less the property income payable on pension entitlements (4.0).

30. In the financial account, the same amount—total household contributions less benefits—appears as the change in pension entitlements, representing the claim of households on the pension fund. Changes in pension entitlements due to other factors, such as changes in the discount rate or other assumptions that enter the actuarial formulas, are generally recorded in the other changes in assets account, though certain plan amendments could be classified as current or capital transfers.

31. In the balance sheet, the pension entitlements for defined-benefit plans are based on an actuarial estimate of the liabilities of the pension sponsor (paragraphs 13.78, 17.147). Because the plan sponsor (usually the employer) is responsible for meeting the liabilities of the fund in case of any shortfall, a shortfall—whether due to the increase in pension entitlements, contributions and contribution supplements, investment income, or holding gains or losses—should be recorded as a claim of the fund on the sponsor. Similarly, when the assets held by the pension fund exceed the pension entitlements, the excess should be shown as a claim of the sponsor on the pension fund. In the United States, the plan sponsor generally cannot withdraw such an excess from the fund without incurring a large tax penalty, but the surplus does allow the sponsor to take a "contribution holiday" and refrain from contributing until the fund's assets and liabilities are again in balance. Thus, any claim of the sponsor on the pension fund functions analogously to a prepayment. As a consequence, the net worth of the pension fund should remain exactly zero at all times, as any shortfall or excess is immediately offset by a change in the claim of the pension fund on the pension sponsor (paragraph 17.165). However, as we will discuss below, SNA 2008 is unclear regarding how these changes in the claim of the pension fund on the pension sponsor should be recorded, with the exception of employers' imputed pension contributions, which are fully described in its example in Chapter 17.

32. With respect to non-autonomous pension funds and unfunded pension plans, SNA 2008 provides only limited guidance. It states that "employment-related pension entitlements are contractual engagements, that are expected or likely to be enforceable. They should be recognized as liabilities towards household, irrespectively of whether the necessary assets exist in segregated schemes or not" (paragraph A3.127). If a fund exists but is part of the same institutional unit as the employer, it should be recorded in the sector where the fund is located. If a fund does not exist, a notional fund is recorded in the employer's sector (paragraph 17.131, 17.149). SNA 2008 also allows for flexibility in the case of unfunded pension schemes sponsored by government via social security for all employees. Recognizing that in these cases reliable estimates of the entitlements may not be readily available and the government may possibly change the basis for determining pension benefits, it allows countries with these types of schemes to present information about pensions in a supplementary table rather than in the core accounts (paragraphs 17.191–17.206). With those exceptions, the recommendations for recording pension entitlements for non-autonomous and unfunded plans appear to be the same as for autonomous funds.

V. US implementation of SNA 2008 treatment of defined-benefit pension plans

A. Clarifications or modifications of SNA 2008 guidance

33. The introduction in 2013 of new SNA 2008 treatment of pensions in the US national accounts was the result of a coordinated effort by BEA, which produces the national income and product accounts (NIPA) and the Board of Governors of the Federal Reserve System (FRB), which produces the financial accounts of the United States, including the balance sheets. The two agencies jointly produce the integrated macroeconomic accounts of

the United States, which present a full set of institutional sector accounts. Research by the two agencies on this project was well underway by 2009.[11]

34. Although most of the work on this effort went toward gathering source data and developing methodologies for implementing the SNA 2008 guidelines, there were a few areas where the guidelines needed to be interpreted or clarified. The most important of these involved how to record changes in the claims of pension funds on the pension sponsor.

35. As noted in paragraph 31 above, paragraph 17.165 clearly states that the claims of pension funds on the pension sponsor need to adjust period by period in response to any transactions or other changes in assets that cause the assets and liabilities of the pension fund to change, in order that the net worth of the plan should remain exactly zero at all times. However, it does not indicate (except in the case of employers' imputed pension contributions) how that adjustment should take place. There seem to be three possibilities: property income, other changes in volume of assets, or revaluation. (I have ruled out the possibility of the adjustment appearing in the employers' imputed pension contributions because SNA 2008 is very clear that this item should only represent the difference between the actuarial value of the pension entitlement earned in the period and the employers' actual contribution; see, for example, paragraphs 17.146, 17.152–17.153.)

36. A number of factors contribute to fluctuations in a pension fund's assets, such as market fluctuations in property income received and in holding gains and losses. It seems reasonable that the effects of these types of fluctuations on the claims of pension funds on the pension sponsor should be treated as revaluations. However, when a plan is underfunded, another factor that is predictable is the unwinding of the discount factor on the pension entitlements. If the sponsor does not make catch-up contributions to the plan, the sponsor's liability will increase with each period that passes as the discount factor is applied to a shorter period of time. The general principle in the SNA is that the unwinding of the discount factor should be recorded as property income, with the classic example being the treatment of zero-coupon bonds (paragraphs 17.270–17.272). Indeed, another example is the SNA's recommended treatment of property income payable on pension entitlements, which also represents the unwinding of the discount factor for households' pension entitlements. The example shown in Chapter 17 does not show a property income transaction between the sponsor and the pension fund with respect to any underfunding or overfunding, but this seems to have been an oversight based on an assumption that pension funds are normally fully funded. In the US context, however, periods of persistent underfunding are not uncommon, especially for public sector pensions, so the issue could not be overlooked. The BEA and the FRB decided to apply the same discount rate that is used in the calculation of pension entitlements to calculate imputed interest transactions for any claims of pension funds on their sponsors due to under- or overfunding.

37. The effects of this modification of the SNA example are illustrated in Table 3. As seen in the allocation of primary income account, we have added a line for "imputed property income on plans' claims on sponsors." The value shown in this line (1.1) is

[11] See Reinsdorf and Lenze (2009); Marshall Reinsdorf (2009), "Actuarial Measures of Defined Benefit Pension Plan: Wealth and Income of US Households," in *Eurostat Workshop on Pensions*, edited by Reimund Mink and Marta Rodriguez Vivas, European Central Bank (29–30 April), pp. 188–215. Dominque Durnat, David Lenze, and Marshall Reinsdorf (2010), "Adding Actuarial Information on Defined Benefit Pension Plans and Social Security to the National Accounts," Banque de France and Bureau of Economic Analysis, paper prepared for the CRIW/NBER conference on "Wealth, Financial Intermediation and the Real Economy" (November); Marshall Reinsdorf (2013), "Comment on the Treatment of Defined Benefit Pension Plans in the SNA," OECD and Australian Bureau of Statistics, Workshop on Pensions, 22–24 April 2013, Document A. II. 2.

calculated as the discount factor used for the calculation of pension entitlements times the value of claim of the pension fund on the sponsor. In the case of an overfunded plan, the claim of the pension fund on the sponsor will be negative, in which case the imputed interest would flow from the pension fund to the sponsor. It represents property income payable by the pension sponsor and receivable by the pension fund to reflect the unwinding of the discount factor on the portion of the pension entitlements that are not funded by other assets of the pension fund. In effect, the sponsor's failure to fully fund its pension obligations is similar to a loan from the pension fund to the pension plan sponsor.

38. Another issue that arises in the implementation of SNA 2008 is the composition of the pension funds subsector. According to SNA 2008 paragraph 4.116, "The pension fund subsector consists of only those social insurance pension funds that are institutional units separate from the units that create them. The source data that are available to BEA do not directly address the criteria for whether a pension fund qualifies as an institutional unit. However, the US laws and regulations described in paragraph 8 generally guarantee that pension funds exercise ownership rights, maintain a complete set of accounts, do not co-mingle their assets or activities with those of the pension sponsor, and otherwise satisfy the criteria to be recognized as institutional units. Consequently, in the US national accounts all defined-benefit pension plans have been classified in the pension funds subsector.

39. The one area where the classification of pension funds might be questioned is for the federal government pension plans. The BEA recognized the federal pension plans in the 1999 NIPA comprehensive revision, partly in response to a change that was introduced in SNA 1993 that allowed government employee pension funds to be classified in the financial corporations sector even if most of their funds are invested in government securities (paragraph 4.98). However, BEA's decision has been somewhat controversial, and a case can be made that the federal employee retirement funds do not satisfy the criteria for institutional units. For example, the Budget of the U.S. Government says "the Federal Government owns the assets of most Federal trust funds, and it can raise or lower future trust fund collections and payments, or change the purposes for which the collections are used, by changing existing laws."[12] The federal government does prepare actuarial estimates for its main employee retirement funds, and we think that the presentation is simpler if all pensions are shown in the pension subsector. It should be emphasized that under SNA 2008, the liabilities and net lending or borrowing of the federal government are not affected by the sector in which its pension funds are classified. The liabilities are determined by the pension entitlements, and if the pension fund were treated as part of the federal government sector, the full value of the pension entitlements would still be shown as a liability of the federal government and an asset of the household sector, unless the flexibility to not include unfunded government pension liabilities in the core accounts (as described in paragraph 32 above) is utilized,.[13]

40. The final area in which the US accounts have introduced a modification of the SNA 2008 guidance is in the treatment of the saving associated with holding gains. As described

[12] Office of Management and Budget (2014), *Analytical Perspectives, Budget of the U.S. Government, Fiscal Year 2015*, Washington, DC, Government Printing Office, p. 95.

[13] The US case does not appear to satisfy the criteria described by *SNA 2008* for allowing for flexibility. Contrary to the case described in paragraph 17.192–17.193, the US federal government employee retirement plans are not sponsored for all employees, but rather only for the government's own employees, and reliable estimates are available from the actuarial accounts that are prepared by the government's Office of Personnel Management and Department of Defense for the three main civilian and military plans. With respect to uncertainty about possible changes to the plans, it seems preferable to provide on-going information, even if it changes with future changes in the law, to allow for accurate measurement of the effects of those laws.

in paragraph 27 above, most pension funds invest in portfolios that include equity shares. Because they expect part of their investment income to come in the form of holding gains, which are not included in SNA measures of income, pension plan actuaries are able to assume a discount rate that is larger than the rate of return in the form of property income that is treated as current income in the system. As a result, the property income payable on pension entitlements will generally be larger than the property income received by the pension fund, even when the pension is fully funded, and the pension fund will persistently show negative saving, or dissaving. The offset to this dissaving is an increase in household saving relative to saving as measured in SNA 1993.

41. In the United States case, the magnitudes are large—the difference between pension funds' property income received (including the imputed property income on plans' claims on sponsors) and the property income payable on pension entitlements is usually about 1% of GDP, or about 1.5% of household disposable income. Even though SNA 2008 clearly states that the amount funded from holding gains should not be deducted (paragraph 17.156), we had several concerns with the implications of this change: (1) Conceptually, pension funds provide financial services on behalf of households in order to assist them with saving for retirement. In SNA 2008, pension funds, by construction, have a net worth of zero. In this context, the idea that pension funds engage in persistent and large levels of dissaving is difficult to understand and would probably be difficult to explain to users. (2) The saving of corporations is a closely watched indicator of the internal funds available for investment. A large downward revision to corporate saving would have a large impact on the usefulness of the measure for this purpose, especially since the revision would not be a reflection of the actual retained earnings available for investment. (3) We are aware that internationally, other countries had not yet implemented the new treatment of pensions and that there is a pensions task force that is reviewing issues with implementing the SNA 2008 treatment. We thought it would be imprudent to introduce a large revision that affects corporate and household saving if there was a possibility that the guideline might be reconsidered.

42. As a consequence, the US national accounts are recording, in the core accounts, a property income payment from the pension funds to the household sector that matches the property income receivable by the pension funds. This amount includes both the property income on investments and the imputed property income on plans' claims on sponsors, but does not include the amount attributable to holding gains. In the example shown in Table 3, the payment from pension funds to the household sector is recorded as "Property income payable on assets to households" (3.3) and is equal to the sum of property income on investments (2.2) and imputed property income on plans' claims on sponsors (1.1). Note that this amount (3.3) is smaller than the property income payable on pension entitlements recommended by SNA 2008 as shown in Table 2 (4.0). The US accounts show the property entitlements earned as an addenda item in the presentation of pensions, and the difference is reflected in the balance sheet as a revaluation.

B. Source data and methods

43. In business accounting, there are two broad actuarial methods for accounting for the accrual of pension benefits, the accumulated benefit obligation (ABO) method and the projected benefit obligation (PBO) method, both of which are regarded as acceptable by SNA 2008. [14] For privately sponsored and state and local government sponsored plans, the

[14] The accumulated benefit obligation (ABO) method counts only the benefits that have already been accrued and excludes the effects of projected future events, such as pay raises. This represents the

US national accounts adopted the ABO method. In the case of private plans, the ABO method aligns with the available source data and with the legal standards for pension plan funding. Although most state and local government plans use the PBO method for their own accounts, for the US national accounts the data were converted to the ABO method to ensure that their obligations and transactions are comparable to private plans. In the case of federal government plans, however, the national accounts use the PBO method in order to maintain consistency with the published actuarial estimates and the methods that are used to determine the required contributions to these plans.[15]

44. Estimates for privately sponsored defined-benefit plans (including plans sponsored by non-financial and financial corporations and by nonprofit institutions serving households) since 2000 are based on actuarial data reported on Internal Revenue Service form 5500. The actuarial data are derived under an ABO method. BEA adjusted the data to use a common discount rate for all plans, which is based on the AAA corporate bond rate. Prior to 2000, the compensation estimates were extrapolated backwards by applying the normal cost rate to covered payrolls for each period, with the normal cost rate extrapolated using future benefits paid as an indicator. Beginning in 1984, estimates of current receipts and expenditures (including compensation, property income, contributions, and pension benefits) are presented in BEA NIPA table 7.21; the financial account is presented in FRB financial accounts table F.117.b, and financial assets and liabilities are presented in tables L.117 and L.117.b.

45. Estimates of defined benefit plans sponsored by state and local government since 2000 are based on a large sample of actuarial reports issued by plan sponsors. BEA adjusted the actuarial data to reflect an ABO method and the same discount rates that were used for private plans. Prior to 2000, the compensation estimates were extrapolated by applying the normal cost per employee to covered employees from Census Bureau and other surveys; the estimates also used periodic surveys that describe the pension plans' characteristics. Beginning in 1929, estimates of current receipts and expenditures are presented in BEA NIPA table 7.23; beginning in 1946, the financial account is presented in FRB financial accounts table F.118, and financial assets and liabilities are presented in table L.118.

46. Estimates of defined benefit plans sponsored by the federal government since the mid-1980s are based on annual actuarial reports prepared by the Office of Personnel Management (for major civilian plans) and by the Department of Defense (for the military plan). Prior to the mid-1980s, the compensation estimates were extrapolated by applying normal cost rates to payrolls, taking into account historical changes in benefit rules and prevailing interest and inflation rates. The estimates were also boosted slightly to account for smaller retirement plans, such as those for employees of the Foreign Service and the Coast Guard, which are not covered by the main source data. Beginning in 1929, estimates of current receipts and expenditures are presented in BEA NIPA table 7.22; beginning in 1946, the financial account is presented in FRB financial accounts table F.119, and financial assets and liabilities are presented in table L.119.

amount that is treated as a liability of the sponsor in the event that a plan is frozen or terminated. The projected benefit obligation (PBO) method, on the other hand, attempts to account for future pay increases. For further discussion, see paragraphs 17.180 to 17.186 of *SNA 2008*.

[15] The major changes in the 2013 comprehensive revision of the NIPA, including the sources and methods used for the accrual approach to pensions, are described in Bureau of Economic Analysis (2013), "Preview of the 2013 Comprehensive Revision of the National Income and Product Accounts: Changes in Definitions and Presentations," *Survey of Current Business* 93 (March): 13–39.

C. Estimates

47. Data for 2012 for some of the major national accounts series on defined-benefit pension plans are presented in Table 4. To provide context, this table shows the values for each series as a percent of GDP. Whereas under the previous estimates, compensation of employees was measured by employers' actual pension contributions, under the new estimates the compensation reflects the employers' normal cost, with the difference between employers' normal cost and actual contributions recorded as employers' imputed pension contributions. For employees engaged in non-market production—that is, employees of general government and of nonprofit institutions serving households—the imputed contributions represent a revision to GDP, because value added for these sectors is measured as the sum of costs. For market producers, including private corporations and public-sector quasi-corporations, there is no change to value added, and the offset to the revision to compensation of employees is in the operating surplus. We see that in 2012, both private pensions and federal government pensions had negative imputed pension contributions, reflecting the relative underfunding of pensions in both sectors and the need to make catch-up contributions. In contrast, even though the state and local government pension funds were also underfunded, the imputed contributions were positive, indicating that the underfunding was exacerbated by low levels of actual contributions. Due to the offsetting directions of the revisions to federal and state and local government compensation, the net effect on GDP was small.[16]

48. The newly recognized flow for imputed property income on plans' claims on sponsors is small for private plans, but is larger for plans sponsored by state and local government (0.5% of GDP) and by the federal government (0.6% of GDP). It also should be noted that for the federal government, the addition to imputed property income on plans' claims on sponsors mostly offsets the reduction in imputed pension compensation, so the effect on the fiscal balance was relatively small. This result emphasizes the importance of showing the imputed property income, because persistent deficits in contributions must eventually be repaid by large catch-up cash contributions. A system that uses accrual methods for contributions also needs to take account of accrued property income. For state and local government plans, on the other hand, both imputed pension contributions and imputed property income are additions to current expenditures and to the sector's borrowing requirements.

49. The implied funding from holding gains can be derived by subtracting the sum of the property income received by the plans and the imputed property income on plans' claims on sponsors from the property income accrued on pension entitlements. The federal government plans, which do not invest in equity shares, are not receiving funding from holding gains. But for both private and state and local government plans, a significant share of the increase in pension entitlements is the result of implied funding from holding gains; together, they amount to nearly 1% of GDP and more than 1% of household disposable income. As described in paragraphs 40 to 42 above, the NIPA exclude the implied funding from holding gains from their measure of property income flowing from the pension fund to the household sector. Pension benefits and withdrawals represented about 3.4% of GDP in 2012.

50. Finally, the levels of pension entitlements and the portions that are funded by assets and by claims on sponsors are shown on the last three lines of Table 4. The new measure of

[16] Estimates of the revisions resulting from this and other conceptual changes were published in Stephanie H. McCulla, Alyssa E. Holdren, and Shelly Smith (2013), "Improved Estimates of the National Income and Product Accounts: Results of the 2013 Comprehensive Revision," *Survey of Current Business* 93 (September): 14–45.

pension entitlements led to an upward revision to household wealth equivalent to about 20% of GDP, while the recognition of the liabilities of pension sponsors on unfunded pension entitlements increased the liabilities of the general government sector by a similar magnitude. In Chart 1, we see the variation in the shares of pension entitlements that are funded over the business cycle. The US stock market declined from 2000 to 2002, and again from 2007 to 2009, which resulted in declines in the share of private and state and local government pension entitlements that were funded by assets. These estimates of assets and liabilities, which are newly available under the SNA 2008 guidelines, provide data users with a more accurate picture of household retirement assets and of the liabilities of pension sponsors.

Table 1
Treatment of defined-benefit pensions under SNA 1993

Uses										*Resources*
Employer	***Pension fund***	***Households***	***Other sectors***	***Total economy***		***Employer***	***Pension fund***	***Households***	***Other sectors***	***Total economy***
					Production account					
					Output		0.6		0.6	1.2
	0.6			0.6	Intermediate consumption					
					Generation of income account					
10.0				10.0	Employers' actual pension contributions					
					Allocation of primary income account					
					Employers' actual pension contributions			10.0		10.0
			2.2	2.2	Property income		2.2			2.2
	2.2			2.2	Property income attributable to policyholders			2.2		2.2
					Secondary distribution of income account					
		10.0		10.0	Employers' actual pension contributions		10.0			10.0
		3.1			Employees' net social contributions in respect of pensions		3.1			
		1.5		1.5	= Household actual pension contributions		1.5			1.5
		2.2		2.2	+ Household pension contribution supplements		2.2			2.2
		-0.6		-0.6	– Pension scheme service charges		-0.6			-0.6
	16.0			16.0	Pension benefits			16.0		16.0
					Use of income account					
		0.6		0.6	Final consumption expenditure					
	-2.9			-2.9	Adjustment for change in net equity of HH in pension funds			-2.9		-1.1
-10.0	0.0	11.6	-1.6	0.0	*Saving*					
Change in assets										***Change in liabilities***
					Financial account					
					Net borrowing/lending	-10.0	0.0	11.6	-1.6	0.0
		-2.9		3.0	Net equity of households in pension fund reserves		-2.9			3.0
-10.0	-2.9	14.5	-1.6	0.0	Other financial assets					

Table 2

Treatment of defined-benefit pensions under SNA 2008

Uses										*Resources*
Employer	***Pension fund***	***Households***	***Other sectors***	***Total economy***		***Employer***	***Pension fund***	***Households***	***Other sectors***	***Total economy***
					Production account					
					Output		0.6		0.6	1.2
	0.6			0.6	Intermediate consumption					
					Generation of income account					
10.0				10.0	Employers' actual pension contributions					
4.1				**4.1**	**Employers' imputed pension contributions**					
					Allocation of primary income account					
					Employers' actual pension contributions			10.0		10.0
					Employers' imputed pension contributions			**4.1**		**4.1**
			2.2	2.2	Property income		2.2			2.2
	4.0			4.0	Property income **payable on pension entitlements**			**4.0**		**4.0**
					Secondary distribution of income account					
		19.0		19.0	Household total pension contributions		19.0			19.0
		10.0		10.0	= Employers' actual pension contributions		10.0			10.0
		4.1		**4.1**	**+ Employers' imputed pension contributions**		**4.1**			**4.1**
		1.5		1.5	+ Household actual pension contributions		1.5			1.5
		4.0		**4.0**	+ Household pension contribution supplements		**4.0**			**4.0**
		-0.6		-0.6	– Pension scheme service charges		-0.6			-0.6
	16.0			16.0	Pension benefits			16.0		16.0
					Use of income account					
		0.6		0.6	Final consumption expenditure					
	3.0			**3.0**	Adjustment **for the change in pension entitlements**			**3.0**		**3.0**
-14.1	-1.8	17.5	-1.6	0.0	*Saving*					
Change in assets										***Change in liabilities***
					Financial account					
					Net borrowing/lending	-14.1	-1.8	17.5	-1.6	0.0
		3.0		**3.0**	Change **in pension entitlements**		**3.0**			**3.0**
	4.1			**4.1**	Claim of pension fund on pension sponsor	**4.1**				**4.1**
-10.0	-2.9	14.5	-1.6	0.0	Other financial assets					

Source: SNA 2008, Table 17.8 (intermediate consumption added by author).

Note: Changes from SNA 1993 are shown in **bold** typeface.

Table 3

US modified treatment of defined-benefit pensions under SNA 2008

Uses									Resources
Employer	Pension fund	Households	Other sectors	Total economy		Employer	Pension fund	Households	Other sectors	Total economy
					Production account					
					Output		0.6		0.6	1.2
	0.6			0.6	Intermediate consumption					
					Generation of income account					
10.0				10.0	Employers' actual pension contributions					
4.1				4.1	Employers' imputed pension contributions					
					Allocation of primary income account					
					Employers' actual pension contributions			10.0		10.0
					Employers' imputed pension contributions			4.1		4.1
			2.2	2.2	Property income		2.2			2.2
1.1				**1.1**	**Imputed property income on plans' claims on sponsors**		**1.1**			**1.1**
	3.3			**3.3**	Property income payable **on assets to households**			**3.3**		**3.3**
					Secondary distribution of income account					
		18.3		18.3	Household total pension contributions		18.3			18.3
		10.0		10.0	= Employers' actual pension contributions		10.0			10.0
		4.1		4.1	+ Employers' imputed pension contributions		4.1			4.1
		1.5		1.5	+ Household actual pension contributions		1.5			1.5
		3.3		**3.3**	+ Household pension contribution supplements		**3.3**			**3.3**
		-0.6		-0.6	– Pension scheme service charges		-0.6			-0.6
	16.0			16.0	Pension benefits			16.0		16.0
					Use of income account					
		0.6		0.6	Final consumption expenditure					
	2.3			**2.3**	Adjustment for the change in pension entitlements			**2.3**		**2.3**
-15.2	0.0	16.8	-1.6	0.0	*Saving*					
Change in assets									Change in liabilities	
					Financial account					
					Net borrowing/lending	-15.2	0.0	16.8	-1.6	0.0
		2.3		**2.3**	Change **in pension entitlements**		**2.3**			**2.3**
	5.2			**5.2**	Claim of pension fund on pension **sponsor**	**5.2**				**5.2**
-10.0	-2.9	14.5	-1.6	0.0	Other financial assets					

Note: Modifications of SNA 2008 are shown in **bold** typeface

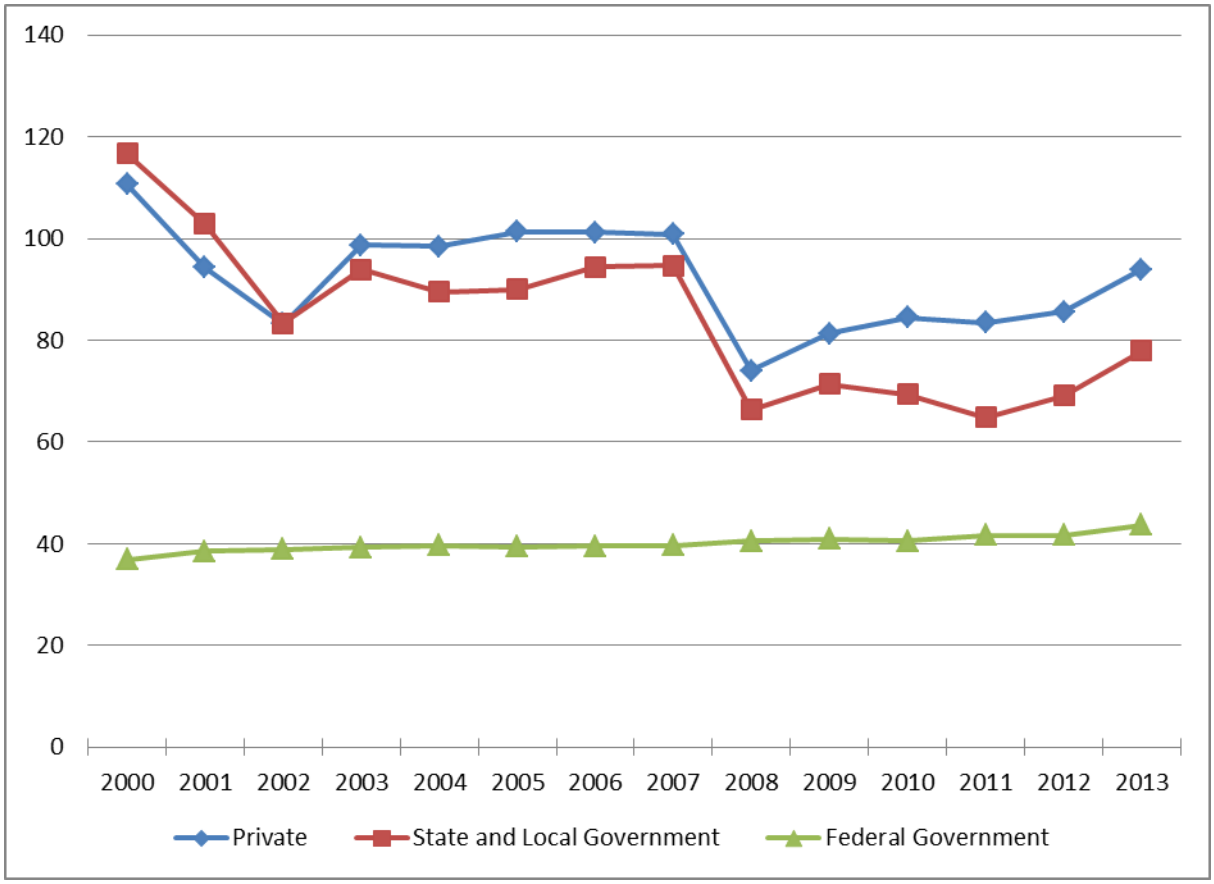
Table 4
Defined-benefit pensions in the US, selected flows and levels, as a percent of GDP, 2012

	Private	*State and local government*	*Federal government*	*Total*
Flows				
Employers' actual pension contributions	0.9%	0.6%	1.0%	2.5%
Employers' imputed pension contributions	-0.4%	0.5%	-0.6%	-0.4%
Property income received by plans (excluding claim on sponsors)	0.4%	0.4%	0.3%	1.2%
Imputed property income on plans' claims on sponsors	0.1%	0.5%	0.6%	1.3%
Property income accrued on pension entitlements	0.9%	1.4%	1.0%	3.3%
Implied funding from holding gains	0.4%	0.5%	0.0%	0.9%
Pension benefits and withdrawals	1.1%	1.5%	0.8%	3.4%
Levels *(end of year)*				
Pension entitlements	18.8%	29.4%	18.7%	66.9%
Funded by assets	16.1%	20.3%	7.8%	44.2%
Claims on sponsors	2.7%	9.1%	11.0%	22.8%

Sources: Bureau of Economic Analysis, national income and product accounts, tables 7.20 to 7.23; Federal Reserve Board, financial accounts of the United States, tables L.116 to L.119.

Chart 1

Shares of Defined-Benefit Pension Plans Funded by Assets, by Sector United States, 2000–2013



Sources: Federal Reserve Board, financial accounts of the United States, tables L.117 to L.119.