General government pension obligations in Europe

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1. Introduction

The population of Europe is ageing. This is not a new phenomenon, but a process common to almost all developed, and most developing, countries. At the beginning of the twentieth century, barely one in ten citizens living in Europe was over the age of 65, compared to more than two out of every ten today. Although population ageing is likely to accelerate over the next 50 years, with three out of ten people being over 65 by 2050, we should recognise that this represents the continuation of a long-term trend rather than an abrupt break with the past.[2]

This ageing process is driven essentially by two separate forces: (i) increasing longevity; and (ii) women's decreasing fertility. Having increased by eight years since 1960, *life expectancy at birth* is projected to rise in the euro area by a further six years for males and five years for females by 2050, with most gains resulting from lower mortality rates at older ages. However, the low *fertility rates* are generally regarded as the main factor in the ageing of the population. In all euro area countries, fertility rates are below the natural replacement ratio (approximately 2.1 children per woman) at which the size and age structure of the population remain stable.

Section two of this paper describes the ageing of the population in Europe and its economic consequences. In section three, it further analyses the economic consequences in relation to the increase in future pension obligations incurred by general government. Such implicit pension obligations are accumulated predominantly by general government-sponsored employer pension schemes and social security pension funds, which are usually organised on the pay-as-you-go principle, whereby current contributions finance current benefits. So far, no obligations have been recorded for such schemes in government finance statistics or in national accounts. However, progress has been made towards recording such pension obligations in the system of national accounts. These new developments are discussed in section four, while section five describes some issues related to the measurement of implicit pension obligations.

2. Ageing in Europe and its economic consequences

Given the overall demographic trends, Eurostat projects, for instance, that Germany's population will shrink from 83 million people to just 78 million, and Italy's from 58 million to 54 million (see Table 1).

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[2] The forecasts are part of the report on *The impact of ageing on public expenditure*, published by the European Commission in 2006.

Table 1

Demographic projections for the euro area, the UK and the US

	Population (millions)			Working age population, 15–64 years (millions)			Retirement age population, 65+ years (millions)			Number of workers supporting each retiree		
	2005	**2050**	**change**	**2005**	**2050**	**change**	**2005**	**2050**	**change**	**2005**	**2050**	**change**
Belgium	10	11	4	7	6	–8	2	3	65	3.8	2.1	–1.7
Germany	83	78	–6	56	45	–19	15	23	51	3.7	1.9	–1.8
Greece	11	11	–4	8	6	–22	2	4	76	3.8	1.7	–2.1
Spain	43	43	0	29	23	–22	7	15	109	4.1	1.5	–2.5
France	60	65	8	39	37	–5	10	17	74	4.0	2.2	–1.8
Ireland	4	6	34	3	3	14	1	1	214	6.1	2.2	–3.9
Italy	58	54	–7	39	29	–24	11	18	61	3.5	1.6	–1.9
Luxembourg	1	1	42	0	0	10	0	0	87	4.8	2.8	–2.0
Netherlands	16	18	8	11	11	–4	2	4	88	4.9	2.5	–2.4
Austria	8	8	1	6	5	–14	1	3	90	4.4	1.9	–2.5
Portugal	11	10	–4	7	6	–22	2	3	82	4.0	1.7	–2.3
Finland	5	5	0	4	3	–13	1	1	71	4.3	2.1	–2.1
Slovenia	2	2	–5	1	1	–24	0	0	97	4.7	1.8	–2.9
Euro area	**310**	**308**	**–1**	**208**	**174**	**–16**	**54**	**94**	**72**	**3.7**	**1.9**	**–2.0**
UK	60	64	7	40	38	–4	10	17	65	4.1	2.2	–1.9
United States	*298*	*395*	*32*	*200*	*245*	*23*	*37*	*82*	*122*	*5.4*	*3.0*	*–2.4*

Source: European Commission, *The impact of ageing on public expenditure*, 2006.

For several European countries, slight population increases are also forecast, suggesting that the euro area population will start to shrink in absolute terms in about 20 years, though remaining nearly unchanged in 2050. The old age dependency ratio will have reached almost 55% at that time, however, as compared with 27% in 2005 – a situation that will contribute to destabilising the age structure. In contrast, the US population is projected to increase from 300 million to nearly 400 million people over the same period of time.

Ageing in Europe will have important economic consequences. The "slow burn" nature of the demographic changes implies that their immediate effects are likely to be moderate. The effects include changes in the size and composition of labour supply, as the proportion of older workers increases and fewer new workers enter the labour market to replace those leaving it. Under the assumption of unchanged labour utilisation and labour productivity growth, demographic trends imply a decline in real GDP growth from its average 1995–2005 level of 2.1% to around 1% by 2050. Real GDP-per-capita growth will also decline.

3. Impact of ageing in Europe on general government pension obligations

Population ageing will also put acute pressure on general government financing, by driving ageing-related expenditure, as the ratio of pension recipients to pension contributors will rise. In this context, the new Code of Conduct of the European Stability and Growth Pact incorporates guidelines on national strategies to ensure the sustainability of government finances, especially in the light of the economic and budgetary impact of ageing populations.

The most important data set, at present, concerns the results of long-term budgetary projections for all EU Member States' expenditures for pensions, health care, long-term care, education, and unemployment transfers during the 2005–2050 period, as presented in the Commission study mentioned above. Concerns about this are spreading, based on a growing recognition amongst policy-makers that ageing populations will constitute major economic, social and budgetary challenges for the European economies in the coming decades.[3]

According to these projections, the ageing of Europe's societies will impose extra costs. The Commission study calculates that, absent any reform, the demographic change will cause a cumulative increase of more than 3 percentage points in pension expenditures, as a percentage of GDP, for most euro area countries. For the euro area as a whole, the expenditure will increase by 2.6% of GDP, reaching 14.1 % of GDP in 2050.

Increasing pension expenditures have an adverse impact on the pension obligations incurred by general government, especially in Europe. General governments manage pension schemes for large portions of the population, usually based on the pay-as-you-go principle. All euro area countries except the Netherlands, have pension schemes sponsored by general government in the form of social security pensions or defined benefit employer pension plans (eg those for civil servants).

Estimates in the literature highlight the importance of general government pension obligations. Studies conducted ten years ago using the accrued-to-date liabilities concept found general government pension obligations ranging from 70% of GDP for the United Kingdom to 350% of

[3] European Central Bank, Demographic change in the euro area: projections and consequences, Monthly Bulletin, October 2006.

GDP for Italy.[4] While different methodologies and assumptions, notably with regard to discount rates, have a very sizeable impact on the results, the estimates show that these pension obligations generally exceed the stock of outstanding general government debt.

The Commission study points to ageing-induced fiscal burdens equal to an increase of infinite-horizon budgetary cost of more than 4% of GDP for over half of the euro area countries, reaching around 8% for some countries. The conversion of these flow data into a net present value at a discount rate of 5% yields burdens for the euro area of 174% of GDP in 2005. A lower discount rate of 3% increases this figure even further, to 217% of GDP (Table 2).

Table 2

General government pension expenditure and estimated implicit pension obligations

As a percentage of GDP

Country/area	General government pension expenditures			Estimated implicit general government pension obligations[1]					
				Discount rate 5% p.a.			Discount rate 3% p.a.		
	2005	2050	Change (p.p.)	2005	2050	Change (p.p.)	2005	2050	Change (p.p.)
Belgium	10.4	15.5	+5.1	165	201	+35	208	253	+45
Germany	11.1	13.1	+2.0	166	181	+16	207	228	+21
Greece	–	–	–	–	–	–	–	–	–
Spain	8.7	15.7	+7.0	147	194	+47	186	246	+60
France	12.8	14.8	+2.0	190	206	+16	237	259	+22
Ireland	4.6	11.1	+6.5	87	129	+42	110	164	+54
Italy	14.3	14.7	+0.4	207	213	+6	257	267	+10
Luxembourg	10.0	17.4	+7.4	167	217	+50	211	274	+64
Netherlands	7.4	11.2	+3.5	118	144	+26	149	182	+34
Austria	13.2	12.2	–1.0	187	184	–3	232	230	–2
Portugal	11.5	20.8	+9.3	195	257	+62	246	325	+80
Finland	10.4	13.7	+3.3	160	184	+24	200	231	+31
Slovenia	11.0	19.3	+8.3	181	230	+49	228	291	+63
Euro area	**11.5**	**14.1**	**+2.6**	**174**	**193**	**+20**	**217**	**243**	**+26**
UK	*6.7*	*8.6*	*+1.9*	*102*	*116*	*+14*	*128*	*146*	*+18*
United States	***4.7***	***6.5***	***+1.8***	***68***	***70***	***+2***	***85***	***88***	***+3***

[1] Pension obligations approximated by discounting expected future pension expenditures (with discount rates of 5% and 3% p.a.) under a no–policy–change assumption. See European Commission, *The impact of ageing on public expenditure*, 2006. For the United States, the estimates are based on data for old–age, survivors', and disability insurance benefits and veterans' benefits from government as components of personal income (see www.bea.gov).

Source: European Commission (2006), BEA and author's estimates.

[4] R. Holzmann (2004), World Bank Social Protection Discussion Paper No. 403; R. Holzmann, R. Palacios and A. Zviniene (2004): Implicit Pension Debt: Issues, Measurement and Scope in International Perspective, Washington, D.C.

It should be noted that given the somewhat optimistic assumptions of these calculations regarding labour market developments, the actual burdens could be even higher. Furthermore, these estimates are derived from current and future pension expenditure data, which are not a very reliable predictor of pension obligations. Moreover, other factors, such as the "maturity" status of pension schemes, are equally important. Besides maturity, different demographic ageing patterns may affect results. Other things being equal, a higher old-age dependency ratio increases both pension obligations and expenditure ratios, but differences in future dependency ratios impact pension obligations before translating into higher pension expenditure ratios. Such factors have to be taken into account to appropriately measure pension obligations, as described in section 5.

4. Progress achieved on the method for recording general government pension obligations

The 1993 SNA recognises implicit (unfunded) pension liabilities neither as general government or corporate liabilities, nor as financial assets of households. This is due to the fact that such obligations are not viewed as liabilities in a strict sense, since they can be altered unilaterally at any time. Furthermore, their estimation is highly dependent on a series of assumptions, which are subject to major revisions. Since the liabilities of the schemes are not recorded in the 1993 SNA, their impact on the sector's net lending/net borrowing, as reflected in the SNA, is determined only by the amount paid in pensions to retired employees minus current employee contributions. However, to increase comparability between schemes that record pension liabilities and those that do not, the 1993 SNA proposes to show, as memorandum items, the net present value of such obligations in the form of assets of households and liabilities of the scheme. The IMF's Government Finance Statistics Manual (GFSM 2001) even recommends explicitly recording the liabilities of unfunded government employer pension schemes in the government accounts, but not the liabilities of social security pension funds.[5]

The future treatment of unfunded employer pension schemes sponsored by general government in the new SNA was especially controversial, and revealed major differences of opinion worldwide. The UN Statistical Commission, at its March 2006 meeting, took note of this issue, indicating the need for further consultation, and expressed optimism about finding a solution. Intense discussions followed, especially in Europe. A compromise emerged from the IMF's response, on behalf of the Inter-Secretariat Working Group on National Accounts (ISWGNA), to comments on pensions made by the ECB, and from a September 2006 meeting of the newly established *Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government*. The proposed compromise was circulated in October 2006, for worldwide consultation, to the ISWGNA, as well as to the Advisory Expert Group on National Accounts (AEG). This process led to its approval by the UN Statistical Commission in February/March 2007.

In essence, there is now consensus on distinguishing between pension schemes sponsored by general government, which should be recorded in the core national accounts, and schemes that should be recorded only in a supplementary table on pensions. The updated SNA will include such a new mandatory table showing all flows and stocks of all pension schemes. For the benefit of users of the accounts, all countries will be expected to produce the new table, and it was suggested that this table would be compulsory for all European

[5] R. Mink 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.

Union Member States, through the ESA regulation that is due to be revised in the coming years.

According to this compromise, it was agreed that (implicit) pension liabilities of social security pension funds will be recorded only in the proposed supplementary table on pension schemes, and not in the core national accounts. The recommendation of the updated SNA regarding the recording of unfunded pension schemes sponsored by general government for all employees (whether private sector employees or government employees) will be flexible. Given countries' different institutional arrangements, the updated SNA will permit countries to opt for recording only a portion of these pension entitlements in the core national accounts. However, they will be required to provide the rationale and criteria for the distinction between those schemes whose entitlements are carried forward to the core accounts and those whose entitlements are recorded only in the supplementary table. The provision of a set of internationally recognised criteria for this distinction has already been placed on the SNA research agenda, and will also be considered during the revision of the ESA.

Recent work at the Eurostat/ECB Task Force has concentrated on the design of the supplementary table for social insurance pension schemes (Table 3). The overall logic of the table is to present the opening and closing stocks of pension entitlements *for all social insurance pension schemes* (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, thus systematically showing *pension obligations* for all of these schemes. This will facilitate international comparability. It is not intended to include social assistance schemes, though the Task Force was concerned that the current definition of social assistance may not be adequate to deal satisfactorily with all observed cases.

The *columns* of the table are first divided by pension schemes, classified as being either in the core national accounts or not in the core national accounts. Under the compromise, the pension entitlements of all pension schemes sponsored by the private sector are recorded in the core accounts, and only schemes sponsored by general government (ie for government employees) may or may not be recorded as such in the core accounts, thus appearing as separate categories in this supplementary table.[6] Second, the pension schemes classified within the core national accounts are either "sponsored" by a non-general government unit or by a general government unit. Third, the employer pension schemes are further split into defined benefit schemes and defined contribution schemes. The *rows* of the table relate to positions, transactions and other economic flows associated with pension entitlements of schemes included in the table.

One of the main functions of the supplementary table is to provide users with a comprehensive and consistent set of statistical data to facilitate compilation of various alternative key macroeconomic variables such as household wealth, excluding or including (implicit) pension entitlements, savings ratios or general government deficit or debt, excluding or including the impact of (implicit) pension obligations. It also provides information on countries' different institutional arrangements concerning the structure of pension schemes, and explains the distinction between those schemes carried forward to the core national accounts and those recorded only in the supplementary table.

[6] National accounts data for social security pension funds will be recorded only in the supplementary table.

Table 3

A supplementary table on social insurance pension schemes

Core/non-core national accounts		Total	Core						Non-core		Counter-parts:[4] Of which: Non-resident households
Sponsor			Non-general government				General government				
Scheme / Position/transaction/other flow			Total	DC schemes	DB schemes and other non-DC schemes[1]	DC schemes	DB schemes[2]	Of which: Classified in general government[3]		Social security pension funds	
#		A	B	C	D	E	F	G	H	I	J
Opening balance sheet											
1	Pension entitlements										
Transactions											
2	Social contributions relating to pension schemes										
	Employer actual social contributions										
	Employer imputed social contributions										
	Employee actual social contributions										
	Employee imputed social contributions/ property income										
	Self employed and non-employed social contributions										
3	Other (actuarial) accumulations of pension entitlements in social security funds										
4	Pension benefits										

For footnotes, see the end of the table.

Table 3 (cont)

A supplementary table on social insurance pension schemes

Core/non-core national accounts		Total	Core						Non-core		Counter-parts:[4] Of which: Non-resident households
Sponsor			Non-general government				General government				
Scheme / Position/transaction/other flow			Total	DC schemes	DB schemes and other non-DC schemes[1]	DC schemes	DB schemes[2]	Of which: Classified in general government[3]		Social security pension funds	
#		A	B	C	D	E	F	G	H	I	J
5	Change in pension entitlements (rows 2 + 3 – 4)										
6	Changes in pension entitlements due to transfers of entitlements										
Other economic flows											
7	Revaluations[5]										
8	Other changes in volume[5]										
Closing balance sheet											
9	Pension entitlements (rows 1 + 5 + 6 + 7 + 8)										
Related indicators											
	Output										
	Assets held by households[6]										

DB – defined benefit; DC – defined contribution.

[1] Such other non-DC schemes, often described as hybrid schemes, have both a DB and a DC element. [2] Schemes organised for general government employees. [3] These are non-autonomous DB schemes recorded in the core accounts. [4] Counterpart data for non-resident households will only be shown separately when pension relationships with the rest of the world are significant. [5] A more detailed split of these positions should be provided for columns H and I based on the model calculations carried out for these schemes. [6] These assets do not include people's pension entitlements or equity from pension schemes.

Source: CMFB Report on Pensions, February 2008 and draft 2008 SNA chapter 17, section on pensions.

5. Measurement of general government pension obligations in Europe

To compile this table, harmonised actuarial compilation methods and data sets will have to be provided. Such statistical work is being undertaken by the Eurostat/ECB Task Force for all EU countries. Two interrelated issues are being investigated: (i) further analysis of the measurement of (implicit) pension obligations for pension schemes sponsored by general government as an input for the new SNA; and (ii) an assessment of the sources and methods for measuring these obligations on a harmonised basis for all EU countries.

The statistical recording of the implicit general government pension obligations in the supplementary table requires that models be used to estimate the outstanding stocks and changes in stocks. In the pension literature, three alternative concepts of (implicit) pension obligations have been proposed, based on the differing scope of obligations included in the estimation: the accrued-to-date liability concept, the projected current worker's and pensioner's liability concept, and the open system liability concept. The usefulness of a particular definition depends on the specific purpose of the estimation. For example, an assessment of the long-term sustainability of current pension arrangements should use the broadest possible estimate of liabilities as a baseline. This suggests using open system liabilities. By contrast, policy questions concerning the possible termination of an operating pay-as-you-go pension system should be addressed on the basis of the first or the second concept, depending on the system's remaining time horizon.

From a statistical perspective, only the *accrued-to-date liability concept* is appropriate for national accounts purposes. It includes in the estimate the present value of liabilities arising from already accrued pension rights. This covers, for example, pension entitlements due to pension contributions already paid by current workers and remaining pension entitlements of existing pensioners. The method is based on observable past events and transactions, such as membership in the pension system, and paid contributions. However, probabilities that current contributors may die or become disabled before reaching the pensionable age need to be estimated. It also covers future changes of the payment stream due to any legislation enacted prior to the year for which (implicit) pension obligations are being calculated. Minimising the role of assumptions on the expenditure side is another reason for using the accrued-to-date-liability concept. Nevertheless, this method also requires some heroic assumptions on future developments, notably regarding the discount rate for future pension disbursements.

For the derivation of actuarial estimates under the accrued-to-date concept, two main valuation approaches have been applied to private pension schemes: the projected benefit obligation (PBO) method and the accrued benefit obligation (ABO) method. The ABO is calculated based on years of service to date and current wage and salary rates, ie future salary increases are disregarded. By contrast, the PBO is calculated including assumptions on employees' career earnings. The PBO exceeds the ABO, with a substantial difference in early years but decreasing towards retirement date. The two methods are neutral in terms of transaction totals, but have different patterns in terms of the time of recording.

While country-specific pension models allow many details of pension schemes to be specified, they lack the common structure – and, often, the common assumptions – for cross-country comparisons. On the other hand, cross-country estimates of pension obligations, to date, have had to rely on stylised presentations of the pension scheme(s) under investigation, rendering the results insensitive to country particularities. Thus, the same model should be used to produce comparable estimates for different countries.

Accordingly, initial model calculations for the compilation of the (implicit) pension obligations of general government-sponsored pension schemes in the euro area have been carried out using the World Bank's "Pension Reform Options Simulation Toolkit" (PROST) computer model, and with the model developed by Freiburg University. Both models are flexible

enough to incorporate most of each country's idiosyncratic pension system features, but also impose a common structure on all countries' pension schemes in the analyses. Wage growth and discount rate assumptions are two important factors in the estimates of implicit pension obligations. Discount rates could vary between two and five percent per annum.[7] Using a higher discount rate clearly reduces the estimated pension obligations. Real versus nominal wage growth is also significant where benefits are price-indexed. Countries differ in their legal indexation rules, and actual implementation often deviates from the rules. The Task Force also plans to collect the estimates based on national pension models and compare them with the results derived from the two models mentioned above.

6. Conclusions

From a user's point of view, there is a need for statisticians and national accountants to provide comprehensive data on pension obligations, especially those of general government, and they should be compiled based on SNA standards. This means no change in current standards for the treatment of pension schemes in the core accounts. As discussed, however, there are plans to compile a supplementary table on pensions, covering the details of pension flows and stocks recorded in the core national accounts, but also including those that are not covered. Thus, a complete view of household pension "assets" will be provided.

It is obvious that the ageing of the population in Europe makes structural reforms necessary. In this context, the financing of future pension expenditures and pension entitlements may need to be reviewed. The new supplementary table on all social insurance pension schemes will provide better information, and will allow consistent comparisons between private and general government pension schemes, as well as coherent assessments of policy adjustments. The table will also show that the predominant, general government-sponsored (unfunded, defined benefit) pension schemes in Europe will lead to increasing general government expenditure and debt if no structural reforms take place.

Policy solutions aside, implicit general government obligations from pension systems are very large for many European countries. The consequences for countries differ, mainly reflecting different demographic prospects and pension arrangements. The order of magnitude of upcoming fiscal burdens is high, even if estimates are sensitive to underlying assumptions on factors such as discount rate and wage growth. From a methodological perspective, estimating general government pension obligations generally requires detailed country-specific data on contribution and benefit arrangements. Therefore, ongoing work is being conducted to generate consistent estimates and, based on these data, homogeneous projections for a large set of countries.

References

[1] "Demographic change in the euro area: projections and consequences", ECB, Monthly Bulletin, October 2006.

[2] "The impact of ageing on public expenditure", European Commission, 2006.

[7] Thus, under the 2 percent discount rate assumption, wage growth and discount rate are the same. This may be considered to represent the rough upper boundary of any estimated implicit general government pension obligations. Discount rates of 3, 4 and 5 percent represent discount rate-wage indexation differentials of 1, 2 and 3 percent, respectively.

[3] “World Bank Social Protection Discussion Paper No. 403”, Holzmann, R., Washington, D.C., 2004.

[4] “Implicit Pension Debt: Issues, Measurement and Scope in International Perspective”, Holzmann, R., Palacios, R. and Zviniene, A., Washington, D.C., 2004.

[5] “The statistical recording of implicit pension liabilities and its impact on household wealth and general government obligations”, Mink, R. and Rother, R., IFC Bulletin No 25, March 2007.

[6] Draft chapter 17 of the revised System of National Accounts (2008 SNA). http://unstats.un.org/unsd/sna1993/draftingPhase/ChapterIssueMatrix.asp

[7] “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.

[8] “CMFB Report on Pensions”, February 2008.