United Nations ECE/CES/GE.20/2010/12

Economic and Social Council

Distr.: General
15 February 2010

Original: English

Economic Commission for Europe

Conference of European Statisticians

Group of Experts on National Accounts

Tenth session
Geneva, 26–29 April 2010
Item 5 of the provisional agenda
Measuring and recording of pensions

Measuring and recording of household pension entitlements under government schemes in the euro area

Note by the Directorate General Statistics, European Central Bank

Summary

As a response to the ageing population in the euro area and in many industrial economies, the 2008 System of National Accounts aims at improving transparency and comparability of pension data across countries. This paper describes the internationally agreed methodology on recording of household entitlements under government pension schemes. The paper provides an overview of household pension entitlements and estimates of general government's pension obligations in the euro area. In addition, the alternatives for assessing sustainability of pension entitlements are explored.

I. Introduction

1. The approach to measure and record accrued-to-date household pension entitlements under government schemes and also the corresponding government obligations for the euro area follows national accounts principles. It has its origins in research work carried out by international organisations, including those of the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF). According to a survey article by the World Bank such studies date back to the mid-1990s and find implicit government pension liabilities of between 200 per cent and 350 per cent of Gross domestic product (GDP) for individual euro area countries.[1]

2. In the context of updating the The System of National Accounts, 2008 (2008 SNA) this approach has been further developed.[2] Estimates based on the refined approach (net present value of current entitlements) provide results in line with the original studies. However, measuring accrued-to-date pension entitlements does not suffice in itself to allow an assessment of the sustainability of public finances. This would require the inclusion of projections on future entitlements. However, time series on accrued-to-date pension entitlements and their changes provide useful information on how they change in response to economic, financial and demographic developments and also to reforms of government pension schemes.

3. The paper describes, in its Section II, the worldwide agreed methodology on the recording of household entitlements under government pension schemes. Section III provides a comprehensive view on household pension entitlements, while Section IV presents the estimates of euro area general government pension obligations. Section V compares accrued-to-date pension entitlements with sustainability measures and Section VI concludes.

II. Worldwide agreed methodology on the recording of household entitlements under government pension schemes

A. Current recording

4. The 1993 SNA and its European equivalent, the 1995 European System of Accounts (1995 ESA) record pension schemes in "social insurance" according to their features. For *private funded social insurance schemes* insurance technical reserves are recorded as liabilities and as household assets based on actuarial estimates. This is not the case for *unfunded (defined-benefit) social insurance schemes operated by employers*. For them, no

---

[1] R.Holzmann, P. Palacios and A. Zviniene, "On the economics and scope of implicit pension debt: an international perspective", Empirica, No 28, 2001, pp. 97-129. See also R. Mink and P. Rother, The statistical recording of implicit pension liabilities and its impact on household wealth and general government obligations, Irving Fisher Committee (IFC) Bulletin No 25, March 2007.

[2] The System of National Accounts, 2008 (2008 SNA) has been prepared jointly under the auspices of the Inter-Secretariate Working Group on National Accounts (ISWGNA) whose members are the Statistical Office of the European Commission (Eurostat), the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Statistics Division and regional commissions of the United Nations, Secretariat and the World Bank. The 2008 SNA is available at the website of the United Nations Statistics Division (http://unstats.un.org/unsd/sna1993/snarev1.asp).

reserves are recorded even if actuarial estimates could be carried out in principle. This also applies to *social security*.

5. This rather heterogeneous recording combined with the institutional differences across countries with respect to pension schemes (e.g. a relatively large proportion of private funded social insurance schemes in the United States, the Netherlands and the United Kingdom, as opposed to relatively large social security and government-managed unfunded defined-benefit schemes in most euro area countries) result in significant differences in the national accounts, making international comparisons difficult. In particular, household pension entitlements in countries with mainly private funded social insurance schemes are recorded as household assets, while rather small amounts of pension entitlements are recorded in countries in which pension schemes are predominantly organised as government-managed unfunded schemes, as in Germany, France and Italy.

6. Looking at the data currently reported in household balance sheets on life insurance and pension assets, euro area countries with a large proportion of defined-contribution schemes show rather high ratios of household life insurance and pension assets as a percentage of household gross disposable income (GDI) (Table 1). The opposite is the case for euro area countries with social security pension schemes for the majority of the population and also unfunded defined-benefit schemes managed by general government.

Table 1

Household life insurance and pension assets

(percentages of household GDI, at the end of the year)

Country area	*1999*	*2007*	*2008*
Euro area	64.4	84.0	79.7
Of which			
Germany	64.2	82.8	84.4
France	69.6	96.7	94.5
Italy	33.6	54.1	51.3
Netherlands	296.0	324.4	268.7
United Kingdom	261.5	247.9	201.8
United States	138.4	129.2	98.0
Japan	103.3	119.5	

Sources: European Central Bank (ECB), European Commission (Eurostat), United Kingdom K Office for National Statistics, United States Federal Reserve Board, United States Bureau of Economic Analysis, Bank of Japan, Economic and Social Research Institute, and the Cabinet Office of the Government of Japan.

Notes: End-of-year figures. Data include life insurance and pension assets; they refer predominantly to defined-contribution schemes.

7. In the euro area, defined-contribution pension entitlements (including life insurance products) totalled €4.9 trillion in 2007 and €4.8 trillion in 2008, covering 84 per cent and 80 per cent of household GDI or 11 per cent of household assets, held predominantly with pension funds.[3] In the United States, life insurance and pension assets amounted to $10.4 trillion in 2008, which corresponds to 98 per cent of household GDI or some 16 per cent of household assets.

[3] See Table 3.3 of the ECB Monthly Bulletin under the Euro area accounts sub-section of the Euro area statistics section.

B. Recommended recording in the 2008 SNA

8. Thus there is a potentially inconsistent treatment of pension schemes across sectors and countries depending on the administrative set-up of these schemes. Preparing the update of the 1993 SNA this was identified as an area of concern and there was an IMF-led Electronic Discussion Group in the period from 2002 to 2004, which culminated in discussions at the SNA Advisory Expert Group (AEG) in the period from 2004 to 2007.

9. In its meeting in Frankfurt in February 2006, the AEG concluded, that: (a) in principle pension entitlements/obligations (assets/liabilities) should be recorded on an actuarial basis for all employer schemes (whether funded or unfunded); but (b) recording of social security remains unchanged.

10. It quickly became apparent that the first of these conclusions raised some important issues in Europe, notably in the difficulty to distinguish unfunded government employer schemes from social security. Questions arose whether all or only part of them should be covered within the asset and liability boundary. These questions were closely linked to the issue to what extent the national accounts recording of pension entitlements should be harmonised while the underlying institutional reality differs significantly among countries.

11. The following discussions led to a worldwide compromise, which would allow for some flexibility in the recording of unfunded government employer schemes under clearly defined conditions. In essence, consensus had been achieved in the 2008 SNA on distinguishing between those pension schemes managed by general government which should be recorded in the core national accounts (like some defined benefit schemes for government employees), from those schemes whose entitlements should be recorded only in a supplementary table on pensions (like social security pension schemes).

C. The European Commission (Eurostat)/ECB Task Force on Pensions

12. To refine this outcome the Committee on Monetary, Financial and Balance of Payments Statistics (CMFB) established a European Commission (Eurostat)/ECB Task Force on Pensions (Task Force on Pensions) in 2006. In 2007, the work of the Task Force on Pensions concentrated on the design of the supplementary table. The overall logic of the table is to present, in its rows, the opening and closing stocks of pension entitlements for all pension schemes in social insurance (including social security), and the transactions and other economic flows during the period that account for the difference between the opening and the closing positions. The columns of the table show the types of pension schemes, with “non-core” schemes clearly distinguished in separate columns.

13. In designing the table economic flows needed to be clearly identified. In general the approach taken was to define what is in the “other economic flows” and in many transactions lines, with the “residual” left as imputed employer social contributions (i.e. the remaining part to be met by the employer). Other economic flows obviously include modelling effects which are split between revaluations (due to changes of the discount rate) and other changes in volume (due to changes in demographic developments).

14. Extensive discussion at the Task Force on Pensions generated the treatment of future wage increases. Future benefits in a defined-benefit scheme depend on the final or the average salary, and the usual career path of an employee involves periodic wage rises due to promotion. There are two ways in which future wage increases could be taken into account: either by (a) including them as they occur (the accrued benefit obligation (ABO) approach); or (b) projecting them in model (the projected benefit obligation (PBO) approach). The 2008 SNA describes the issue in detail but does not recommend one or the

other approach, leaving the decision to the modeller, who would need to consult carefully the applicable rules for each specific pension scheme.

15. Some other important points were raised in the Task Force and clarified also in the context of drafting the 2008 SNA like (a) to measure the output for all schemes; (b) to distinguish between the pension scheme manager (a unit which determines the conditions of a defined benefit scheme and possibly has a legal burden to meet shortfalls in pension scheme) and the pension scheme administrator (assets and liabilities are to be recorded in the national accounts to reflect the relationship between the manager and the unit administering the scheme); (c) to record transfers between pension schemes as financial transactions, with a pension liability being recorded for government if government assumes responsibility for future pension payments; and (d) to treat the reform of a pension scheme as a transaction or as an other economic flow depending on whether or not the reform is negotiated between the employer and employees. The treatment of "actuarial gains/losses" (if model assumptions do not turn out to be correct) is still a source of debate, since they could be viewed either as transactions or as other economic flows.

16. In parallel to the methodological work the Task Force carried out first estimates of accrued-to-date pension entitlements based on national models and on a benchmark model. The benchmark model was developed by the Research Centre for Generational Contracts of the Freiburg University. In this context, it was clearly indicated in the January 2008 CMFB Report of the Task Force and also presented to the Economic and Financial Committee (EFC) that pension entitlements as measured for government-managed pay-as-you-go schemes are not fiscal sustainability measures.[4] Instead, accrued-to-date pension entitlements display the cost of terminating such a pension scheme at the reference date of the accounts.

D. The new SNA and ESA chapters on pension schemes

17. Following these discussions, the 2008 SNA Chapter 17 (part 2 deals specifically with pensions) was adopted by the UN Statistical Commission in August 2008, subject to some specific follow-up issues, notably the concept of a pension scheme manager, the criteria for the core/non-core accounts treatment of pension obligations, and the recording of actuarial gains/losses. The 2008 SNA Chapter 17 includes the new mandatory table on pension schemes in social insurance. For the benefit of users of the accounts, all countries will be expected to produce the new table. By systematically showing pension obligations for all schemes, the table increases the transparency of household and general government finance, allows a better comparison of pension data across countries and economic areas, and is particularly relevant in view of the far-reaching implications of population ageing in the euro area and many industrial economies.

18. Eurostat is developing the revised ESA; a draft chapter on pensions has already been made available. The key principles of the revised ESA are fully in line with 2008 SNA. It is suggested that the new table on pension schemes in social insurance should be compulsory for all EU countries through the new ESA regulation. It means that data have to be transmitted according to the new ESA transmission programme. In addition, the new ESA will contain some stricter criteria on the core/non-core recording of pension entitlements to ensure consistency across the European Union. This means that entitlements of government managed unfunded employment related pension schemes will only be recorded in the supplementary table. More guidance will also be given on key modelling issues, such as the

[4] See CMFB, Final Report of the Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government to the CMFB, 31 March 2008.

use of the ABO approach versus the PBO approach to treat future wage increases and the choice of the appropriate discount rate. There is the intention to draw up a compilation guide, which will contain further information on practical issues and assumptions.[5]

III. A comprehensive view on household pension entitlements under government schemes

A. Actuarial estimates of pension entitlements

19. All pension entitlements of households are assessed as part of the extended household balance sheet in the national accounts (showing assets and contingent assets) at a certain point in time, usually at the year-end. The pension entitlements under unfunded social insurance are recorded in gross terms, meaning that no accrued-to-date obligations of households reflecting future social contributions to finance the pension entitlements are taken into account; instead only the accrued-to-date pension entitlements for current and future pension benefits are covered, i.e. the pension entitlements accrued by current workers (including deferred pension entitlements) and the remaining pension entitlements of existing pensioners. As for all national accounts data, the data are measured ex post, as they include only the current values of the entitlements that arise from already accrued pension rights. The method is based on observable past events and transactions, such as membership of the pension scheme and contributions paid. However, these ex post measures also rely on some assumptions in the modelling process. The probability that current contributors may die or become disabled before reaching pensionable age needs to be estimated. The approach also covers future changes to the (defined) pension benefits owing to any legislation enacted prior to the year for which pension entitlements are calculated. Finally, the method requires assumptions about future developments, notably the development of the discount rate for future pension disbursements.

20. As with all other assets, the pension entitlements are entered into the extended household balance sheet at their value on the balance sheet date. Since actuarial values for pension entitlements related to unfunded social insurance in the euro area are typically not made available by the manager of the scheme, compilers of national accounts have to estimate the actuarial value.

21. The real discount rate applied has a relatively large impact on the overall amount estimated. Sensitivity analyses using several different discount rates (or discount rate differentials) are strongly recommended. Three choices may be considered for a discount rate to be applied to government-managed pension schemes: (i) a discount rate based on the yield on (central) government bonds; (ii) a discount rate based on the yield on high-quality corporate bonds; and (iii) a risk-free rate reflecting the time value of money. The preferred discount rate is the yield on central government bonds (or, exceptionally, high-quality corporate bonds). These should, ideally, have a residual maturity of the same order as the pension entitlements (e.g. 30 years, which corresponds to the average length of pension entitlement payments). Another important aspect is the assumption made about real wage growth used in the calculations of entitlements under defined-benefit pension schemes,

[5] The timetable for the revised ESA envisages: (a) until November 2009: drafting of chapters and comments of Member States; (b) December 2009 to June 2010: finalisation of the new ESA regulation and adoption of the Commission proposal; (c) 2012: adoption of the ESA regulation by the Council and the European Parliament; and (d) 2014: implementation of new ESA and transmission programme (back series will be needed, including for pensions).

where the level of pensions is determined by applying a formula to the member's salary (ABO versus PBO).

B. Measuring household pension entitlements

22. As recommended in the 2008 SNA, pension entitlements of households under government schemes can be recorded either as financial assets in the national accounts or as contingent assets.[6] Those treated as financial assets constitute financial claims that beneficiaries have vis-à-vis either their employer or a manager designated by the employer to pay pension benefits earned as part of a compensation agreement between the employer and the employee. Those treated as contingent assets usually represent "conditional claims" on unfunded pension schemes managed by general government, including social security schemes. For general government, they are recorded as contingent liabilities.

23. To obtain a complete picture of the pension entitlements of households in the euro area data on transactions and other economic flows in the course of 2007, as well as outstanding positions, in contingent pension entitlements were estimated under government schemes for end 2006 (the opening amounts) and for end 2007 (the closing amounts) with the assistance of the Task Force on Pensions.[7]

24. Table 2 provides an overview of these benchmark calculations, covering about 54 per cent of the government-managed unfunded defined-benefit schemes and 73 per cent of the social security schemes in 2007. According to these estimates, pension entitlements under government-managed unfunded defined-benefit schemes accounted for about 79 per cent and pension entitlements under social security schemes for 415 per cent of household GDI at the end of 2007. These results are broadly in line with the findings in the literature on estimating the size of accrued-to-date pension entitlements. Differences relate mainly to the reference year, the proportion of pension schemes included in the estimates, the denominator (household GDI in this case, but GDP in other studies), as well as methodological specifications that follow the new international standards, and macroeconomic assumptions. Moreover, the approach applied in this paper provides a coherent set of stock and flow data, as outlined in Table 2.

[6] As contingent assets and liabilities do not give rise to unconditional obligations either to make payments or to provide other objects of value, they are not recorded as financial assets and liabilities in the national accounts. For details, see paragraph 2.29 of the 2008 SNA.

[7] See also European Central Bank, Entitlements of households under government pension schemes in the euro area – results on the basis of the new System of National Accounts, Monthly Bulletin January 2010.

Table 2

Pension entitlements under government-managed pension schemes in the euro area

(percentages of annual household GDI in 2007, PBO approach)

Position	*Government-managed unfunded defined-benefit schemes*	*Social security pension schemes*
Pension entitlements (opening balance sheet)	77.4	406.0
Increase in pension entitlements due to social contributions	4.1	29.7
Other (actuarial) change of pension entitlements		-2.3
Reduction in pension entitlements due to payment of pension benefits	3.0	14.4
Changes in pension entitlements due to social contributions and pension benefits	1.1	13.1
Changes in pension entitlements due to pension reforms	-0.0	-4.1
Pension entitlements (closing balance sheet)	78.5	415.0
Memo: Pension entitlements (closing balance sheet) in EUR billions	*2,270*	*17,404*

Sources: ECB and Research Centre for Generational Contracts, Freiburg University.

25. In order to account for the uncertainty surrounding the actuarial estimates of contingent pension entitlements of euro area households, sensitivity analyses were carried out. The calculations shown in Table 3 are based on various model assumptions, with a baseline scenario assuming a long-term real discount rate of 3 per cent and an annual real wage growth of 1.5 per cent. To check the robustness of the results, the baseline assumptions were changed as indicated in the table and in the chart. For these calculations, the PBO approach was applied.

26. The impact of a change in the real discount rate on the amount of pension entitlements is substantially higher than that of changes in real wage growth. The calculations based on the PBO valuation lead to stocks of pension entitlements that are usually 10 per cent to 20 per cent higher than entitlements derived on the basis of the ABO approach. Moreover, the sensitivities in the case of applying the PBO approach are more pronounced than in that of used the ABO approach. Under realistic assumptions, accrued-to-date pension entitlements related to government-managed pension schemes amounted to between 430 per cent and 570 per cent of household GDI in the euro area at the end of 2007 (calculated as the sum of column G and column H).

27. Estimates of contingent pension entitlements have also been provided for France and Germany in recent years. The estimates for France, which were carried out by Insee, put implicit social security pension entitlements at 259 per cent of GDP in 2003. The figure is broadly in line with the results published in a study by the Banque de France, in cooperation with the US Bureau of Economic Analysis. According to the calculations undertaken for Germany by Destatis, social security pension entitlements amounted to about 230 per cent of GDP in 2005. The entitlements derived for social security schemes in these country studies compare well with the estimates provided for the euro area (278 per cent of GDP in 2007). Estimates for pension schemes established for civil servants have also been carried out in some country studies.[8]

[8] See D. Blanchet and S. Le Minez, "Assessing implicit pension liabilities for the French pension system: a micro-founded approach", a paper prepared for the 30th General Conference of the International Association for Research in Income and Wealth (IARIW), August 2008; D. Durant and M. Reinsdorf, "Implicit social security and pension wealth in households' assets in the US and

Table 3
Sensitivity analyses of household entitlements under government pension schemes in the euro area
(percentages of annual household GDI in 2007, PBO approach)

Schemes	*G*	*H*	*G*	*H*	*G*	*H*
Real discount rate as a percentage	Real wage growth rate as a percentage					
	1		1.5		2	
2.6	79.2	419.1	83.9	446.3	89.2	477.2
2.8	76.6	404.6	81.1	430.2	86.1	459.3
3.0	74.2	390.8	78.5	415.0	83.2	442.4
3.2	71.9	377.8	75.9	400.7	80.4	426.5
3.4	69.7	365.5	73.5	387.2	77.8	411.6

Sources: ECB and Research Centre for Generational Contracts, Freiburg University.
Notes: Sensitivity analysis based on varying the real discount rate and real wage growth; baseline scenario: a real discount rate of 3 per cent and real wage growth of 1.5 per cent G – Government-managed unfunded defined benefit schemes; H – Social security pension schemes.

28. Table 4 provides an overview of the results reported by Destatis, Insee and the European Commission (Eurostat)/ECB Task Force on Pensions. The United States Bureau of Economic Analysis has carried out similar actuarial calculations for private and government-managed defined-benefit schemes and for social security pension schemes in the United States.[9] Currently, both defined-benefit and defined-contribution schemes play important roles in financing retirement for households.[10] While government-managed unfunded defined-benefit schemes are virtually non-existent in the United States, pension entitlements from private defined-benefit pension schemes add the equivalent of about 80% of US household GDI to US household assets. Moreover, US households have social security pension entitlements of about 160% of household GDI.[11]

France", a paper prepared for the 30th General Conference of the IARIW, August 2008; and A. Braakmann, J. Grütz and T. Haug, "Das Renten- und Pensionsvermögen in den Volkswirtschaftlichen Gesamtrechnungen", Statistisches Bundesamt, Wirtschaft und Statistik 12/2007, pp. 1167-79.

9 See M. B. Reinsdorf and D. G. Lenze, "Defined benefit pensions and household income and wealth", Survey of Current Business, August 2009, and D. Durant and M. Reinsdorf, op. cit.

10 In the United States private sector, newly established pension schemes are almost always defined-contribution schemes. The number of private sector defined-benefit schemes is declining very slowly but remains above 40,000. The population covered is ageing rapidly, so that benefits are rising faster than contributions. Moreover, the United States also has over 2,500 defined-benefit pension schemes for employees of state and local governments, while the federal government manages about 40 defined-benefit schemes for its employees.

11 Social security is covered in the estimates for the United States. It is a social insurance programme, not a social assistance programme. It is not very different from social security in Europe, except that the benefits are generally lower relative to average earnings because of the expectation that the retiree will also have income from employer schemes or from individual insurance schemes.

Table 4

Accrued-to-date pension entitlements as compiled by Destatis, Insee and the European Commission (Eurostat)/ECB Task Force on Pe nsions

Source	*Destatis*	*Insee*	*European Comission (Eurostat)/ ECB Task Force on Pensions*	
Method	Accrued-to-date liabilities (PBO)	Accrued-to-date liabilities (PBO)	Accrued-to-date liabilities (PBO)	
Coverage	Social security	Social security	Social security	Defined-benefit schemes
End-year as % GDP	2005	2003	2007	2007
Germany	230	-	275	47
France	-	259	295	60
Euro-area	-	-	278	52

Sources: 1) A. Braakmann, J. Grütz and T. Haug, Das Renten- und Pensionsvermögen in den Volkswirtschaftlichen Gesamtrechnungen, Statistisches Bundesamt, Wirtschaft und Statistik 12/2007, pp. 1167-1179. 2) D. Blanchet and S. Le Minez, "Assessing implicit pension liabilities for the French pension system: a micro-founded approach", paper prepared for the 30th General Conference of the International Association for Research in Income and Wealth (IARIW), August 2008.

C. Recording of household assets and contingent pension entitlements

29. The data provided in balance sheets for the euro area and in these preliminary compilations allow a more comprehensive picture of household assets – including household contingent pension assets – and liabilities, to be drawn. Household wealth is broken down into non-financial assets (housing) and financial assets.

30. Table 5 illustrates that household assets in the euro area (excluding contingent pension entitlements) were more than seven times higher than annual household GDI at the end of 2007; the same calculation for the United States shows that household entitlements were more than eight times higher than annual household GDI. Contingent pension entitlements of households in the euro area are larger than those in the United States - at approximately five times and two times annual household GDI respectively. There are practically no pension entitlements recorded under United States government-managed unfunded defined-benefit schemes, but many under social security pension schemes.

Table 5

Household assets, liabilities, net worth and contingent pension entitlements in the euro area and the United States

(multiples of household GDI, end-2007)

Item	*Euro area*	*United States*
Assets	**7.3**	**8.3**
Non-financial assets	4.4	2.8
Financial assets	3.0	5.5
Of which:		
Life insurance and pension assets (as currently reported)	0.8	1.3
Of which:		
Pension entitlements under private defined-benefit schemes[1])	.	0.8
Liabilities	**0.9**	**1.4**
Net worth (assets minus liabilities)	**6.4**	**6.9**
Memo items:		
Contingent pension entitlements	*4.9*	*1.6*
Under government-managed defined-benefit schemes[2])	*0.8*	*0.0[3])*
Under social security pension schemes	*4.2*	*1.6[4])*

Sources: ECB, European Commission (Eurostat), Research Centre for Generational Contracts, Freiburg University, US Bureau of Economic Analysis and US Federal Reserve Board.

[1]) For the euro area, data are not yet available; for the United States, data refer to end-2006. [2]) Government-managed defined-benefit schemes are predominantly unfunded in the euro area, but are predominantly funded in the United States. [3]) Government-managed unfunded defined-benefit schemes are practically non-existent in the United States although the pre-1983 federal government scheme was unfunded and still support many retirees. [4]) US households have contingent social security pension entitlements.

IV. Recording of general government pension obligations

31. From the figures shown in Table 5 information can be derived on government pension obligations arising from government-managed pension schemes at the end of 2007. Table 6 provides an overview of gross government debt in the euro area and in the United States as conventionally measured. It shows that government debt was between 60 per cent and 70 per cent of GDP. However, contingent pension obligations of general government in the euro area were more than five times higher than gross government debt at the end of 2007. The associated increase in government obligations is less significant in the United States.[12]

32. The calculations presented above may have substantial implications for future rates of benefits, taxes and social contributions. Reforms of government-managed pension schemes are on the agenda of most governments in the euro area as these schemes are far

[12] It has to be kept in mind that a gross concept has been followed as future social contributions and taxes paid by households are not taken into account. Doing so and also taking into account future pension payments would lead to a sustainability indicator as a balancing item by subtracting, in the context of an open system, future social contributions and taxes from pension obligations. In general, future social contributions and taxes do not have to equal future pension payments if these are calculated according to the rules of a scheme that is not sustainable or if the social security scheme has already accumulated a large stock of assets to be used for future benefits. In any case, the balancing item is usually much smaller than the government pension obligations as shown gross in Table 5.

more strongly affected by demographic changes than defined-contribution pension schemes. A demographic change that reduces the number of contributors relative to the beneficiaries will require a reduction of average pension benefits if contribution rates are to remain constant. Alternatively, for constant pension benefits, contribution rates (or tax payments) would have to be increased. To avoid an unbalanced burden either on beneficiaries or on contributors, different strategies of pension reform are typically considered.

Table 6

General government debt and contingent pension obligations in the euro area and in the US

Multiples of annual gross domestic product (GDP), end-2007

Item	*Euro area*	*United States*
Maastricht debt	**0.7**	**0.6**[1])
Contingent pension obligations	***3.3***	***1.1***
Government-managed defined-benefit schemes[2]*)*	*0.5*	*0.0*[3]*)*
Social security pension schemes	*2.8*	*1.1*[4]*)*
Debt including contingent pension obligations	*4.0*	*1.7*

Sources: ECB, European Commission (Eurostat), Research Centre for Generational Contracts, Freiburg University, US Bureau of Economic Analysis and Federal Reserve Board.

1) Currency and deposits, loans and debt securities incurred by general government (consolidated). *2)* Government-managed defined-benefit schemes are predominantly unfunded in the euro area, but are predominantly funded in the United States. *3)* Government-managed unfunded defined-benefit schemes are practically non-existent in the United States .*4)* United States households have contingent social security pension entitlements.

33. Reforms may take the form of adjusting the existing scheme arrangements with regard to the level of pension benefits and social contributions (parametric reforms). Alternatively, fundamental changes may be made to the structure of the financing of pension benefits (systemic reforms). They may be carried out by setting up a new scheme for new contributions or new contributors, while largely maintaining the current scheme for accrued entitlements. Policy simulations based on pension models are useful for broadly assessing the impact of parametric pension reforms by modifying parameters and input data for existing schemes. In this context, several important determining factors of the accrued pension entitlements can be identified. The levels of pension benefits actually paid are regarded as quite important as they are a direct determinant of the stock of pension entitlements. The retirement age is an additional determining factor. Other factors are the indexation of pension benefits, as well as reductions in future pension benefits on account of pension reforms already enacted.

34. According to policy simulations, the impact of raising the effective retirement age for the euro area by one year would lower pension entitlements by 2.7 per cent and by 5.2 per cent of GDP if it is increased by two years (relative to the baseline scenario shown in Table 6). A further aspect to be considered when modelling such an increase in the retirement age is that the outcome of the reform depends also on the behavioural assumptions regarding new beneficiaries with respect to changes in the retirement age, the penalty for early retirement and legislation on, for example, granting disability benefits.

V. Accrued-to-date pension entitlements and sustainability measures

35. In April 2009 the Ecofin Council of the European Union endorsed the 2009 Ageing Report for the EU-27 Member States (2008-2060), which had been prepared by the European Commission and the Economic Policy Committee (EPC) on the basis of commonly agreed demographic and macroeconomic assumptions.[13] The concept of implicit pension liabilities, as applied in the Ageing Report, differs from that of estimating accrued-to-date entitlements in the national accounts as it projects total age-related government expenditure including pensions over a long horizon. Accrued-to-date pension entitlements are compiled ex post, i.e., on the basis of a national accounts concept, by taking into consideration all "claims" accrued by current workers and the remaining pension entitlements of existing pensioners. In this respect, they are only a sub-set of implicit pension liabilities.

36. Generally speaking, future pension payments can be divided into four groups: (a) for each year, pensions have to be paid to people who have already retired today. Given the mortality of pensioners, this group of payments is expected to progressively decline in importance and will become zero upon the death of the last people who have already retired today; (b) pensions have to be paid in future to people working today, in relation to the entitlements they have already acquired up to the present moment. This share of payments will increase for several years, as people currently working will progressively retire; it will then decrease in line with mortality; (c) pensions have to be paid to people already in the labour market, in relation to the entitlements they will accumulate from the present moment until their retirement; and (d) pensions have to be paid in the distant future to people who are not yet in the labour market, some of whom are yet to be born.

37. Accrued-to-date pension entitlements as measured in national accounts, correspond to (a) and (b) if account is taken of the necessary modelling assumptions such as the discount rate or wage growth. The concept that is relevant for assessing sustainability, by contrast, corresponds to (a) to (d), together with the related government revenues. Both concepts are linked to each other in the sense that implicit pension liabilities are also derived by making corresponding assumptions related to the discount rate and other parameters of pension models.

38. Accrued-to-date pension entitlements are based on a backward-looking actuarial estimation, even though the estimation requires projections on the future development of interest rates, wages and the population. By contrast, implicit pension liabilities are a forward-looking concept based on a broader set of projections, and they are set to be used in the EU's new medium-term budgetary objectives. For reasons of consistency, it is appropriate to harmonise the data input for calculations of accrued-to-date contingent pension entitlements and also for projections of government pension expenditure.

39. In practice, there are cases in which the results derived for accrued-to-date pension entitlements and for implicit pension liabilities appear to point in different directions. There are countries that have large accrued-to-date contingent pension entitlements, but their implicit pension liabilities are not expected to increase in the future. These countries have mature pension systems, so that large accrued-to-date contingent pension entitlements have been accumulated over time. On account of both demographic developments and the design of the pension system, however, future pension expenditures are not under strain. On the

[13] European Commission (DG ECFIN) and the Economic Policy Committee, "2009 Ageing Report: economic and budgetary projections for the EU-27 Member States (2008-2060)", European Economy, No 2, 2009.

other hand, there are also countries that have small accrued-to-date contingent pension entitlements, but their implicit pension liabilities are expected to increase in the future. These are typically countries that have a new pension system, so that the accrued-to-date contingent pension entitlements are still small. These countries will have obligations for the future pensioners in the future, and these are reflected in their implicit pension liabilities.

VI. Conclusions

40. As described in the note, the 2008 SNA foresees supplementary data on pension entitlements of households under government pension schemes, as will the ESA, which is currently being revised. Following this approach, the *Task Force on Pensions* has already undertaken preparatory work to provide estimates of these pension entitlements under unfunded defined-benefit schemes managed by government and under social security schemes. In the absence of data from other sources or reporting agents, the national statistical institutes have carried out these estimates in cooperation with other national agencies. This was a rather new and challenging task, requiring extensive experience in actuarial finance.

41. The data compiled in accordance with the new, globally agreed and harmonised methodology confirm that accrued-to-date contingent pension entitlements are very significant in the euro area, even exceeding the portfolio of all financial assets or that of non-financial assets owned by households. They total approximately 490 per cent of household annual gross disposable income (or 330 per cent of GDP). In terms of government obligations, they are about five times higher than government debt. The results are in line with those of earlier studies reviewed by the World Bank for a wide range of countries, including several euro area countries.

VI. References

Blanchet, D. and S. Le Minez, *Assessing implicit pension liabilities for the French pension system: a micro-founded approach*, paper prepared for the 30th General Conference of the International Association for Research in Income and Wealth (IARIW), August 2008

Braakmann, A., J. Grütz and T. Haug, *Das Renten- und Pensionsvermögen in den Volkswirtschaftlichen Gesamtrechnungen*, Statistisches Bundesamt, Wirtschaft und Statistik 12/2007, pp. 1167-79

Committee on Monetary, Financial and Balance of Payments Statistics (CMFB), *Final Report of the Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government to the CMFB*, 31 March 2008

Durant, D. and M. Reinsdorf, *Implicit social security and pension wealth in households' assets in the US and France*, paper prepared for the 30th General Conference of the IARIW, August 2008

European Central Bank, *Entitlements of households under government pension schemes in the euro area – results on the basis of the new System of National Accounts*, Monthly Bulletin January 2010

Council Regulation (EC) No. 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community" (ESA95), Brussels, 25 June 1996

European Commission (DG ECFIN) and the Economic Policy Committee, *2009 Ageing Report: economic and budgetary projections for the EU-27 Member States (2008-2060)*, European Economy, No 2, 2009

Holzmann, R., P. Palacios and A. Zviniene, *On the economics and scope of implicit pension debt: an international perspective*, Empirica, No 28, 2001, pp. 97-129

Mink, R., M. Rodriguez, E. Barredo and J. Verrinder, *Reflecting pensions in National Accounts -Work of the Eurostat/ECB Task Force*, paper prepared for the 30th General Conference of the IARIW, August 2008

Mink, R. and P. Rother, *The statistical recording of implicit pension liabilities and its impact on household wealth and general government obligations,* IFC Bulletin No 25, March 2007

Müller, C., B. Raffelhueschen and O. Weddige, *Measuring pension liabilities and the perspective of sustainability: the case of the reformed German statutory pension scheme*, Discussion Paper No 39, Research Centre for Generational Contracts, Freiburg University, September 2009

Reinsdorf, M.B. and D.G. Lenze, *Defined benefit pensions and household income and wealth*, Survey of Current Business, August 2009

Statistical Office of the European Commission (Eurostat), the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Statistics Division and regional commissions of the United Nations, Secretariat and the World Bank, *System of National Accounts, 2008 (2008 SNA)*, available at the website of the United Nations Statistics Division (http://unstats.un.org/unsd/sna1993/snarev1.asp)