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**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**

Background document to AEG paper SNA/M1.08/03: Pensions

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**Luxembourg, 31 January and 1 February 2008**

**PART A – ITEMS FOR DISCUSSION**

Item A.6.1 of the agenda

**PUBLIC FINANCE STATISTICS**

**Statistical contribution to the review of the sustainability of public finances  
– Final report from Task Force on the statistical measurement of the assets  
and liabilities of pension schemes in general government  
(Eurostat/ECB DG-S)**



Directorate C: National and European Accounts  
**Unit C-5: Validation of public accounts**



EUROPEAN CENTRAL BANK  
DIRECTORATE GENERAL STATISTICS

Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government

# **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**

**Luxembourg, 31 January and 1 February 2008**

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## **Executive summary**

The *Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government* was established and its *mandate* was agreed by the CMFB in its June 2006 meeting. The mandate foresees that the Task Force should review existing material on the measurement of pension schemes and social security classified in the general government sector; identify, discuss and reach an agreement on the statistical methodological issues which would need to be resolved to produce best possible estimates of these assets and liabilities; produce statistical estimates of the appropriate stocks and flows relating to these financial assets and liabilities, based on national accounting principles; and elaborate a methodological guidance note which could be used in non-Task Force countries for the purposes of preparing the best possible estimates of these assets and liabilities.

The Task Force has met six times since September 2006 with experts from the following countries and international organisations participating: Czech Republic, Germany, Spain, France, Italy, Hungary, the Netherlands, Poland, Finland, Sweden, the United Kingdom, DG ECFIN, the IMF, the OECD and the SNA Editor. It was intended to conclude the work by 1 May 2007. However, due to the complexity of the issues the CMFB agreed to extend the timetable of the Task Force up to end 2007. The Task Force discussed many aspects of the recording of pension schemes in national accounts, and these are summarised under the headings of methodological and empirical work below.

### **Methodological work (section three of the report)**

With respect to *the methodological work*, the Task Force has developed, and taken forward, an international compromise on the treatment of pension schemes in the updated SNA. This compromise particularly focused on the treatment of unfunded government-sponsored pension schemes, introducing flexibility in the recording of their entitlements (see subsection 2.7 of the report).

As a follow up of this compromise, which was endorsed in broad terms by statistical authorities, the Task Force has developed a standard supplementary table on pension schemes (see table 3.1 in subsection 3.2.1 of the report) which provides a complete accounting of pension entitlements (stocks and related flows) for all *pension schemes in social insurance*, including social security pension schemes. This supplementary table, which is intended to be completed and transmitted by all EU Member States under the revised ESA, has two main purposes – presenting users with an overview of pension scheme data and providing the means by which more comparable data could be achieved across countries worldwide (irrespective of their application of the flexibility of recording introduced in the updated SNA).

In developing the supplementary table, the Task Force made the following recommendations:

- The supplementary table should include pension entitlements for survivors, and also for disability or invalidity type benefits which are provided for within a pension scheme.
- All recording in the supplementary table should be undertaken *gross of taxation and social contributions* (to ensure harmonisation of recording across regimes where pensions are treated differently).
- Pensions schemes are categorised according to nature (defined contribution and defined benefit), and also with respect to "*sponsor*". The Task Force adopted a definition of sponsor based on the OECD pension glossary, whose main criterion for a sponsor is that it "designs, negotiates and normally helps to administer an occupational pension plan for its employees or members."
- To ensure a full reconciliation for *social security pension scheme entitlements*, where no imputed employer social contribution would be appropriate, a separate row is included in the supplementary table for the "other (actuarial) increase of pension entitlements in social security pension schemes". The entries in this row might be positive or negative.
- The *distinction between transactions and other economic flows* should be carefully defined, since employers' imputed social contributions (part of compensation of employees) are usually calculated as a residual when completing the supplementary table. Where possible other economic flows should be further broken down. More specifically:
  - The impact of *changes in real wages* should be reflected in transactions (irrespective of the method chosen to account for wage increases – see below – where application of the ABO or the PBO approach should lead to similar levels of transactions being recorded over time), except for periodic revisions to assumptions for future real wage changes due to the general review of assumptions or major re-structuring of the workforce.
  - *Reforms to a pension scheme* which impact on already-accumulated pension entitlements should be recorded as transactions (capital transfers), except where the reforms have been imposed by a third party.

Following the instructions of the UN Statistical Commission and of the CMFB, the Task Force has worked on the possible *criteria to determine if the pension entitlements of a pension scheme should be recorded in the "core" national accounts or only in the supplementary table*. This proved to be a very challenging task given the diversity in institutional arrangements for pensions across countries, and the CMFB questionnaire revealed a wide diversity of opinions across EU Member States. Nevertheless, the Task Force was able to agree on a suggested draft paragraph for the updated SNA, as follows:

*“The distinction between those schemes whose entitlements are carried forward to the core accounts, and those which are not, should be based on an analysis of the characteristics of the individual pension scheme. The analysis should take into account several criteria - the closeness between government employer pension schemes and social security pension schemes, for example through the legal or financial integration of the government employer pension scheme with the social security pension scheme, the funding and the risk aspects of the scheme, the nature of the contract, and the ability of governments to change the benefit formula. Whilst no single criterion may be decisive, the analysis should examine these criteria to obtain a balanced view. There should be full transparency of the reasoning for core and non-core recording.”*

The Task Force has liaised closely with the SNA Editor during the drafting of the corresponding section on pensions in chapter 17 of the updated SNA. A first draft of this chapter was presented for worldwide comment in July 2007 and received broadly positive feedback. A revised chapter 17 is expected to be made available in the run-up to the UN Statistical Commission meeting at end-February 2008. The revised chapter is expected to be broadly in line with the Task Force's approach, albeit with a more general treatment of some aspects (where the Task Force felt it would be important to be more specific to improve harmonisation of recording).

#### **Empirical work and country studies (sections four and five of the report)**

The Task has devoted much of its time since its interim report to the CMFB in June 2007 to the discussion of issues in estimating pension entitlements, including (for most Task Force members) some initial modelling of government-sponsored pension schemes. It has also taken close account of the work of the Ageing Working Group, and the ongoing development of an International Public Sector Accounting Standard (IPSAS) on employee benefits, which is expected to be released shortly.

Pension entitlements are classified in the updated SNA as a subcategory of the financial asset category insurance, annuities, pension and standardised guarantee schemes. They are defined as ‘financial claims both of existing and future pensioners hold against either their employer or a fund designated by the employer to pay pensions earned as part of a compensation agreement between the employer and the employee. The entitlements due under pension schemes comprise two elements; one when *the formula determining the amount of the pension is agreed in advance* (as under a defined benefit scheme) and one where the amount of the pension depends on the performance of specified financial assets (a defined contribution scheme). *For the former, an actuarial estimation of the liabilities of the pension provider is used; for the latter the value is the market value of the financial assets held by the pension fund on behalf of the future beneficiaries.*<sup>1</sup>

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<sup>1</sup> See paragraph 11.82 of chapter 11 and paragraph 13.84 of chapter 13 of the updated SNA. Further details on the calculation of these entitlements are provided in the new chapter 17. The definition does not cover social security.

The Task Force believes that the "*accrued-to-date*" definition of pension entitlements is the most appropriate for national accounts. These pension entitlements are actuarially estimated: They consist of the present value of all future pension expenditure due to current workers and pensioners (confined to those pension rights accrued to date.)

Given the importance of developing comparable statistics on pension schemes across countries, the Task Force has agreed on the importance of comparable (but not necessarily identical) assumptions during the modelling of pension schemes. The Task Force recommends the following assumptions:

- The *discount rate* should predominantly be based on yields on central government bonds (where the market is sufficiently liquid and the instruments are sufficiently mature) or, exceptionally, high quality corporate bonds. In principle the same discount rate should be applied for all government-sponsored schemes in a country.
- The *Projected Benefit Obligation (PBO)* approach will be most appropriate for the treatment of the impact of *real wage changes* on pension entitlements in national accounts. The PBO approach assumes a non-zero (usually positive) future development of real wages, unlike the alternative *Accumulated Benefit Obligations (ABO)* approach which assumes zero future changes in real wages (see also subsection 3.4).
- *Demographic assumptions* (notably mortality) should be based as far as possible on the comparable demographic data compiled by Eurostat (EUROPOP).

The Task Force has noted that the consistent application of these recommendations across all pension schemes in the economy will be very difficult given the coverage and the broad variety of source data in the various EU Member States (individual data versus aggregated data by age, gender or type of entitlement).

Nevertheless in the case of government-sponsored pension schemes it is assumed that there may be greater opportunity to monitor the assumptions used by modellers, or apply them directly in a model. This, and other practical aspects in pension modelling and completing the supplementary table, will be explored in a forthcoming draft compilation guide (which is expected to be presented as a room document at the CMFB meeting).

Most Task Force members undertook some *modelling* of selected government-sponsored pension schemes, and explored the issues to be addressed when completing the supplementary table. In a few cases the World Bank's PROST software was used to provide a helpful benchmark, although it is not expected that this software would be widely used in future national accounts compilation. In addition experts from the Research Center for Generational Contracts of the Freiburg University have worked

with the Secretariat and the Task Force members to compile estimates for selected government-sponsored pension schemes (notably social security pension schemes) using the ‘Freiburg model’.

The two tables below present a summary of the preliminary results for stocks of pension entitlements obtained from the various approaches, both in national currency and as a percentage of GDP. It must be stressed that these results are only indicative and in most cases would need to be reviewed and further developed before being made available to a wider audience. Nevertheless the results show that the pension entitlements are very substantial, particularly for social security pension schemes whose entitlements may exceed 300% of GDP in some countries.

Table 1 refers to results which have been compiled nationally and with the Freiburg model for some (unfunded) government employee pension schemes in Germany, Spain, France, the Netherlands and Poland. Both, the ABO valuation method and the PBO valuation method have been applied. The data for Germany, Spain, France and Poland show the pension entitlements of general government vis-à-vis civil servants, the data for the Netherlands the pension entitlements of the military fund.

**Table 1: Pension entitlements for government employee pension schemes**  
(column G of the supplementary table)

Country	Year	Model	Wage growth	Pension entitlements	
				in billions national currency	as a percentage of GDP
Germany	2006	Freiburg	ABO	942	41
			PBO	1,129	49
Spain	2006	National	PBO	223	23
France	2006	National	PBO	941	53
		Freiburg	ABO	902	50
			PBO	1,093	61
Netherlands	2006	Freiburg	ABO	20	4
			PBO	24	5
Poland	2006	Freiburg	ABO	260	25
			PBO	303	29
United Kingdom	2004-05	National	PBO	531	45

A relatively broad range of estimates has already been made available for pension entitlements of social security pension schemes. Estimates have been carried out by using national models (Germany, Spain, France, Sweden and the UK), the World Bank model PROST (Germany, France and Poland) and the Freiburg model (Czech Republic, Germany, Spain, France, Hungary, the Netherlands, Poland and Sweden).

The assumptions made in the Freiburg model were identical across countries (3% real discount rate, 1.5% real wage growth), whereas national models adopted different assumptions. It is clear from the modelling work that the impact of the choice between ABO and PBO approaches for the treatment of

the real wage growth is substantial (PBO approaches lead to higher stocks of pension entitlements, often by a factor of 10-20%).

**Table 2: Pension entitlements for social security pension schemes**  
(column H of the supplementary table)

Country	Year	Model	Wage growth	Pension entitlements	
				in billions national currency	as a percentage of GDP
Czech Republic	2006	Freiburg	ABO	5,231	162
			PBO	6,474	200
Germany	2004	National	ABO	4,168	186
			PBO	5,669	253
	2005	Freiburg	ABO	4,136	185
			PBO	5,268	235
	2006	Freiburg	ABO	5,386	232
			PBO	6,464	278
2005	World Bank	PBO	6,710	289	
Spain	2006	National	PBO	2,349	240
		Freiburg	ABO	1,969	201
			PBO	2,333	238
France	2005	National	PBO	5,623	327
	2006	Freiburg	ABO	4,225	247
			PBO	5,248	293
		World Bank	PBO	5,721	319
Hungary	2006	Freiburg	ABO	54,272	228
			PBO	65,220	275
Netherlands	2006	Freiburg	ABO	690	129
			PBO	872	163
Poland	2006	Freiburg	ABO	2,695	255
			PBO	3,037	287
		World Bank	PBO*	2,579	243
			PBO**	464	44
Sweden	2002	National	ABO	5,729	242
	2003			5,984	243
	2004			6,244	243
	2005			6,461	242
	2006			6,703	236
	2006	Freiburg	ABO	4,760	168
	2006		PBO	5,620	198

\* FUS: Social Insurance Fund

\*\* FER: Disability and pension Fund (farmers)

## 1. Introduction

The Eurostat/ECB Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government was established and its mandate was agreed by the CMFB in its June 2006 meeting. It foresees that the Task Force should undertake the following tasks: (i) Review existing material on the measurement of pension schemes and social security classified in the general government sector; (ii) On the basis of this review, identify the statistical methodological issues which would need to be resolved to produce best possible estimates of these assets and liabilities. These issues will include investigation of the borderlines between social security and public employee schemes, and between schemes with actual liabilities accrued to date and schemes with contingent liabilities; (iii) Discuss and reach an agreement on the appropriate methodological approaches to be taken on the identified issues; (iv) Produce statistical estimates for as many past years as possible of the appropriate stocks and flows relating to these financial assets and liabilities, based on national accounting principles, for the participating Task Force countries; and (v) Elaborate a methodological guidance note which could be used in non-Task Force countries for the purposes of preparing the best possible estimates of these assets and liabilities.

The Task Force met six times dealing with methodological and measurement issues as outlined in the mandate. The meetings were organised since September 2006 in which experts from the following countries and international organisations have participated: Czech Republic, Germany, Spain, France, Italy, Hungary, the Netherlands, Poland, Finland, Sweden, the United Kingdom, the OECD, the IMF, DG ECFIN and the SNA Editor. It was intended to conclude the work by 1 May 2007. However, due to the complexity of the issues the CMFB agreed to extend the timetable of the Task Force up to end 2007.<sup>2</sup>

The main tasks carried out by the Task Force were (i) the design and the description of a supplementary table on pension schemes in social insurance to be part of the pension section in the updated SNA; (ii) the specification and definition of concepts related to the institutional units involved and to the stocks, transactions and other flows shown in the table; (iii) the selection and assessment of criteria to distinguish between defined-benefit government-sponsored employer pension schemes to be recorded in the core accounts or only in the table; (iv) the stock-taking of the features of all government-sponsored employer pension schemes and social security pension schemes in the EU Member States based on a questionnaire; (v) the coordination of the modelling work and the estimation of pension entitlements by using national models and generic models as provided by consultants of the Research Center for Generational Contracts of the Freiburg University and of the World Bank; (vi) the

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<sup>2</sup> The Task Force mandate is included in Annex 1; the list of the Task Force participants is included in Annex 2.

presentation of the Task Force work to the CMFB in January 2007 and June 2007 and to the Eurostat Working Groups on National Accounts and Financial Accounts. It is also intended to inform the EPC – via the CMFB - and its Ageing Working Group on the work of the Task Force.

The Report consists of five parts of which this introduction is the first. The second part deals with the background of the Task Force since late 2002. The third part describes the methodological work carried out by the Task Force. It covers the new treatment of pension entitlements in the updated SNA, describes their recording in the supplementary table on social insurance and discusses recording like the selection of the discount rate, the Accumulated-Benefit Obligation (ABO) and Projected Benefit Obligation (PBO) principles for the valuation of pension entitlements and the demographic data.

The fourth part describes the empirical work undertaken so far by the Task Force. It refers, in an overview, to the schemes for which estimations have been carried out, to the model assumptions and to the main outcomes of the estimations. The final part covers the country studies based on the national models and on the generic models provided by the University of Freiburg and by the World Bank. A draft technical guide for compilers has been compiled separately.

## 2. Background to the Task Force

### 2.1. Current accounting of pensions in international statistical standards

The issue of the recording of pension entitlements was identified very early in the *System of National Accounts* (1993 SNA) update process as a major topic to be addressed. A number of compilers and users of the 1993 SNA had expressed dissatisfaction with the existing heterogeneous treatment of pension schemes depending on their unfunded or funded nature, and the IMF had decided to recognise a liability for unfunded employer pension schemes in its *Government Finance Statistics Manual 2001* (GFSM 2001).

The 1993 SNA recognises unfunded pension obligations neither as liabilities of unfunded employer retirement pension schemes, operated by governments or corporations, nor as financial assets of the beneficiaries. This is done so because unfunded pension obligations are not seen as liabilities in a strict sense. However, the 1993 SNA is not so explicit on this issue. It only mentions that “the scope of counterparts ... does not cover entitlement to contingent benefits or collective services. Such benefits are generally uncertain or not quantifiable, or both.”<sup>3</sup>

Further, the 1993 SNA distinguishes between social security schemes and employer insurance schemes, and among the latter between funded and unfunded schemes. Concerning net equity in unfunded pension schemes, the 1993 SNA proposes “that the present value to households of promises by these schemes to pay future pension benefits be shown as memorandum items in the balance sheets as assets of households. Liabilities of equivalent amount may also be shown as memorandum items for the employer sectors liable to pay these benefits.”<sup>4</sup>

Contrary to the 1993 SNA, the IMF's GFSM 2001 recommends, that “transactions in unfunded government employer retirement schemes are considered in this manual to involve a contractual liability for a government to its employees. As a result, the receipt of contributions to such schemes is considered to be an incurrence of a liability, and the payment of retirement benefits is considered to be a reduction of the same liability.”<sup>5</sup> Consequently, the stocks of government liabilities for all employer schemes, both funded and unfunded, are recognised as insurance technical reserves.

The *European System of Accounts* (1995 ESA) is, like the 1993 SNA, quite clear on the treatment of such unfunded schemes. Like the 1993 SNA, the ESA defines social insurance schemes as schemes for which “one or more of the following conditions must be satisfied: (a) participation in the scheme is obligatory either by law for a specified category of workers, whether employees, self- or non-employed,

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<sup>3</sup> See SNA93, paragraph 3.20.

<sup>4</sup> See SNA93, paragraph 13.88.

<sup>5</sup> See GFSM, paragraph 4.35.

or under the terms and conditions of employment of an employee, or group of employees; (b) the scheme is a collective one operated for the benefit of a designated group of workers, whether employees, self- or non-employed, participation being restricted to members of that group; (c) an employer makes a contribution (actual or imputed) to the scheme on behalf of an employee, whether or not the employee also makes a contribution.<sup>6</sup> The ESA95 also states that “provisions or similar funds constituted by employers to provide employees with pensions (non-autonomous pension funds) are only included in the category insurance technical reserves if they are calculated according to actuarial criteria similar to those used by insurance corporations and autonomous pension funds.” Furthermore, provisions are excluded which might have been “established by institutional units classified in the sub-sector social security funds (S.1314). In the system, these provisions are not liabilities of the social security funds sub-sector.”<sup>7</sup>

## **2.2. Reasons for changing the treatment of pension schemes in the 1993 SNA**

There were mainly three reasons for changing the treatment of unfunded employer retirement pension schemes in the 1993 SNA. First, the different accounting for funded and unfunded schemes leads to different ‘effects’ on key variables like income, saving, financial assets or liabilities. Second, unfunded employer pension schemes are particularly significant for the general government and the public sector. In the light of demographic developments and the foreseeable fiscal burden from ageing populations in almost all developed economies, there is a well-founded interest in having available more comprehensive statistical information on commitments of governments. This also refers to the impacts of pension reforms being undertaken and/or being at the political agenda in many countries. Third, the convergence of the international statistical standards and the international accounting standards (IAS) is aimed at, and the treatment of unfunded employer retirement pension schemes in the 1993 SNA deviates from the IAS and from the International Public Sector Accounting Standards (IPSAS). These accounting standards recognise unfunded employer retirement pension obligations as liabilities.

Even for funded schemes, increasing concern about under-funding meant that it was desirable to examine the consequences of liabilities without matching assets throughout large parts of the corporate sector in some countries. It thus seemed appropriate to examine the consequences of any degree of under-funding including the complete absence of funding in the System.

Accordingly, the current treatment of unfunded employer retirement pension schemes in the 1993 SNA was criticised and it was argued that, for reasons of comparability, obligations that seem to be liabilities, should be reflected in the core accounts of the 1993 SNA. Furthermore, the reporting of unfunded pension liabilities as memorandum items, as recommended by the 1993 SNA, has not been

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<sup>6</sup> See ESA95, paragraph 4.87.

<sup>7</sup> See ESA95, paragraphs 5.101 and 5.102.

applied in practice. Therefore it was proposed that the updated SNA should record the financial assets and liabilities of all pension schemes regardless of the degree of funding, if any.

### **2.3. IMF Electronic Discussion Group on the treatment of pension schemes**

In order to take forward the discussion, the IMF was asked to establish an *Electronic Discussion Group* (EDG) on the treatment of pension schemes in macroeconomic statistics. This EDG ran from late 2002 to late 2005 (last posting, though it is still open).<sup>8</sup> The main nearly-unanimous recommendations of the EDG at that point in time were that all employer retirement pension obligations should be recognised as liabilities in the system, whether they originate from funded or unfunded pension schemes, and that the recording of certain transactions should change. However social security pension obligations should not be recognised as liabilities in the SNA.

### **2.4. Eurostat's Task Force on pensions**

*Eurostat's Task Force on the SNA Review* and the *Financial Accounts Working Group (FAWG)* reviewed the EDG recommendations and in December 2004 Eurostat wrote to the Advisory Expert Group on National Accounts (AEG) to ensure that the issue remained open and that alternative options were explored. In particular, it was explained that in many European countries the borderline between employer unfunded pension schemes and social security schemes is not clear.<sup>9</sup>

The alternative options proposed by Eurostat included the following two options, which are based on the presumption that unfunded employer schemes and social security pension schemes should be treated in the same way: (i) "Option 5 – Create a new accumulation account for all unfunded pension obligations (to be recorded as liabilities)"; or (ii) "Option 6 – Create a new other economic flow to capture the increase/decrease in all unfunded pension obligations (to be recorded as liabilities)."

Eurostat organised a specific Task Force on pensions to follow up, which met three times during late 2004 and early 2005. The Task Force collected information on the national schemes in EU Member States and reached certain views: "(i) The unfunded pension schemes of private corporations should be treated as if funded, with a liability and expense recognised on an actuarial basis; and (ii) There are two possible approaches for government employer schemes – treat them on a case-by-case basis in the core accounts (with a comprehensive supplementary table for schemes not recorded in the core accounts), or record all of them 'on balance sheet' with their impact recorded in a new 'accumulation account'."

At the FAWG meeting on 10 and 11 May 2005, a majority of delegates supported an approach suggested by Reimund Mink (ECB) and Richard Walton (Bank of England) which would consist of

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<sup>8</sup> The detailed report of the moderator of the Group, Philippe de Rougemont, from late 2003 may be found at the following link: <http://www.imf.org/external/np/sta/ueps/2003/122303a.pdf>.

<sup>9</sup> See the link: <http://www.internationalmonetaryfund.com/external/np/sta/ueps/2004/120304.pdf>.

producing a supplementary account for pension schemes and no change to the current treatment of government employer unfunded pension schemes in the SNA accounts. This approach was endorsed by the *CMFB* on 7 and 8 July 2005.

## **2.5. IMF/BEA Task Force on pensions and AEG conclusions**

On 21-23 September 2005 the IMF and the US Bureau of Economic Analysis (BEA) jointly chaired an *international Task Force meeting on employers' retirement schemes*. This Task Force concluded on several aspects. Most important was that (i) a clear majority of the Task Force recommended that all pension liabilities of employers should be recognised, irrespective of the degree to which the schemes are funded; (ii) schemes set up by the government for its employees and in which benefits arise from the employment contract should be treated as employer schemes, even if they are labelled "social security".

Based on the conclusions of the Task Force a report was forwarded to the fourth AEG meeting which took place in Frankfurt am Main on 30 January to 8 February 2006. All recommendations were reviewed and conclusions reached on employer pension schemes. The key issue at stake was whether obligations of unfunded employer pension schemes should be recorded in the core system of the new SNA (as recommended by the IMF/BEA Task Force on pensions); or in a supplementary set of accounts (as proposed in the *CMFB* paper). There was strong support within the AEG for the Task Force recommendation to recognise the liabilities for all employer pension schemes, including unfunded ones, and any associated assets and transactions.<sup>10</sup>

Nevertheless, the issues raised by many European countries were taken into consideration, especially the difficulties in drawing the line between pension schemes for government employees and social security schemes, and the following conclusions were reached: (i) The AEG saw that there are problems for several countries in drawing a distinction between pension schemes for government employees and social security schemes; (ii) The AEG felt it necessary to develop criteria that would distinguish between the several types of schemes. Possible criteria, among others, could be the employer/employee relationship or the nature of the liability (e.g. whether it is a contingent or an actual liability); (iii) The ISWGNA<sup>11</sup> will explore alternatives for developing criteria; (iv) The AEG noted the possibility, until such criteria are developed, of countries not including the liabilities for pensions of government employees in the core accounts but of including them together with the liabilities for social security schemes in supplementary accounts; (v) The AEG also supported the possibility of including supplementary accounts for social security schemes.<sup>12</sup>

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<sup>10</sup> Report of the AEG held in Frankfurt, available on the UNSD web site.

<sup>11</sup> The Inter-Secretariat Working Group on National Accounts – an international coordinating body comprising Eurostat, the IMF, the OECD, the World Bank and the United Nations.

<sup>12</sup> Report of the AEG held in Frankfurt, see above.

## 2.6. Conclusions of the United Nations Statistical Commission and follow-up

As reflected in the report on its 37<sup>th</sup> session from 7 to 10 March 2006 the UN Statistical Commission took note of the concerns on the treatment of unfunded government pension schemes and the need for continuing consultations on the recommendation of the AEG on that issue, and expressed its positive outlook on a timely resolution. Further discussions on this issue took place at a succession of international meetings, notably at the meeting of the OECD Committee on Statistics in June 2006.

Further work was undertaken over the summer between international organisations in an attempt to find a compromise solution, and the ISWGNA Management Group, on 3 September 2006, responded positively to the concept of the possible compromise. Further consultations were held in the margins of the Committee for the Coordination of Statistical Activities meeting in Montreal. There was therefore an **emerging consensus** on a compromise proposal involving flexibility in the updated 1993 SNA for recording of pension schemes.

## 2.7. The compromise on the treatment of pension schemes in the new SNA

Six "basic principles" which had been elaborated during collaboration between international organisations and found widespread support amongst senior statistical staff in summer 2006:<sup>13</sup>

- (i) All employer pension-related flows and stocks, including pension entitlements, provided by private schemes are recorded in the core accounts, even if they are unfunded. In this context a private scheme is any for which the government is not directly responsible (as noted in point (vi), even schemes for which government is responsible are included if they are mainly funded);
- (ii) The updated SNA will include a supplementary table on pensions which will become a standard requirement in the updated SNA. In this table, all flows and stocks of all pension schemes (autonomous pension funds, segregated non autonomous employer schemes, pension part of social security, etc.) will be shown. This table will thus include details of pension flows and stocks that are recorded in the core accounts plus those that are not included in the core accounts also giving a complete view of households' pension "assets";
- (iii) It is suggested that this supplementary table would be compulsory for European Union member states through ESA regulation.

*Concerning government sponsored systems:*

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<sup>13</sup> See also the exchange of letters between the ECB (Mr Werner Bier) and the IMF (Mr Robert W. Edwards) in summer 2006. The ECB letter of 28 July 2006 with comments on the recommendations made by the AEG at its meeting in Frankfurt in early 2006 also includes a proposal of principles (as outlined above) how to record pension schemes in the updated SNA. In a response letter by the IMF of 17 September 2006 the proposal was seen as very promising and as the basis for a worldwide consultation on this issue.

(iv) Pension entitlements of unfunded, pay-as-you-go government sponsored systems which provide the basic social safety net type of provision, sometimes referred to as pillar one type provision, will be only recorded in the supplementary table (but not in the core account);

(v) The recommendation of the new SNA regarding the recording of unfunded pension schemes sponsored by government for all employees (whether private sector employees or government's own employees) will be flexible. Given the different institutional arrangements in countries, the updated SNA will permit recording only some of these pension entitlements in the core accounts. However, it will be a requirement that a set of criteria be provided to explain the distinction between those schemes carried forward to the core accounts, possibly where the pension promise is of sufficient strength, and those recorded only in the supplementary table. Providing a single set of internationally recognized criteria for this distinction should be on the long-term SNA research agenda; and

(vi) Pension entitlements of funded systems sponsored by the government will be recorded in the core accounts.

## **2.8. Establishment of the Eurostat/ECB Task Force on pensions**

The Eurostat/ECB Task Force on pensions was established by the CMFB at its June 2006 meeting. It concentrated initially on the discussion of the compromise on the treatment of pension schemes in the new SNA, prepared by some international organisations and proposed by the ISWGNA. The focus was on the design of a supplementary table on pensions which forms a key part for implementation of the compromise. Following the first meeting of the Task Force, a slightly amended version of the compromise was presented to the ISWGNA in October 2006, which was subsequently forwarded to members of the AEG for worldwide consultation, and the compromise received wide support.

The Task Force continued its work on the design of the supplementary table and on other aspects of the proposed compromise and started discussion on the modelling and estimation aspects of pension schemes for national accounts purposes, and on the borderline between social security and government-sponsored employer pension schemes. The following part deals with the methodological work done by the Task Force. This work is substantially linked to the design of the supplementary table as mentioned in the compromise.

### 3. Methodological work

#### 3.1. Treatment of pensions in the new SNA

The *treatment of pensions* in the new SNA is part 3 of chapter 17 on cross-cutting and other special issues. It starts with describing *three different types of pension schemes – social security, employment-related pension schemes (other than social security) and social assistance*. In this context the term *social insurance schemes* is introduced covering social security and employment related pension schemes (other than social security). The key distinction between social insurance and social assistance is that social insurance benefits are only paid if the beneficiary participates in the scheme while social assistance is paid without qualifying contributions having been made.

The chapter acknowledges the variety of forms in which social insurance pension schemes are organised. In many European countries most of the social insurance pensions are provided via social security. In these cases government relieves the employer of the risk that the cost of pensions may be too great for his corporation to meet and assures the beneficiaries that pensions will be paid.

*Employment-related pension schemes* (other than social security) are described as part of the employee's compensation package. Accordingly, negotiations between employees and employers may focus on pension entitlements as much as on current conditions of service and pay scales. Two forms of employment-related pension schemes (other than social security) are distinguished: *defined contribution schemes* and *defined benefit schemes*. *Defined contribution schemes* are schemes where the benefits are defined exclusively in terms of the level of the fund built up from the contributions made over the employee's working life and the increases in value that result from the investment of these funds by the manager of the pension scheme. The entire risk of the scheme to provide an adequate income in retirement is thus borne by the employee. *Defined benefit schemes* are schemes where the benefits payable to the employee on retirement are determined by the use of a formula, either alone or as a minimum amount payable. When a formula is used to determine benefits, the risk of the scheme to provide an adequate income in retirement is borne by the employer. Under a hybrid scheme the risk is shared between the employer and the employee. One should note that notional defined contribution schemes and hybrid schemes<sup>14</sup> are treated as defined benefit schemes in the following analysis.

The supplementary table on social insurance as designed and developed by the Task Force (see Table 3.1 below) will be introduced in chapter 17 of the update SNA. Its design is mainly based on the "basic principles" as mentioned above. The table breaks down the social insurance pension schemes by type in its columns, and lists the relevant national accounts stocks and flows in its rows.

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<sup>14</sup> Hybrid schemes are those schemes which have both a defined benefit and a defined contribution element.

### **3.2. Pension schemes in social insurance as recorded in the supplementary table**

The compromise on pension schemes envisages a supplementary table to present data (including for pension entitlements) for all pension schemes included as social insurance. This table serves two purposes – to provide the user with a fuller picture of the activities and positions of pension schemes than can be obtained from the core accounts, and to provide the basis for compiling comparable stock and flow data of all pension entitlements from a debtor (pension scheme) and also from a creditor (household) point of view across countries which apply the flexibility of reporting in core or not in different ways.

The table works on the basis of a **full reconciliation between the opening stock and the closing stock of pension entitlements**, taking account of all transactions and other economic flows. It is intended to be completed for individual years, with the opening stocks of pension entitlements of the current year equal to the closing stocks of pension entitlements of the previous year. This is in line with the logic explained in the updated 1993 SNA.

The Task Force has devoted a large part of its time to the design of the supplementary table, and its draft formed the basis of the table in chapter 17 of the updated SNA.

#### **3.2.1. The coverage of the supplementary table**

The supplementary table is intended to cover only pension schemes included as **social insurance** (Table 3.1). This implies that neither social assistance nor individual saving schemes are included. Some Task Force members have noted that it would nevertheless be useful to show data for these schemes alongside the supplementary table, to complete the picture for users.

Social insurance schemes may provide benefits other than pensions, for example health benefits that can be very significant for retirees. The updated SNA includes separate transactions for the pension and non-pension elements of social insurance. Non-pension liabilities are included only when these actually exist. In principle the supplementary table covers the pension part of social insurance only but in practice it may not be possible (or may not be sufficiently important) to separate the non-pension element.

The updated SNA will introduce revised definitions of social insurance and social assistance, and the Task Force has noted the importance of carefully implementing this borderline in the new ESA. There was also some acknowledgement that there could be elements of social assistance within pension schemes generally organised as social insurance which might not be separable (therefore they would enter the supplementary table).

**Table 3.1: Supplementary table on pension schemes in social insurance**

Relations	SNA code	Row No.	Recording	Core national accounts							Not in the core accounts	Total pension schemes	Counter parts: Pension entitlements of resident households <sup>4)</sup>		
				Non-general government			General government								
				Sponsor	Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>					Social security pension schemes	
									Classified in financial corporations	Classified in general govt					Classified in general government
Column number	A	B	C	D	E	F	G	H	I	J					
<b>Opening balance sheet</b>															
	F63	1	Pension entitlements												
<b>Changes in pension entitlements due to transactions</b>															
Σ 2.1 to 2.4	D5201	2	Increase in pension entitlements due to social contributions												
	D5201	2.1	Employer actual social contributions												
	D5211	2.2	Employer imputed social contributions												
	D5231	2.3	Household actual social contributions												
	D5241	2.4	Household social contribution supplements <sup>5)</sup>												
		3	Other (actuarial) change of pension entitlements in social security pension schemes												
	D5321	4	Reduction in pension entitlements due to payment of pension benefits												
2 + 3 - 4	D7	5	Changes in pension entitlements due to social contributions and pension benefits												
		6	Transfers of pension entitlements between schemes												
		7	Changes in pension entitlements due to pension scheme reforms												
<b>Changes in pension entitlements due to other economic flows</b>															
		8	Changes in entitlements due to revaluations <sup>6)</sup>												
		9	Changes in entitlements due to other changes in volume <sup>6)</sup>												
<b>Closing balance sheet</b>															
1+ Σ 5 to 9	F63612	10	Pension entitlements												
<b>Related indicators</b>															
	PI	11	Output												
		12	Assets held at the end of the period to meet pensions <sup>7)</sup>												

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element (see chapter 17 of the updated SNA).

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are 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) These supplements represent the return on members' claims on pension schemes, both through investment income on defined contribution schemes' assets and for defined benefit schemes through the unwinding of the discount factor applied.

6) A more detailed split of these positions should be provided for columns G and H based on the model calculations carried out for these schemes.

7) This row includes financial and non-financial assets held for the sole purpose of paying future pensions, excluding claims by the pension scheme on its sponsor; an explanation should be provided of which assets have been included.

The cells shown as ■ are not applicable; the cells in ■ will contain different data from the core accounts.

Many pension schemes cover entitlements for **survivors** (e.g. dependent spouses, children, orphans) and the Task Force recognised that these entitlements should be included in the supplementary table. The Task Force also acknowledged that the treatment of **disability and invalidity type benefits** could

be rather important in some schemes. A split could be made in some schemes (at least for pension entitlements). Since disability / invalidity can be considered another form of retirement within a pension scheme, the Task Force concluded that disability and invalidity type benefits provided for within pension schemes should be included in the supplementary table. All elements of the supplementary table should be recorded gross; no deductions are made for taxation, further social contributions or the service charge associated with the pension scheme.

### 3.2.2. The columns of the table

At the top level of the columns there is a division based on the recording of the pension schemes in the **core national accounts or not in the core national accounts** (Table 3.2). The entitlements of pension schemes shown in columns A to F are recorded in the core national accounts, while the entitlements of pension schemes in columns G and H are not included in the core national accounts. These two columns showing the data for the government-sponsored defined benefit schemes not recorded in the core accounts and for social security pension schemes are the focus of this supplementary table: by adding pension entitlements of these columns to those recorded in the core accounts (columns A, B, D, E, and F), it will be possible to compare the pension scheme data by country, where some countries worldwide might include certain schemes' entitlements in the core accounts and others (for sometimes similar schemes) may not. There is an important issue of the criteria to distinguish between core and non-core recording of entitlements which is considered in sub-section 3.2.3 below.

**Table 3.2: Columns of the supplementary table on pension schemes in social insurance**

Recording	Core national accounts						Not in the core accounts		Total pension schemes	Counterparts: Pension entitlements of resident households <sup>4)</sup>
	Non-general government			General government						
Sponsor	Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes			
					Classified in financial corporations	Classified in general government				Classified in general government
Column number	A	B	C	D	E	F	G	H	I	J

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element (see the new draft SNA).

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are 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.

The pension schemes are classified further by the **sponsor** of the pension scheme. In the table, government and non-government sponsors are distinguished. The definition of a sponsor is not straightforward, and the Task Force agreed to follow the relevant terminology in the pensions field by

adopting a definition from the OECD pensions glossary, as follows: “An institution (e.g. corporation, industry/employment association) that designs, negotiates, and normally helps to administer an occupational pension plan for its employees or members. This may also involve the sponsor being eventually responsible for paying the pensions (in which case an asset/liability relationship is to be shown in national accounts), but this is not necessarily always the case.”<sup>15</sup>

On the definition of the sponsor, it was noted that some government-sponsored employer pension schemes contain a mixed membership (for example including employees of public corporations) and many pension schemes have frozen the membership of participants who have moved to other employers (this is sometimes called "inactive membership"). The Task Force felt a pragmatic approach should be taken – a small proportion of non-government employees should not prevent a scheme being described as government-sponsored.

It is probable that the term “sponsor” will not be used in the updated SNA in order to allow for schemes outside the EU where a private corporation administers the scheme and assumes the responsibility for any under-funding of a pension scheme (and retains any over-funding) but does not influence the design of the scheme or negotiate with the members. Because of the possible ambiguity of the term sponsor in this (and other) contexts, the SNA will make clear whether the unit being described is the unit responsible for designing the scheme or the unit accepting the risk of finding the funds to meet the liabilities.

The columns below distinguish between defined contribution schemes (shown in columns A and D) and defined benefit schemes (shown in columns B, E, F and G). Column B is intended to include non-government-sponsored defined benefit schemes; however it may also contain **hybrid pension schemes** which have both a defined benefit and defined contribution element. Such hybrid schemes appear to be rare in government; however the Task Force has seen some examples of "notional" defined contribution schemes which share features of both types of schemes.

For most private pension schemes, whether the sponsor is a financial or non-financial corporation, the pensions fund is likely to be classified in the pension fund sub-sector of the financial corporations sector. Only schemes where the non-financial corporate sponsor has a non-autonomous fund or a completely unfunded scheme will the pension liabilities appear in the non-financial corporations sector. In contrast, most government sponsored schemes are likely to be within general government though some may appear in the financial corporate sector, for example if they are administered by a financial corporation or are simply autonomous funds of government. In order to have a clear picture of where government pension liabilities appear in the accounts, column F shows which are in the financial

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<sup>15</sup> See the OECD website <http://www.oecd.org/dataoecd/5/4/2496718.pdf> on: Private pensions: OECD classification and glossary, Paris 2005.

corporations sector, column F shows which are in general government and appear in the core accounts, column G shows which are in general government but are shown only in the supplementary table.

Given that the supplementary table is intended to show all pension schemes in social insurance, column H records stocks and flows for social security pension schemes in the supplementary table. This also has an advantage in those cases where the social security system is indistinguishable from government (or other) employer schemes and therefore some countries might record a high proportion of pension entitlements under social security.

Column J shows the pension entitlements acquired or held by **resident households**. In case of insignificant pension entitlements acquired or held by non-resident households vis-à-vis resident pension schemes the amounts recorded in column J are almost identical with the data included in column I. However, the pension entitlements acquired or held by non-resident households should be shown separately if they are significant for a country. The Task Force felt that this would only be the case for some countries in Europe and that the data sources for column J may be weak.

### **3.2.3. Schemes with core and non-core recording of pension entitlements**

It should be recalled that the basic principles already state that: (1) all flows and stocks provided by private schemes should be in the core accounts; (2) pension entitlements of unfunded, pay-as-you-go government sponsored schemes (pillar 1) may only be recorded in the supplementary table; and (3) pension entitlements of funded systems sponsored by the government should be recorded in the core accounts. At the request of the UN Statistical Commission and of the CMFB, the Task Force has devoted considerable time to examining the possible criteria which would distinguish between the core and non-core recording for government-sponsored defined benefit employer schemes (as reflected in columns F and G of the supplementary table). The criteria have also been included on the long term research agenda of the updated SNA, as recommended by the March 2007 AEG meeting.

As part of a wider CMFB pension questionnaire, the Task Force sought views on emerging criteria. Five characteristics were considered as possible criteria to record pension entitlements in the core national accounts or not in the core national accounts and were included into the questionnaire: (a) the degree of integration within the general government structure; (b) the risk exposure and ability to change the benefit formula; (c) the nature of the contract; (d) the legal framework close to social security pension schemes; and (e) the funding of the scheme. Moreover, the strength of the pension entitlements was considered as an additional criterion, but was not included in the list because of difficulties in interpretation.

*(a) Degree of integration within the general government structure (degree of autonomy):* The Task Force considered whether the scheme is separately organised or completely integrated into the government structure (autonomous versus non-autonomous pension schemes in the 1993 SNA).

Autonomous pension schemes are seen as institutional units separate from the employers, while non-autonomous pension schemes are managed by the employers, with or without segregated reserves. Autonomous pension schemes are classified as financial corporations, while non-autonomous pension schemes are part of the sector of the sponsor; if quasi-corporations are established for the pension schemes they should be classified as autonomous pension schemes.

- (b) *Risk exposure and ability to change the benefit formula*: The Task Force decided that the risk exposure of a government-sponsored employer pension scheme may be assessed by two related questions. If the risk exposure is mainly with the government the pension scheme should only in the supplementary table (non-core). If the government is able to unilaterally change the benefit formula at any point in time, and thereby partially default on its pension obligations, the pension scheme should only be recorded in the supplementary table (non-core).
- (c) *Nature of the contract*: The question also arises whether the contract is voluntary or compulsory and imposed by government. The availability of a *contract* is usually determined by mutual agreement between the employer and its employees and the benefits are linked to the contributions. By contrast, participants of a government employer pension scheme might not enter into the agreement voluntarily, but are rather forced by law to participate (in a similar way to enforced membership of a social security scheme), which would be indicative of a non-core recording. Such agreements are of a ‘public’ law nature which does not always allow for “officially” acknowledged government obligations.
- (d) *Legal framework close to social security pension schemes*<sup>16</sup>: The following features of social security have been identified and compared with a corresponding government-sponsored employer pension scheme: (i) Coverage and purpose; (ii) Funding; (iii) Property of separate funds (government or beneficiaries); (iv) Financing of the schemes (only contributions or also transfers from other government units); (v) Nature of the contracts; (vi) Benefits received not necessarily determined by the contributions paid; and (vii) Treatment of transfers of pension entitlements between schemes. If the legal framework is identical to or very close to that of social security, then this would be an indicative of a non-core recording.
- (e) *Funding (funding versus no funding)*: Funded pension schemes are defined as those schemes that finance pension payments by drawing down on segregated and earmarked assets. These segregated and earmarked assets are dedicated to the payment of pension benefits. From a beneficiary

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<sup>16</sup> The definition of social security schemes in the ESA 95 (Annex III) is as follows: Social security schemes of government are imposed, controlled and financed by government units and cover the entire community, or large sections of the community. Social security schemes of government may be funded or unfunded. When separate funds can be identified, they remain the property of the government and not of the beneficiaries of the schemes. Social security schemes’ receipts consist mainly of contributions paid by individuals and by employers on behalf of their employees, but they may also include transfers from other government units. Participation in social security schemes is usually, though not always, compulsory. The benefits paid to individuals are not necessarily determined by the amounts previously paid in contributions.

perspective, a pension scheme is seen as funded if assets, the pension entitlements, exist against which households can establish legal claims. This meaning of funded does not refer to the adequacy of the reserves established for the payment of benefits vis-à-vis the pension obligations. That is, a funded scheme can be exactly funded, under-funded or over-funded depending on the size of the accumulated assets held for the payment of benefits relative to the value of the pension entitlements. By contrast, unfunded pension schemes are schemes with no identifiable reserves that are assigned for the payment of benefits and against which the beneficiaries (households) can lay claims. This does not exclude that unfunded schemes may hold sizeable assets (for example for liquidity purposes or as buffer funds)<sup>17</sup>. A funded pension scheme would be indicative of a core recording.

**Table 3.3: Possible criteria to record pension entitlements in the core national accounts or not in the core national accounts**

Criterion	Very important	Important	Less important	Un-important
Degree of integration within the general government structure (autonomous versus non-autonomous)	PT, IT, Norway	FR, MT, RO, PL, ES	AT, CZ, EE, SE, SK, IE, SI, UK	FI, DE, NL, DK
Risk exposure / ability to change the benefit formula (general government has discretion to change unilaterally the benefit formula at any point in time and thereby partially default on its obligations)	FR, FI, DE, IT, ES, DK, UK	AT, CZ, NL, PL, SK, IE	PT, MT, RO, EE, SE, SI	
Nature of the contract (generally forced by law to participate)	FR, FI, RO, NL, PL, UK	PT, SE, SK, ES, SI	AT, CZ, MT, EE, IT, IE, Norway	DE, DK
Legal framework close to social security pension funds	FR, CZ, FI, DE, RO, PL, SK, IE, ES	AT, PT, IT, SI, UK	MT, EE, NL, SE, Norway	DK
Funding (no funding versus funding)	CZ, PT, RO, SK, IT, Norway	AT, EE, SI, UK	FR, MT, NL, IE, ES	FI, DE, SE, PL, DK
Other criteria listed by the EU Member States: PT: additional criteria i) the possibility of an individual leaving the scheme being reimbursed of his contributions; ii) the government faculty of arbitrarily changing the rate of contribution; FI: <i>Is the scheme part of collective system covering the large part of community or not</i> ; NL: Is the whole population covered? Is it related to a collective labour contract? A collective labour contract is compulsory by law; FR: As important as the legal framework is the degree of financial integration within the social security (participation in an “equalisation” mechanism). Note: No assessment was provided by BE, BU, CY, GR, HU, LT, LV and LU.				

These five criteria were considered as an input for the CMFB questionnaire. Table 3.3 shows the outcome of the questionnaire. It reflects the difficulty of finding the most important criteria valid for a majority of EU countries, taking into consideration the different national settings of government employer pension schemes. Nevertheless, the outcome of the questionnaire shows that the criterion

<sup>17</sup> The issue of funding is usually linked to the feature of schemes being either defined-contribution or defined-benefit. By definition, defined-contribution pension schemes are always fully funded, and therefore to be recorded in the core accounts. Defined-benefit pension schemes can be funded or unfunded. All unfunded pension schemes are by definition defined-benefit schemes because there are no contributions by the employer, no individual accounts, and only the definition of the benefits is meaningful.

'legal framework close to social security pension schemes' is seen as very important by nine EU countries and as important by five countries (out of 19 countries which have responded).

Whilst all Task Force members (and most countries) can find at least one criterion which they would consider relevant for making the choice, the Task Force found it difficult to decide upon a hierarchy of criteria when making a decision. The Task Force is therefore only in a position to indicate that the above basket of criteria might be considered important in distinguishing between core and non-core recording, however depending on the administrative situation in a country, the specific criteria considered most important might vary.

Based on the basket of criteria as described above the Task Force forwarded, on 8 November 2007, a suggested form of words for paragraph 17.185 of the new SNA to the ISWGNA for further consideration. It proposes that "the distinction between those schemes whose entitlements are carried forward to the core accounts, and those which are not, should be based on an analysis of the characteristics of the individual pension schemes. The analysis should take into account *several criteria* - the *closeness between government employer pension schemes and social security pension schemes*, for example through *the legal or financial integration of the government employer pension scheme with the social security pension scheme, the funding and risk aspects of the scheme, the nature of the contract, and the ability of governments to change the benefit formula*. Whilst no single criterion may be decisive, the analysis should examine these criteria to obtain a balanced view. There should be full transparency of the reasoning for core and non-core recording".

The Task Force understands that a paragraph along these lines will be included in the revised draft of the updated SNA, with the issue of criteria retained on the long-term research agenda.

In substance, the bundle of all five criteria is mentioned as indicated in Table 3.3. Nevertheless, the Task Force noted that - in the context of the drafting of the new ESA - it will be necessary to further refine the approach to assure the cross-country comparability of the data between core and non-core recording.

#### **3.2.4. The rows of the table**

The rows of the table relate to balance sheet positions, transactions and other economic flows associated with pension entitlements of the schemes included in the supplementary table (Table 3.4). Two related indicators refer to the output and the assets held by the pension scheme to meet pensions. Specific SNA-based codes will be added to the table in its final version to aid users. Social contributions of both actual and imputed nature are recorded, following the 1993 SNA methodology. The following paragraphs describe rows which the Task Force spent some time discussing.

**Table 3.4: Rows of the supplementary table on pension schemes in social insurance**

<i>Row No.</i>	
	<b>Opening balance sheet</b>
1	Pension entitlements
	<b>Changes in pension entitlements due to transactions</b>
2	<i>Increase in pension entitlements due to social contributions</i>
2.1	Employer actual social contributions
2.2	Employer imputed social contributions
2.3	Household actual social contributions
2.4	Household social contribution supplements <sup>1)</sup>
3	Other (actuarial) increase of pension entitlements in social security pension schemes
4	Reduction in pension entitlements due to payment of pension benefits
5	Changes in pension entitlements due to social contributions and pension benefits
6	Transfers of pension entitlements between schemes
7	Changes in pension entitlements due to pension scheme reforms
	<b>Changes in pension entitlements due to other economic flows</b>
8	Changes in entitlements due to revaluations <sup>2)</sup>
9	Changes in entitlements due to other changes in volume <sup>2)</sup>
	<b>Closing balance sheet</b>
10	Pension entitlements
	<b>Related indicators</b>
11	<i>Output</i>
12	<i>Assets held at the end of the period to meet pensions<sup>3)</sup></i>

1) These supplements represent the return on members' claims on pension schemes, both through investment income on defined contribution schemes' assets and for defined benefit schemes through the unwinding of the discount factor applied.

2) A more detailed split of these positions should be provided for columns G and H based on the model calculations carried out for these schemes (see explanatory note).

3) This row includes financial and non-financial assets held for the sole purpose of paying future pensions, excluding claims by the pension scheme on its sponsor; an explanation should be provided of which assets have been included.

**Row 1:** This row shows the opening stock of pension entitlements, which is exactly equivalent to the closing stock of the previous year.

**Rows 2.1 and 2.3:** Employer and employee actual social contributions are recorded here, as in the core accounts. In the case of some pension schemes (notably social security pension schemes) it may be necessary to distinguish actual social contributions relating to pensions from social contributions relating to other social risks (such as unemployment).

**Row 2.2:** For defined benefit schemes, employer imputed social contributions are generally measured as the balancing item – any changes in entitlements over the year not included in other rows of the table are captured here. This row would capture any "experience effects" observed where the observed outcome of pension modelling assumptions (real wage growth rate, discount rate) differs from the levels assumed. By construction zeroes are entered in this row for defined contribution schemes.

**Row 2.4:** It relates to the property income earned, or imputed, on the schemes which is routed via the household (or the rest of the world) sector. It should be noted that for all defined benefit schemes including social security, whether funded or unfunded, this property income would be equivalent to the unwinding of the nominal discount rate. In other words the value is equal to the discount rate times the start of year entitlements

Given that the supplementary table must provide a complete elaboration of the changes in pension entitlements over the year, the Task Force felt it necessary to introduce a specific row to deal with the case where actual social contributions to the social security pension scheme are not actuarially based, and therefore there is an imputed contribution (which is not the responsibility of any employer). **Row 3** is solely associated with these imputed transactions of social security pension schemes (other (actuarial) increase of pension entitlements in social security pension schemes). The Task Force observed that in practice the entries in this row might be positive or negative – the negative cases would be observed in a social security scheme where the discount rate is higher than the scheme's internal rate of return<sup>18</sup>, for example, where contributions have been raised above the actuarial required level in order to finance a short-run cash shortfall. This row does not represent cash transfers from (for example) tax revenues, which are seen to be large in some countries, and would be recorded in the core accounts as current transfers between government units if they have no impact on entitlements. In some EU countries governments make transfers to pension schemes which do increase entitlements (for example where transfers are made for specific social groups which are unable to contribute directly), which would indicate that the amounts should be implicitly included in a row 3 figure calculated by difference. This row would capture any "experience effects" observed for social security pension schemes where the observed outcome of pension modelling assumptions (real wage growth rate, discount rate) differs from the levels assumed.

**Row 4** is simply the pension benefits that are paid during the year. Payment of pension benefits has the effect of "settling" some of the pension entitlements included in the opening stock in row 1.

**Row 5** is intended to present the changes in pension entitlements due to contributions and benefits. It is equal to row 2 + row 3 – row 4 less the service charge. This balancing item measured from the non-financial side is conceptually equivalent to that measured from the financial side.

The updated SNA will record financial services produced by all pension schemes, and record these as being paid by scheme members (thus the costs of pension schemes will never be recorded as intermediate consumption of the employer operating the scheme). There has been some discussion about how to represent these financial services, notably from which social contributions should they be resourced. Chart 3.1 therefore shows financial services separate from social contributions, and the eventual supplementary table in the updated SNA will include a separate transactions row for this effect, moving up the row for information currently shown in row 11 of Table 3.4 for output.

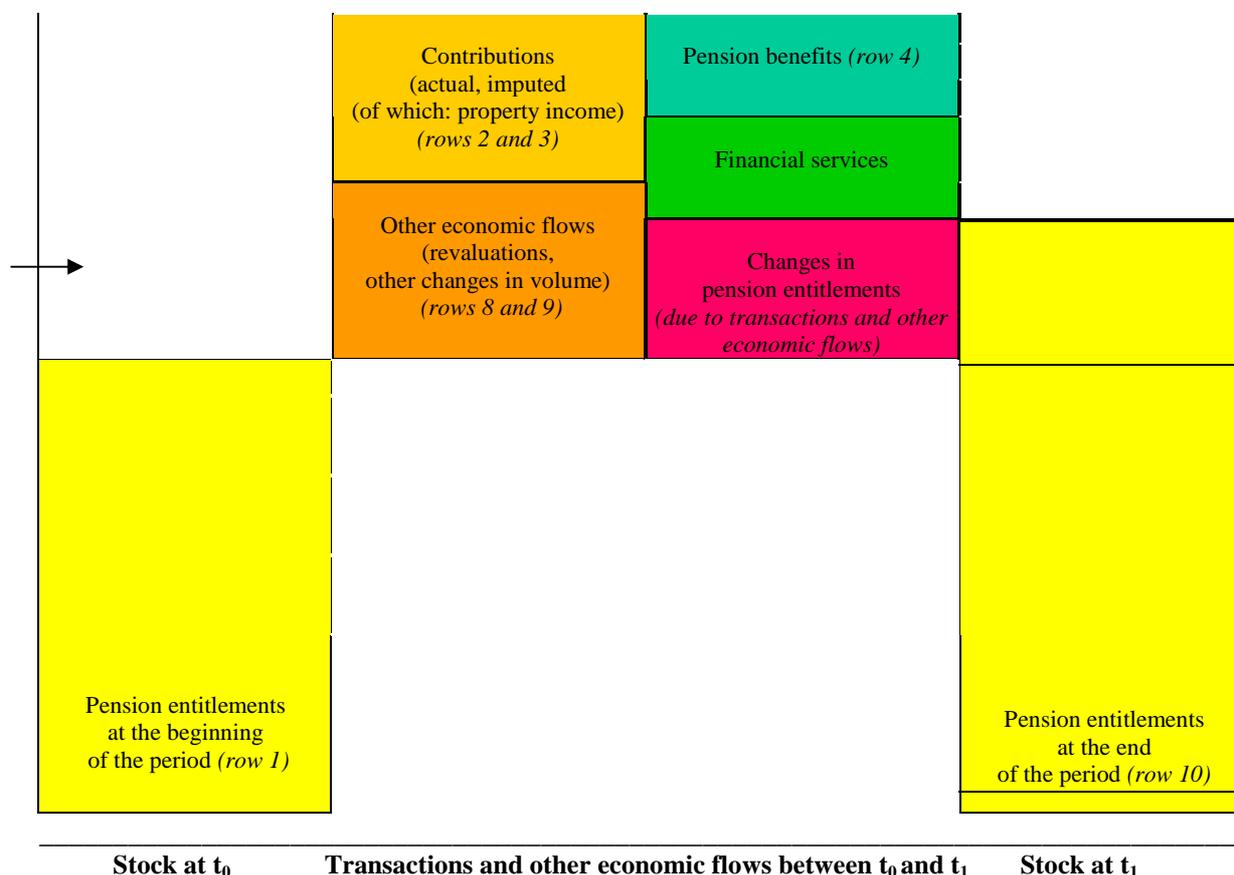
Presenting the data in this way has two big advantages. It means the figures shown as contributions received by employees from their employers are exactly the same as that part of the contributions paid by the employees to the pension fund. Secondly, it is not necessary to show which element of social

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<sup>18</sup> The internal rate of return of a pension scheme is the discount rate that equalises the actual contributions paid and the discounted value of pension entitlements accrued through those contributions.

contributions covers the service fee. (It is the household contribution supplement for a defined contribution scheme and either the employers' or the household contribution for a defined benefit scheme.)

**Chart 3.1: Pension entitlements and their changes**



**Row 6:** It is possible that one unit takes over the responsibility for pension entitlements from another unit. In such a case, two transactions must be recorded. The first is a transfer of pension liabilities from the original sponsor to the new sponsor. Secondly, there may be a transfer in cash or other financial assets to compensate the new sponsor. It is possible that the value of the transfer of financial assets is not exactly equal to the value of the pension entitlements transferred. In that case a third entry is needed in transactions (capital transfers) to correctly reflect the changes in net worth of the two units concerned..

**Row 7** shows the impact of reforms of pension scheme structures on entitlements relating to past service.

**Rows 8 and 9** account for the other economic flows as revaluations and other changes in volume associated with pension schemes in social insurance. The Task Force felt that the detail in these rows

may not be possible to compile for columns A to E<sup>19</sup>, and therefore agreed the principle that the full detail must only be shown for columns G and H (see the table in the next section).

The following table illustrates other economic flows, divided into revaluations and other changes in volume.

**Other economic flows**

Revaluations

*Changes in assumed discount rate*

*Changes in assumed wage developments*

*Changes in assumed price developments*

Other changes in the volume of assets

*Other changes in assumptions and model specifications*

*Other changes*

Revaluations are due to changes of key model assumptions in the actuarial calculations. These assumptions are the discount rate, the wage rate and the inflation rate. Experience effects are not to be included here in principle, though in some circumstances it may not be possible to separate them.

When the demographic assumptions used in the actuarial calculations are changed, since these are not price effects, they are recorded as other changes in the volume of assets.

### **3.2.5. The distinction between transactions and other economic flows**

There were two important issues identified in the distinction between transactions and other economic flows, the recording of wage increases and the recording of pension reforms. They will be covered in the following two sub-sections. In this context the Task Force affirmed the AEG's recommendation that there should be no backward revisions in pension scheme entitlements.

### **3.2.6. The recording of wage increases**

Section 3.3.4 of this report describes the assumptions for wage increases to be adopted in the case of modelling of pension schemes. It distinguishes between the ABO approach and the PBO approach.

The Task Force believes that the impact of wage increases should be reflected in transactions, because awarding a wage increase is a conscious economic decision taken by the employer. Equally the Task Force believes that in concept the ABO and PBO approaches should lead in the long run to the same transactions recorded, even if the timing of those transactions would differ (depending on the demographics of the scheme). Finally the Task Force noted the practice of pension modellers in updating real wage assumptions in a PBO-based pension model every few years or in response to a major restructuring of the workforce. These considerations have the following implications on recording in the supplementary table:

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<sup>19</sup> In some countries even completion of total other economic flows may not be possible for columns A to F.

- i) Differences in the year encountered between assumed and actual wage growth (that is the wage growth part of the "experience effects" or "actuarial effects" when modelling) should be reflected in transactions (employer's imputed social contributions), along with all other experience effects.
- ii) Changes to assumptions of future real wage changes, which would generally be made every few years in response to a general review of pension modelling assumptions or due to a major re-structuring of the workforce, would be recorded as other economic flows (revaluations).

### **3.2.7. The recording of reforms to pension schemes**

Governments are increasingly reforming the pension schemes they sponsor in response to demographic and other factors. Reforms may take the form of a change to the benefit formula, a change in the retirement age, or a change in other scheme provisions.

The Task Force believes that only legally enacted pension reforms should lead to recording in the national accounts, in the estimates of pension entitlements in the year in which legal enactment takes place and subsequently in observed flows. An announcement by a government of its intention to undertake a pension reform is not a sufficient basis to introduce the effects of the reform into national accounts data.

In some cases of reform, the government chooses to leave the rights of existing members untouched and only applies the reformed arrangements to new entrants. In the supplementary table there would be no immediate impact on current pension benefits. The impact would be seen in future measures of pension benefits, in line with the accrued-to-date liabilities definition.

However in some cases the government decides to make reforms which affect the accrued-to-date liabilities for existing members, for example a general increase in retirement age for all members. These types of reforms change the stock of pension entitlements during the year in which they are enacted. This effect must be accounted for in the supplementary table as a flow. It may be very large since it affects current and future pension benefits and, therefore, the entire stock of existing entitlements. The key question discussed by the Task Force was what type of flow should be used.

There was a strong feeling of the Task Force that all reforms should be treated in the same way in the accounts, since to distinguish between negotiated and non-negotiated reforms would not be practicable. Some Task Force members noted that in reducing benefits through an imposed reform, the employer was in effect making an uncompensated seizure (other change in volume). Others noted that the effect of a reform imposed by a third party (for example through the raising of the statutory national retirement age) should not be considered as a transaction.

On balance the majority felt that in general the effects of reforms to pension schemes should be recorded as transactions because of (i) the conceptual argument that changes to pension schemes are

always agreed (changes to government-sponsored schemes are enacted through democratic means by the parliament, workers may leave a scheme if they do not agree with a pension reform), drawing on an analogy with taxes, and (ii) the practical difficulties in distinguishing an agreement from an imposition. The Task Force members felt that the most appropriate transaction to be recorded for changes in accrued to date liabilities arising from past service would be a capital transfer since this would better reflect the one-off nature of the transaction and would also avoid possible unwelcome one-off effects on saving rates, disposable income and GDP which would be the case if transaction is compensation of employees (if a scheme's entitlements were recorded in the core accounts).

The discussion by the AEG on the treatment of pensions in the updated SNA did not go into detail about how the impact of pension reforms on liabilities for defined benefit pension schemes should be recorded. The draft simply proposes that the expectation is that price escalation and other adjustments to entitlements would be covered by holding gains made on the investment of the assets held by the pension fund. Since holding gains and losses are recorded as revaluation changes, it is supposed that the price escalation and other adjustments would also be recorded in the other changes in assets account. It is clear that the Task Force has considered these matters in greater detail and so it is proposed that the AEG also be asked to consider whether greater elaboration in the SNA would be appropriate. Because of timing constraints, such a consultation would have to take place after the forthcoming meeting of the UN Statistical Commission with a view to incorporating any changes needed in the draft SNA in the "white cover" version of the updated SNA to be prepared in the light of the Statistical Commission's recommendations.

### **3.2.8. The items for information**

There are two additional rows in the table which the AEG recommended to be included for the information of users:

Output: Since under the updated SNA output will be recorded for all employer pension schemes (which the scheme's members will consume), this row shows the output by type of scheme. This row will be moved up the supplementary table in the updated SNA, as a result of the agreed treatment of payments for the service (see the discussion in section 3.2.4 above). This will also match the proposed recording in the secondary distribution of income account.

Assets held at the end of the period to meet pensions: A number of users and data compilers would like to show the total assets of pension schemes because this would reflect a member's concern that sufficient assets exist to pay future pensions. The Task Force however does not believe that this is a good measure of the sustainability of the pension scheme (see box 1 in section 3.4.1 below).<sup>20</sup> The Task Force was also concerned that the definition of such assets should be strict enough to exclude those

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<sup>20</sup> Future pension benefits provided by general government are in many cases secured by future social contributions and taxes. Moreover, the valuation of assets is sometimes an issue.

funds which are not reserved for the payment of future pensions in a binding way – for example a government may hold a reserve which is earmarked for demographic changes, without specifying exactly which effect it would be used for. The Task Force believed that the row should be described in a footnote as follows: "This row includes financial and non-financial assets held for the sole purpose of paying future pensions, excluding claims by the pension scheme on its sponsor; an explanation should be provided of which assets have been included."

### **Box 1 : The treatment of pension funds in the context of international accounting standards**

#### ***Private business accounting***

*The international financial reporting standard for pension schemes employee benefits is IAS19 ("Employee benefits"). This standard, as other international standards, is mandatory for the consolidated accounts of listed companies in Europe, with some countries extending its application (whether obligatory or voluntary) to individual accounts and unlisted companies. IAS19 does not distinguish between funded and unfunded pension schemes – it operates from the principle that all schemes should be recorded in company accounts. However IAS19 does distinguish between defined contribution (DC) and defined benefit (DB) schemes, and differentiates the accounting treatment applied: (i) DC schemes imply a cost to the employer in the current period, but the only balance sheet obligations recorded are for employer contributions which are not paid by year-end; (ii) DB schemes imply both a cost to the employer in the current period and balance sheet obligations representing the discounted value of future pension payments.*

*For DB schemes the balance sheet obligations for the pension scheme should be calculated from an actuarial model with the following characteristics: (i) A discount rate equivalent to the market yield at the balance sheet date on high quality corporate bonds (by convention this is normally taken as AA); (ii) The "Projected Unit Credit Method" should be used – the method is equivalent to the Projected Benefit Obligation (PBO) approach described elsewhere in this report; (iii) Valuations should be undertaken regularly and assumptions should be mutually consistent.*

*The accounts would therefore record the following in the income (profit and loss) statement for a company pension scheme: (i) Current service cost (the actuarial estimate of benefits earned by employee service in the period); (ii) Interest cost (the increase in the present value of the obligation as a result of moving one period closer to settlement); (iii) Expected return on scheme assets<sup>21</sup>; (iv) Actuarial gains and losses<sup>22</sup>, to the extent recognised; (v) Past service cost, to the extent recognised; and (vi) The effect of any plan curtailments or settlements (pension reforms).*

*In drawing up IAS 19 there was a widespread fear that recognising actuarial gains and losses fully in the income statement would lead to excessive volatility. Therefore a smoothing process was introduced, whereby only a proportion of actuarial gains and losses would be reflected when actuarial gains and losses exceeded higher and lower bands (known as the "corridor"). Following an amendment in 2004, there is an option to recognise all actuarial gains and losses immediately in the income statement.*

*It should be noted that the International Accounting Standards Board (IASB) has launched a review of IAS 19. A discussion paper is expected in 2008, to be followed by a revised interim standard in 2011, and a more extensive review in a second phase. The main issues to be examined in this first phase are: (i) Presentation and disclosure; (ii) Definition of defined benefit and defined contribution arrangements and accounting for cash balance plans; (iii) Smoothing and deferral mechanisms; (iv) Treatment of settlements and curtailments.*

*At this stage it is too early to say where the first phase will end up, though there is a strong expectation that the "corridor approach" described above will be dropped.*

*For those companies which do not apply IFRS, the picture across Europe appears to be very mixed. In some jurisdictions there is a national standard for business accounting which is similar to IAS 19 (for example the UK),*

<sup>21</sup> This is the source of some controversy because the basis for calculating the expected return on assets is left to the discretion of the company.

<sup>22</sup> Representing the experience effect of outcomes compared to assumptions, and also changes in assumptions between one modelling exercise and the next.

*whilst in others a historical approach continues which can be quite different from IAS 19 (for example in Germany, where German GAAP requires an ABO-type approach and allows a fixed annual discount rate, which many companies interpret as 6%). It is observed that data to be reported by companies for regulatory purposes may be on a different basis from company accounting practice.*

### **Public sector accounting**

*Whilst public accounting in many countries has traditionally been on a cash basis, there has been an observed tendency for public employer pension schemes (not general social security pension schemes) to compile accruals-based accounts, not least for regulatory reasons. These accruals-based accounts appear to be extremely diverse across countries, and even between schemes in the same country, in their accounting basis.*

*At present any public authorities wishing to follow international accounting standards use IAS 19. However the International Public Sector Accounting Standards Board (IPSAS Board) has recently agreed a new public standard to cover employee benefits, which is expected to be published shortly.*

*This new standard is largely based on IAS 19, including the use of the projected unit credit method; however it diverges from IAS 19 in one respect - the selection of the discount rate is left more open, to be based on the yields of either government or corporate bonds. In this context, the IPSAS Board has concluded that the required rate should reflect the "time value of money" and that in some jurisdictions the yield on government bonds would be most appropriate. Public authorities will have to be fully transparent about the choice of discount rate and the rationale for this choice.*

*.The new standard will not have to be applied until reporting periods commencing on or after 1 January 2011. Organisations may nevertheless choose to implement the standard sooner.*

*The standard does not cover reporting by social security pension schemes, which are being considered by the IPSAS Board in a separate study of fiscal sustainability. Where public sector entities rely on the social security scheme to pay post-employment benefits to their employees, they will have to assess whether accounting should be on a defined benefit or defined contribution basis.*

## **3.3. Key assumptions for pension funds accounting**

### **3.3.1. Introduction**

The statistical estimation of defined benefit pension entitlements (for past periods) requires model estimates of the outstanding stocks and the related transactions, revaluations and other changes in the volume of assets. In this context, various key assumptions have to be made before carrying out any empirical work. This refers predominantly to the definition of the pension entitlements to be measured as well as the determination of the discount rate, of the wage growth and the demographic assumptions.

The Task Force therefore concentrated on the definition of pension entitlements and also identified the key three assumptions to be made in an actuarial model for a pension scheme (discount rate, wage growth and demographic data) and these are considered in the following three sections.

It is important to note that other assumptions may be required in order to properly model pension entitlements, notably where the pension benefits rely on indexation formulae. As examples, the Task Force has observed the importance of future employment figures in determining the "points" value of pension entitlements in Germany and the use of GDP as one determinant in Portugal.

In conducting its work on assumptions, the Task Force took careful note of the work of the Ageing Working Group, given that the assumptions underlying these estimates (albeit for sustainability analysis) have been subject to considerable development to ensure cross-country comparability.

It should be noted that national accountants would not normally directly model pension schemes (see section 4) and therefore reliance would be made on the results of other modellers (whether within government or actuaries acting for non-government units). It may not be possible for national accountants to influence other modellers to accept assumptions directly and therefore there is a danger that the assumptions basis for recorded data may vary by scheme. It is often not straightforward to adjust the results of pension models for different assumptions without re-running the modelling.

The Task Force notes it is important for compilers to understand the impact of modelling assumptions, and to ensure their transparency. The Task Force has endeavoured to draw on business and public accounting methods wherever appropriate in developing its recommendations.

The Task Force believes that existing actuarial methods are appropriate – there is no need to invent a specific modelling approach for pensions in national accounts. However in order to assure comparability of data over time and over countries the Task Force felt it necessary to develop general guidelines for the selection of appropriate assumptions.

### **3.3.2. Accrued-to-date liabilities**

Pension entitlements in national accounts refer to a gross liability concept. It means that no assets or accumulated social contributions are taken into account to compile any type of net liabilities. Only pension entitlements due to actual and future pension benefits are covered.

In the pension literature, three concepts of (implicit) pension entitlements have been proposed differentiated by the scope of entitlements included in the estimation: *the accrued-to-date liability concept, the projected current worker and pensioner's liability concept, and the open-system liability concept* (see Box 2).

#### **Box 2: Three concepts of pension entitlements**

*Three different concepts of pension entitlements are distinguished: accrued-to-date liabilities, projected current worker and pensioner's liabilities, and open system liabilities. Accrued-to-date liabilities include only the present value of liabilities arising from already accrued pension entitlements. These are the entitlements due to already paid pension contributions by current workers and remaining pension entitlements of existing pensioners. Projected current workers' and pensioners' liabilities cover accrued-to-date liabilities and also the present value of pension entitlement that will accrue to current contributors due to their future contributions. This means that the underlying assumption for this calculation is that the pension system is closed to any new entrants, while all current contributors can remain in the system and continue to accrue pension entitlements. Open-system liabilities incorporate, in addition to the projected current workers' and pensioners' liabilities, the present value of future contributors' pension entitlements. This estimation is based on the assumption that the pension system will continue under unchanged rules. For practical purposes, the estimation may introduce a time horizon for the calculation of the present value, e.g., fifty years. Alternatively the present value may be compiled over an infinite*

horizon, which requires strong assumptions regarding demographic and economic variables entering the estimation.

*The usefulness of the alternative definitions depends on the specific purpose of the estimation. For example, an assessment of the long-term sustainability of the current pension arrangements should take as a baseline the widest possible estimate of the liabilities. This would point to using the open-system liability concept for this purpose. 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 remaining time horizon of the system.*

From a statistical perspective, only the *accrued-to-date liability concept* is appropriate for national accounts purposes. It includes the present value of liabilities (or assets of households) in the form of pension entitlements arising from already accrued pension rights in the estimate. For example, it covers 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 ex-post pension entitlements, as only the current values of the entitlements are compiled that arise from the already accrued pension rights. Insofar, the method is based on observable past events and transactions, such as membership in the pension system and paid contributions. However, these ex-post pension entitlements rely on a number of assumptions in the modelling process. Probabilities need to be estimated that current contributors may die or become disabled before reaching the pensionable age. It also covers future changes of the payment stream due to any legislation enacted prior to the year for which pension entitlements are being calculated. Finally, the method requires some important assumptions on future developments, notably regarding the discount rate for future pension disbursements.

### **Box 3: Pension entitlements and sustainability analysis**

**This text is reproduced from the European Commission's Public Finance Report 2006.**

*Measures of pension entitlements (also referred to as accrued-to-date pension liabilities) will be useful for economic analyses. They will provide an estimate of the cost of a hypothetical dismantling of the pension system without reneging on accrued entitlements. As measures of the households' implicit wealth, they are also useful to understand changes and differences in the saving and consumption behaviour of the private sector. Those estimates may help assessing pension reforms involving the setting up of a new system for new contributions or new contributors, while maintaining the current system for already accrued entitlements.<sup>1)</sup>*

*However, as the following examples illustrate, pension entitlements are not an indicator of long-term sustainability of pension systems or of public finance. Large pension entitlements do not imply unsustainable systems, and small pension entitlements do not mean that pension systems are sustainable. The examples show that what is relevant in the sustainability analyses is not the level of payments or of pension entitlements, but their dynamics.<sup>2)</sup>*

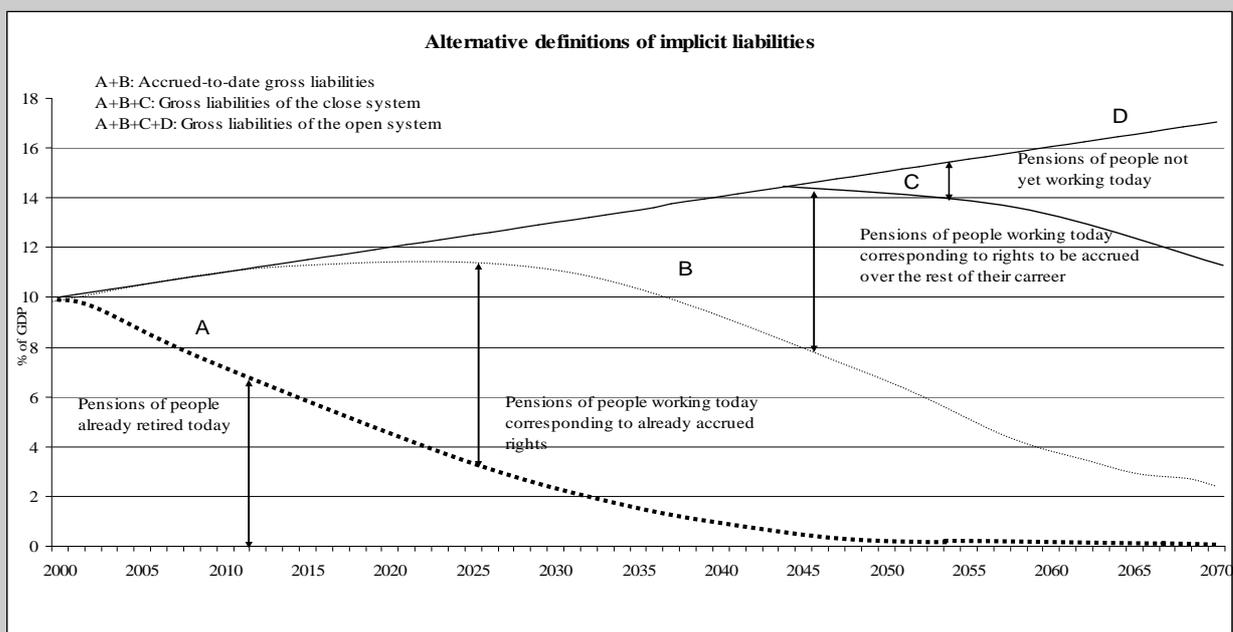
*In a mature pay-as-you-go (PAYG) scheme where the average pension evolves in line with the average wage in the economy and the age and entitlement structure is constant, total pension expenditure increases in line with total wages. Maintaining the contribution rate at its current level is sufficient to ensure that contributions exactly match the pensions of retirees, today and in the foreseeable future. The system is therefore sustainable, i.e. there is no need to change the pension system (increasing the retirement age or decreasing the average pension) or to*

find additional financing (by increasing contribution rates). Yet, the ratio-to-GDP of entitlements can be very large, above 200% or 300% of the yearly GDP.<sup>3)</sup>

- Assume that a country establishes a new unfunded pension scheme, financed by transfers from the government budget. Workers accumulate pension entitlements according to the length of their working life since the scheme is established. In the first years after the scheme is created, workers have accumulated very small entitlements. Statisticians would, therefore, record hardly any pension entitlements. However, as workers accumulate more and more pension rights with time, the pension entitlements and the effective pension payments will increase substantially. To finance those payments, the general government may have to increase taxes, to reduce other expenditure or issue debt. The scheme may quickly become unsustainable, though pension entitlements will be initially very small.

Figure 1 illustrates how pension entitlements are a component of a broader definition of implicit liabilities and represent a fraction of pensions to be paid in the future. The upper solid line shows a projection for pension expenditure. Given demographic developments, pension expenditure is projected to increase from an illustrative 10% of GDP in 2000 to above 16% of GDP by 2070. Those payments can be divided in four groups: For each year, the line A corresponds to the pensions to be paid to people already retired today. Given the mortality of pensioners, this group of payments is expected to progressively decline in importance and will become zero when the last people already retired today dies. The distance between lines A and B corresponds to pensions to be paid in the future to people working today, in relation to the entitlement they have already acquired until now. This share of payments will increase for several years, as people currently working will progressively retire; it will then decrease according to mortality. The distance from B to C corresponds to pensions to be paid to people already in the labour market, in relation to the entitlements they will accumulate from now on until their retirement. Finally, the distance from C to the solid line in the top right of the graph corresponds to pensions to be paid in the far future to people that are not yet in the labour market, some of them not even born.<sup>4)</sup>

**Figure 1**



Pension entitlements that will be measured by national accountants correspond to the integral below line B, taking into account an appropriate discount rate. In contrast, the concept that is relevant for assessing sustainability corresponds to the integral of the area below the solid line, together with the related revenues, taking also into account a discount rate.

1) On the usefulness of estimates of pension liabilities, see Holzmann et al. (2004).

2) See Franco (1995) for a discussion on how pension liabilities are inappropriate to assess sustainability and may often be misleading. Blanchet and Ouvrard (2006) also show with the help of numerical simulations in realistic circumstances that accrued-to-date pension liabilities may even decline at the same time sustainability problems loom in the horizon.

3) In a country with a mature PAYG system and a stable demographic structure, where retirees receive a pension for 20 years after they retired and where pensions paid amount to 10.5% of GDP, the stock of accrued-to-date liabilities is 250% of GDP if the discount rate is 1.5% above growth rate and 320% of GDP if the discount rate is equal to the growth rate of the economy.

4) The area below the solid line a line C is often characterised as "close-group". It corresponds to pensions to be paid to current members of pension schemes (retirees and workers) under the assumption that the rules of the pension schemes are unchanged, but that there will be no new entrants in the scheme.

### **3.3.3. Discount rate**

The discount rate applied to estimates of future pension benefits in the case of accrued-to-date liabilities is one of the single most important assumptions to be made in the modelling of pension schemes, since its accumulated impact over many decades can be very large. The discount rate can be seen as equivalent to the expected risk-free rate of return on assets (whether actual assets or imputed) held by a pension scheme. In case of pension entitlements to be paid in the future the discount rate can also be seen as the cost of capital in a sense that the future payments have to be financed by government (via the usual sources: (a) net acquisitions of liabilities (mainly loans and debt securities); (b) net sales of assets; and (c) government revenue. A discount rate might be derived from this (cost of financing). The Task Force has followed the latter approach.

#### **3.3.3.1. International Accounting Standard 19**

The most appropriate choice of the discount rate has been discussed in many fora over many years. In the business accounting world a decision has been made to refer to market yields at the balance sheet date of "high quality corporate bonds" (IAS 19). This was a deliberately conservative selection, since observed rates of return on pension funds which have a diversified portfolio of assets including equity (not risk-free) have been higher on average over past years.<sup>23</sup> It appears that "high quality" is being defined operationally by business accountants as bonds with an "AA" or equivalent rating. Where the markets for corporate bonds are thin, it is possible to use yields on government bonds.<sup>24,25</sup>

#### **3.3.3.2. International Public Sector Accounting Standards Board**

Discussions on the IPSAS for employee benefits under development have focussed on three possible choices for a discount rate to apply to public sector pension schemes: (i) Option 1 – Discount rate based on the yield on government bonds; (ii) Option 2 – Discount rate based on the yield on high quality corporate bonds (as for private businesses); and (iii) Option 3 – Risk-free rate reflecting the time value of money, but no exact specification.

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<sup>23</sup> This potentially creates an interesting effect for funded pension schemes which have diversified portfolios in that, on average over time and assuming that contributions are actuarially-based, their accumulated reserves will turn out to be greater than their obligations to pay pensions. It also may not reflect full consistency with other assumptions used, for example the choice between ABO and PBO approaches.

<sup>24</sup> There have been suggestions that this position might be changed, however the IASB's latest review project on IAS19 (part of the convergence project with US standards) has just commenced and a first discussion paper is expected only towards the end of 2007.

<sup>25</sup> Ideally, the yield of (very) long-term government bonds or perpetual bonds should be applied. This yield represents the financing costs for government to extinguish government pension entitlements.

The agreed way forward by the IPSAS Board (as described above) is to use a rate reflecting the "time value of money" which could be the yield on government bonds, on high quality corporate bonds (as in IAS 19) or a yield on another financial instrument (which appears to be aimed at derivatives relating to bonds). Entities would be required to disclose the rate that had been used and related information.

### **3.3.3.3. Choosing a discount rate for estimation purposes**

There are two further questions to consider: (i) *Can the discount rate used vary country by country?* The answer is almost certainly yes, since the change in value of money over time certainly differs. Nevertheless some might take the view that use of yields on bonds denominated in euro might be reasonable for euro area Member States. Disclosure of the methods used in metadata would be important; (ii) *Should the same discount rate be used for all government-sponsored pension schemes (including social security pension schemes) at whatever level of government?* Different government units at different levels (central, state, and local) may issue debt securities with different yields. The IPSAS Board took the view that the same discount rate should be used for all levels, since the desired result should approximate risk-free yields.

In a paper prepared by the World Bank<sup>26</sup> simulations have been carried out assessing the impact of different discount rates on the estimates for implicit pension debt (IPD). Particularly, the discount rate and the wage growth assumptions are seen as the two key assumptions for the estimation of IPD as well as the major elements of the pension benefits rule. In general, the higher the discount rate is (c.p.), the lower will be the current value of IPD. Moreover, it is the difference between the discount rate and the assumed indexation parameters (wage growth or inflation rate) which plays a significant role rather than the discount rate alone in determining the level of the accrued-to-date pension liabilities.

### **3.3.3.4. Recommendations of the Task Force**

The recommendations of the Task Force members on the choice of a discount rate are the following:

- (i) One **single rate** might be used for all **euro area countries** facilitating the comparability of the estimates within the euro area. Otherwise, diverging rates might be applied reflecting the different financing costs for extinguishing pension entitlements in the various countries. Nevertheless, given the converging yet differing conditions between the euro area and the non-euro area EU countries, it might be advisable to distinguish between these two groups of countries. The euro area countries would then use a single rate or similar rates, and the non-euro area EU countries would use an appropriate rate for their circumstances;

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<sup>26</sup> Holzmann, Robert, Robert Palacios and Asta Zviniene (2004): *Implicit Pension Debt: Issues, Measurement and Scope in International Perspective*, Washington, D.C.; available at <http://siteresources.worldbank.org/SOCIALPROTECTION/Resources/SP-Discussion-papers/Pensions-DP/0403.pdf>.

- (ii) Subject to ongoing discussions by standard-setters, the **discount rate level** preferred is the yield on central government bonds (or, exceptionally, high quality corporate bonds). These should be of a maturity of the same order as the entitlements (e.g. 10 years or longer)<sup>27</sup>. Residual maturity should be chosen. The reasoning applied to select the discount rate should be disclosed. The discount rate from a chosen approach may change (for example Table 3.5 provides an overview of the yields of 10-year euro area benchmark government bonds since 2004) which would lead to revaluation effects in the accounts. However the choice of government bonds or corporate bonds should be stable;
- (iii) The **same discount rate shall be used for all government sponsored pension schemes** (including social security pension schemes);
- (iv) Given the large impact of the discount rate on the overall amount estimated, it seems highly recommendable to conduct **sensitivity analyses** using several different discount rates (or discount rate differentials)<sup>28</sup> when choosing a discount rate. This approach was also suggested by Holzmann et al. (2004); and
- (v) The possibility to adopt the **projected real GDP growth rate** as a discount rate is not recommended. As reflected in the EC Report on ageing the projected GDP data vary significantly by country. Accordingly, the option of using a single rate, at least for all euro area countries, would be inappropriate if the GDP growth rate were adopted as a discount rate.

**Table 3.5: Long-term general government bond yields**

% per annum; period averages

10 years (original maturity)	2004	2005	2006	Dec 2006	Oct 2007
Nominal	4.14	3.44	3.86	3.90	4.40
Real	2.00	1.25	1.68	1.98	1.80

Source: ECB.

### 3.3.4. Wage growth

Defined benefit pension schemes apply a formula to the member's salary (whether final salary, an average of a period of years or lifetime earnings) to determine the level of pension. It is therefore known that the final pensions paid will be affected by the growth of members' salaries (notably through promotions/career progression).

It is therefore appropriate to consider what assumption might be made for the future development of wages. The assumed long-term development of wages must also correspond with the observed discount rate. Both variables are, in the long-term, not independent of each other.

<sup>27</sup> The *yield curve* shows the relation between the discount rate and the time to maturity of the bond in a given currency. The technical compilation guide will discuss this in further detail.

<sup>28</sup> This is the difference between the wage growth and the discount rate.

One approach is to assume that there is no future wage growth (whether nominal or real) – the ABO method. The ABO method is equivalent to members' pensions being determined on the basis of their current salary. The alternative approach is to make an explicit non-zero assumption for wage growth – the PBO method – which would take account expected promotions and other real or nominal wage growth factors. The Task Force has nevertheless observed a number of possible variants in the application of the ABO and PBO methods (see Box 3) depending on how price and wage effects are treated.

The Task Force has discussed these various variants of both ABO and PBO approaches. One important factor has been the treatment of indexation arrangements on pensions, whereby the pension to be paid will increase in line with nominal wage growth after retirement. Many members of the Task Force considered that in an ABO approach there would need to be a non-zero assumption made for wage growth applied to modelling pension entitlements of retired members. However it was noted that an alternative approach, which would assure consistent treatment of wage effects for current employees and retired members was considered to be more appropriate. The discussion and the long list of possible approaches show that only a unique definition of ABO and PBO can assure comparability between countries. Due to heterogeneous treatment this aim can't be reached for pension entitlements of occupational pension schemes. But for government pension schemes (columns G and H) where model calculations are undertaken one common definition of entitlements could and should be chosen.

#### **Box 4: ABO and PBO approaches**

Whilst in concept the difference between ABO and PBO approaches could be seen as straightforward, in practice there are a number of possible interpretations of these approaches. The following provides a possibly non-exhaustive list:

##### **ABO**

- No future indexation of entitlements (non retired scheme members) and pensions
- Price indexation of entitlements up to retirement only
- Price indexation of entitlements up to retirement and of pensions
- No indexation of entitlements up to retirement, but price indexation of pensions
- No indexation of entitlements up to retirement, but wage indexation of pensions
- Price indexation of entitlements up to retirement and wage indexation of pensions

##### **PBO**

- No future indexation of pensions
- Price indexation of pensions
- Wage indexation of pensions

As reported in the Interim Report to the CMFB, the Task Force chairmen wrote to the co-chairmen of the IMF/BEA Task Force on pensions to investigate the reasons why the IMF/BEA Task Force had expressed a preference for the ABO method. It has become clear that there are advantages and disadvantages to each method, and both could be dealt with in the national accounts and in the supplementary table. The updated SNA will mention both methods, without choosing between them.

Nevertheless the Task Force has established that the choice between the ABO and PBO will have a very material effect on the estimates of stocks and flows of pension entitlements and continues to believe it is preferable that national accountants in Europe adopt one single method.

The Task Force members have concluded that the PBO method will in general deliver the most economically meaningful estimates of pension entitlements. The PBO approach should reflect the legal national (indexation) rules of the pension scheme. It could be expected that this procedure leads to more comparable results across countries, since it treats different arrangements for example for pension reforms in a more harmonised way. The Task Force therefore recommends that the PBO method be applied to general government sponsored pension schemes.

The Task Force further considered the possible implications for international comparability of pensions data if some countries or regions adopted an ABO-based approach, or in the case where national data sources were available only on an ABO basis for some pension schemes. The Task Force accepted that adjusting ABO-based to PBO-based data (or vice-versa) for non-government pension schemes would not normally be possible, unless the non-government body had decided to show both approaches in the notes to its accounts. Nevertheless there may be more scope to adjust data available from government, through close co-operation with the appropriate authorities. Some Task Force members felt that there would be merit in the presentation of both ABO and PBO-based estimates (albeit giving prominence to one measure), so that users would be fully aware of the implications of the different approaches. Other Task Force members felt that this could lead to potential confusion for users when presented with two different sets of data.

### **3.3.5. Demographic data**

Future pension payments are subject to the demographic effects, in terms of the age/ gender balance of members and their longevity. Demographic tables are already well established for the modelling of pension and life insurance schemes.

In the case of employer pension schemes, the membership of the scheme is well defined and therefore the data should in principle be accessible. Many pension scheme models operate on the basis of grouped cohorts of members, and the data appear to be readily accessible for government schemes. In the case of social security schemes, recourse might be made to general population data if no specific data on social security membership (which might be a sub-set of the general population) are available.

In the use of longevity (mortality) tables, the Task Force proposes that gender-specific tables be used, and (where the data exist reliably) specific mortality tables relating to the group of employees covered. Some Task Force members noted the existence of a difference in longevity between public employees and the general population (with public employees demonstrating consistently higher longevity). In a similar vein the Task Force noted that longevity of members receiving a disability pension might be

significantly lower than for other members and therefore this group might be modelled with different longevity assumptions, though this may not generally be practicable.

The Task Force noted that longevity assumptions should include the improvement of longevity over time, a trend noted over many years. This improvement might be modelled in a very general way – a straight-line increase whose slope may vary for groups of future years. This should take account of existing projection exercises where it can be envisaged that significant empirical work has fed into the assumptions.

The Ageing Working Group has decided to base its work on the harmonised population projections prepared by Eurostat; therefore, the Task Force believes that a similar approach in national accounts would improve the cross-country comparability of the estimates. In general, the Task Force members expressed the opinion that these assumptions shall be based as far as possible on the comparable demographic data compiled by Eurostat (through the EUROPOP exercise) for each country.

In practice the longevity (mortality) tables used by actuaries in modelling estimates for employer pension schemes are unlikely to be fully in line with the EUROPOP exercise. Some actuaries may model longevity themselves (particularly for projected future improvements), whilst others may use standard tables available from national institutions.

As noted in the introductory section above, the modelling of some pension schemes may involve the use of demographic assumptions other than longevity, for example future fertility rates, labour participation rates or migration rates in the case where the pension benefit or indexation formula is based on a "dependency ratio" or similar type of approach.

The Task Force discussed the treatment of early retirements, which are available in many (though perhaps a declining number) of pension schemes. Where early retirement within a scheme is actuarially neutral, modelling would be unaffected. Non-actuarially neutral early retirements could have an effect, and these could be expected to be a common case given the way in which different interest rates are usually applied at early retirement, however there were some doubts that this would be significant in aggregate. A number of Task Force members stressed the importance of modelling early retirement behaviour, particularly where a reform lifts the future pensionable age.

## 4. Empirical work

### 4.1. Introduction

The main work of the Task Force in the second half of 2007 was to model and estimate pension scheme data for the countries represented in the Task Force and to investigate the practical issues which arise, thereby generating useful guidance for countries not represented in the Task Force. Such work referred especially to those defined benefit schemes for government employees and of social security pension schemes whose entitlements will only be recorded in the supplementary table.

The statistical estimation of the corresponding government pension entitlements requires the modelling of the outstanding stocks and the related transactions, revaluations and other changes in the volume of assets. From a statistical perspective, only the *accrued-to-date liability concept* is appropriate. The method is mainly based on observable past transactions and other flows, such as the duration of membership in the pension scheme, the social contributions paid and the pension benefits received. For consistency purposes, the historical data included in the European Commission study on ageing was used to the maximum extent.<sup>29</sup>

As for all national accounts data, the data are ex-post observations and not forecasts. The current values of the liabilities reflect the already accrued pension rights. For the calculation of the pension entitlements arising from already-paid pension contributions by current employees and the remaining pension entitlements of existing pensioners, actuarial estimates are to be applied, as used by insurance corporations and pension funds. Several issues emerged in the context of the empirical work: (a) how to specify pension reforms; (b) how to model the ABO approach, the PBO approach or a mix of both approaches to value pension entitlements; (c) how to choose appropriately the exogenous variables like the discount rate and the wage growth.

### 4.2. A three-step procedure

While country-specific pension models may include specific details of the national pension schemes, they lack a common structure and often common assumptions that are needed for cross-country comparisons. On the other hand, to date cross-country estimates of the pension entitlements rely on stylised presentations of the pension scheme(s) under investigation, and do not always take account of specific country features.

As a consequence, a three-step procedure has been applied:

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<sup>29</sup> European Commission (2006): The impact of ageing on public expenditure: projections for the EU25 Member States on pensions, health care, long-term care, education and unemployment transfers (2004-2050).

- 1) National models have been used to derive corresponding national accounts data of stocks and flows for government employer pension schemes and social security pension schemes;
- 2) Countries have been encouraged to develop their own benchmarking models within established international pensions modelling software (for example, the PROST software developed by the World Bank); and
- 3) The Task Force Secretariat has modelled the corresponding pension entitlements of the EU countries represented in the Task Force based on harmonised assumptions as specified in a pension model developed by the Research Center for Generational Contracts of the Freiburg University.

### **4.3. National models**

So far only DE (for the social security pension scheme), ES (for the social security pension scheme and for the civil service pension scheme), FR (for the social security pension scheme and for the civil service pension scheme), NL (for the social security pension scheme) and the UK (some of the most important government-sponsored defined benefit employer pension schemes) have provided estimates based on national models. These estimates are done by using individual pension entitlement data available from the corresponding pension schemes and are based on specific model assumptions as often legally required (a specific discount rate, other assumptions based on national accounting standards or social legislation, e.g. PBO in the case of FR, ES and the UK, ABO and PBO in the case of DE). Insofar, the results derived from these national models are usually not comparable across countries. As a consequence the Task Force considered to ‘cross-check’ these results with the outcomes of benchmark models as developed by the World Bank and by the Research Center for Generational Contracts of the Freiburg University.

### **4.4. Benchmark pension model PROST**

The benchmark pension model PROST developed by the World Bank estimates future trends of the pension scheme and compares the outcome under different pension reform options. The input data consist of demographic data (population growth, life expectancy) and the pension scheme data (contributors, retirees, pension payments, gross earnings of contributors). Crucial parameters for the estimation and, hence, for the sensitivity of the results are the discount rate and the wage growth rate. Additionally, the income distribution, indexation and years of service matter. All estimates derived from the World Bank model are based on the PBO valuation approach.

The Task Force had organised a training course in the PROST software led by a World Bank pension expert in February 2007. As result various Task Force members received a license to apply the software for their own country data (see Annex 1). So far estimates have been derived with PROST by four countries, CZ, DE, FR and PL. The results of these estimates are described in the country sections.

#### **4.5. Benchmark pension model of Freiburg University**

The benchmark pension model developed by the Research Center for Generational Contracts of the Freiburg University projects, first, the population and the average payments of existing and new retirees. Second, estimates of the pension entitlements are provided for one ABO and one PBO valuation method. The two valuation methods used in the Freiburg model are as follows: In the case of ABO the pension entitlements only rise with future inflation. The PBO is based on the principle that the extrapolation of pension follows the indexation rule of the respective pension scheme. This rule may be based on a price indexation, a wage indexation or a mix of both.

At least, data sets have to be provided on the population by age and gender, the pension payments and on gross earnings by age and gender. To calculate the pension entitlements the parameters are taken into consideration such as the required years of service and the indexation of pension payments.

For comparison purposes the Task Force Secretariat has coordinated detailed modeling exercises with the pension model of Freiburg University as a follow-up of the June 2007 CMFB interim report since summer 2007. These modeling exercises have been carried out by the Research Center for Generational Contracts of the Freiburg University. To undertake the modeling work for the countries, various sets of input data have been provided by the Task Force during summer 2007. The required data input with time series up to 2006 refer to the pension schemes which might be recorded only in the supplementary table. These schemes are in any case all social security pension schemes, but also government-sponsored defined benefit employer pension schemes (like for civil servants).

The aim was to cover all ten countries represented in the Task Force, namely CZ, DE, ES, FR, IT, HU, NL, PL, SE and the UK. For the time being, estimates are available for government-sponsored defined benefit employer pension schemes in DE, FR and PL, and for social security pension schemes in CZ, DE, ES, FR, HU, NL, PL and SE. No estimates could be provided for pension schemes in IT because no input data were transmitted so far. The UK has indicated that it does not wish to participate in this exercise as published actuarial estimates of the relevant pension schemes already exist.

## 5. Country studies

### 5.1. Presentation of model estimates following the three-step approach

For the country studies all available estimates are presented as provided from national models as well as from the two benchmark pension models – PROST and Freiburg University.

### 5.2. Data input and basic model assumptions

For the estimation of pension entitlements the data input and some basic model assumptions matter. The main input data for the three models consist – ideally – of individual data for the pension scheme, e.g. the social contributions, the pension benefits and the number of contributors and beneficiaries. The data input should be disaggregated by gender and type (old age, disabled and survivors). Demographic data are also needed. National models are usually specified based on individual data sets, while the benchmark pension models are based on aggregated data (cohorts). Due to their size, complexity and also due to the legal and the accounting framework national models are usually run on the basis of one valuation method, ABO or PBO. Alternative calculations are difficult to be carried out. While the PROST model is only based on the PBO valuation method, the Freiburg model allows running both, the ABO and the PBO valuation methods.

To check the robustness of the results the sensitivity analyses have been carried out by changing some basic model assumptions. Most dominant may be the impact of changes in the discount rate and in the wage growth rate. It is also reasonable to carry out comparable sensitivity analyses under the two different valuation methods (ABO and PBO) and under different demographic scenarios. The impact of the different model assumptions are measured as the ratio of relative changes in form of elasticities  $((y(1) - y(0))/y(0)) / ((x(1) - x(0))/x(0))$ .

The models allow providing such sensitivity analyses by varying basic model assumptions, e.g. the discount rate and wage growth rate. For this report sensitivity analyses have been carried out with the Destatis model and the Freiburg model

### 5.3. Structure of the country files

The country estimates are described in the following way:

- a) Main characteristics of social insurance (based on information received via the questionnaire)
- b) Estimates of pension entitlements in social insurance (government employee defined benefit schemes and social security pension schemes)
  - Data input and model assumptions

- Estimation of pension entitlements and corresponding flows
  - Sensitivity analyses
- c) For national models, the World Bank model and the Freiburg University model

#### 5.4. Country estimates – overview of the results

Most Task Force members undertook some *modelling* of selected government-sponsored pension schemes, and explored the issues to be addressed when completing the supplementary table. In a few cases the World Bank's PROST software was used to provide a helpful benchmark, although it is not expected that this software would be widely used in future national accounts compilation. In addition experts from the Research Center for Generational Contracts of the Freiburg University have worked with the Secretariat and the Task Force members to compile estimates for selected government-sponsored pension schemes (notably social security pension schemes) using the 'Freiburg model'.

The two tables below present a summary of the preliminary results for stocks of pension entitlements obtained from the various approaches, both in national currency and as a % of GDP. It must be stressed that these results are very much indicative and in most cases would need to be reviewed before being made available. Nevertheless the results show that the pension entitlements are very substantial, particularly for social security pension schemes whose entitlements may exceed 300% of GDP in some countries.

Table 5.1 refers to results which have been compiled on national level and with the Freiburg model for some (unfunded) government employee pension schemes in Germany, Spain, France, the Netherlands and Poland. Both, the ABO valuation method and the PBO valuation method have been applied. The data for Germany, Spain, France and Poland show the pension entitlements of general government vis-à-vis civil servants, the data for the Netherlands the pension entitlements of the military fund.

**Table 5.1: Pension entitlements for government employee pension schemes**  
(column G of the supplementary table)

Country	Year	Model	Wage growth	Pension entitlements	
				In billions national currency	as a percentage of GDP
Germany	2006	Freiburg	ABO	942	41
			PBO	1,129	49
Spain	2006	National	PBO	223	23
France	2006	National	PBO	941	53
			Freiburg	ABO	902
		Freiburg	PBO	1,093	61
Netherlands	2006	Freiburg	ABO	20	4
			PBO	24	5
Poland	2006	Freiburg	ABO	260	25
UK	2004-2005	National	PBO	531	45

A relatively broad range of estimates has already been made available for pension entitlements of social security pension schemes (Table 5.2). Estimates have been carried out by using the national models (Germany, Spain, France and Sweden), by using the World Bank model PROST (Germany, France and Poland) and by using the Freiburg model (Czech Republic, Germany, Spain, France, Hungary, the Netherlands, Poland and Sweden).

The assumptions made in the Freiburg model were identical across countries (3% real discount rate, 1.5% real wage growth), whereas national models adopted different assumptions. It is clear from the modelling work that the impact of the choice between ABO and PBO approaches for the treatment of the real wage growth is substantial (PBO approaches lead to higher stocks of pension entitlements, often by a factor of 10-20%).

**Table 5.2: Pension entitlements for social security pension schemes**  
(column H of the supplementary table)

Country	Year	Model	Wage growth	Pension entitlements	
				in national currency	as a percentage of GDP
<b>Czech Republic</b>	2006	Freiburg	ABO	5,231	162
			PBO	6,474	200
<b>Germany</b>	2004	National	ABO	4,168	186
			PBO	5,669	253
	2005		ABO	4,136	185
			PBO	5,268	235
	2006	Freiburg	ABO	5,386	232
			PBO	6,464	278
2005	World Bank	PBO	6,710	289	
<b>Spain</b>	2006	National	PBO	2,349	240
		Freiburg	ABO	1,969	201
			PBO	2,333	238
<b>France</b>	2005	National	PBO	5,623	327
	2006	Freiburg	ABO	4,225	247
			PBO	5,248	293
		World Bank	PBO	5,721	319
<b>Hungary</b>	2006	Freiburg	ABO	54,272	228
			PBO	65,220	275
<b>Netherlands</b>	2006	Freiburg	ABO	690	129
			PBO	872	163
<b>Poland</b>	2006	Freiburg	ABO	2,695	255
			PBO	3,037	287
		World Bank	PBO*	2,579	243
			PBO**	464	44
<b>Sweden</b>	2002	National	ABO	5,729	242
	2003			5,984	243
	2004			6,244	243
	2005			6,461	242
	2006			6,703	236
	2006	Freiburg	ABO	4,760	168
	2006			PBO	5,620

\* FUS: Social Insurance Fund

\*\* FER: Disability and pension Fund (farmers)

## 5.5. Czech Republic

### 5.5.1. Main characteristics of social insurance

There is one general social insurance pension scheme in the Czech Republic, a social security pension scheme managed by the Czech social security administration. Social contributions are revenues of the state budget and pension benefits are paid from the state budget. As the Czech social security pension scheme covers the entire population, there are no separate pension schemes established for civil servants. Schemes related to soldiers, police, judges and ‘managed by the corresponding ministry’, i.e. the ministry of defence, the ministry of justice and the ministry of interior, are also included.

At end-2006, the social security pension scheme covered 5 million active members comprising all employees and self-employed persons (Table 5.3). About 3 million pensioners participated in the scheme. The non-general government sponsored schemes covered about 3 million active members and 2 million pensioners.

**Table 5. 3: Participants in social insurance pension schemes**  
End 2006, millions

Item	Recording Sponsor	Core national accounts					Non-core national accounts		Total
		Non-general government			General government				
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>		
				Defined benefit schemes	Defined benefit schemes				
Active members			3.0					5.00	
Pensioners			2.0					3.00	
Of which: Deferred pensioners <sup>4)</sup>									
Pensioners receiving	Spouse pensions							0.70	
	Child pensions							0.05	
	disability/invalidity/incapacity pensions							0.60	

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.5.2. Estimates of pension entitlements in social insurance

So far no national estimates of the pension entitlements accumulated by the social security pension scheme have been carried out. However, some benchmark calculations have been undertaken based on a model developed by the Freiburg University. These calculations are based on harmonised model assumptions and on input data supplied by the Task Force member. The model firstly, projects the population and the average payments of existing and new retirees. Secondly, both ABO and PBO approaches can be taken into consideration to estimate the accrued-to-date liabilities.

Table 5.4 provides such test results for the year 2006. They have been carried out by using both valuation methods, ABO and the PBO.

**Table 5.4: Estimation of pension entitlements and corresponding flows**  
2006, CZK billions

Relations	Row number	Recording		Non-core national accounts	
		Sponsor		Social security pension schemes	
		General government		H	
		Column number		ABO	PBO
<b>Opening balance sheet</b>					
	1	Pension entitlements		4,756	5,895
<b>Transactions</b>					
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes		527	586
	2.1	Employer actual social contributions		201	201
	2.2	Employer imputed social contributions			
	2.3	Employee actual social contributions		76	76
	2.4	Employee imputed social contributions/ property income		250	309
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes		221	266
	4	Pension benefits		273	273
2 + 3 – 4	5	Change in pension entitlements due to social contributions and pension benefits		475	579
	6	Change in pension entitlements due to transfers of entitlements between schemes		0	0
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)		0	0
<b>Other flows</b>					
	8	Revaluations <sup>1)</sup>		0	0
	9	Other changes in the volume of assets <sup>1)</sup>		0	0
<b>Closing balance sheet</b>					
1+5+6+7+8	10.1	Pension entitlements		5,231	6,474
	10.2	Pension entitlements (in % of GDP)		162	200

Source: Research Centre for Generational Contracts, Freiburg University.

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of key model assumptions as indicated in Table 5.5.

**Table 5.5: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%

2006, CZK billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	6799	30.0%	<b>-0.31</b>	<b>0.03</b>	8475	30.9%	<b>-0.35</b>	<b>0.13</b>
1.0%	1.5%	6877	31.5%	<b>-0.31</b>	<b>0.05</b>	8859	36.8%	<b>-0.36</b>	<b>0.18</b>
1.0%	2.0%	6956	33.0%	<b>-0.31</b>	<b>0.03</b>	9272	43.2%	<b>-0.37</b>	<b>0.14</b>
2.0%	1.0%	5895	12.7%	<b>-0.42</b>	<b>0.03</b>	7219	11.5%	<b>-0.47</b>	<b>0.12</b>
2.0%	1.5%	5959	13.9%	<b>-0.42</b>	<b>0.04</b>	7518	16.1%	<b>-0.48</b>	<b>0.16</b>
2.0%	2.0%	6024	15.2%	<b>-0.42</b>	<b>0.03</b>	7838	21.1%	<b>-0.50</b>	<b>0.13</b>
3.0%	1.0%	5178	-1.0%	<b>-0.50</b>	<b>0.03</b>	6238	-3.6%	<b>-0.57</b>	<b>0.11</b>
<b>3.0%</b>	<b>1.5%</b>	<b>5231</b>	<b>0.0%</b>	<b>-0.51</b>	<b>0.04</b>	<b>6474</b>	<b>0.0%</b>	<b>-0.58</b>	<b>0.15</b>
3.0%	2.0%	5285	1.0%	<b>-0.51</b>	<b>0.03</b>	6726	3.9%	<b>-0.60</b>	<b>0.12</b>
4.0%	1.0%	4599	-12.1%	<b>-0.34</b>	<b>0.03</b>	5460	-15.7%	<b>-0.37</b>	<b>0.10</b>
4.0%	1.5%	4644	-11.2%	<b>-0.34</b>	<b>0.04</b>	5649	-12.7%	<b>-0.38</b>	<b>0.14</b>
4.0%	2.0%	4690	-10.3%	<b>-0.34</b>	<b>0.03</b>	5850	-9.6%	<b>-0.39</b>	<b>0.11</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.6. Germany

### 5.6.1. Main characteristics of social insurance

In Germany, social insurance pension schemes are dominated by the social security pension schemes (predominantly statutory pension insurance, but also farmers pension insurance) with 34.4 (0.3) millions active members and 25.2 (0.62) millions pensions at end-2006<sup>30</sup>. Thereof, about 7.5 (0.3) millions pensions are paid to spouses, child dependents and for disability. As some pensioners have entitlements for multiple pensions, the number of (unique) pensioners in the statutory pension insurance is substantially lower (19.6 million pensioners). Social insurance sponsored by general government also covers benefits for government employees. There are two pension systems considered, the pensions of civil servants with 1.9 million active members and 1.4 million pensions payable, and the supplementary benefits for general government employees and workers with 5.1 million active members and 1.5 million pensioners aged 65 and older. Non-general government sponsored schemes cover about 11.2 million active members and 4.3 million pension benefits. These are mainly occupational pension plans, which comprise both defined benefit and defined contribution schemes and are therefore displayed as part of column C (total). The system displayed in column B is the professional workers pension insurance, with 0.67 million active members and 0.14 million pension entitlements respectively.

**Table 5. 6: Participants in social insurance pension schemes**

End 2006, millions

Item	Recording Sponsor	Core national accounts					Non-core national accounts		Total <sup>6)</sup>
		Non-general government			General government				
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>		
				Defined Benefit Schemes	Defined Benefit Schemes <sup>5)</sup>				
Active members			0.67	11.23			6.94	35.03	53.20
Pensioners			0.14	4.26			2.91	25.22	32.39
Of which: Deferred pensioners <sup>4)</sup>			n.a.	n.a.			n.a.	n.a.	n.a.
Pensioners receiving	spouse pensions		0.03	n.a.			n.a.	5.68	n.a.
	child pensions		0.01	n.a.			n.a.	0.40	n.a.
	disability/invalidity/incapacity pensions		0.01	n.a.			n.a.	1.68	n.a.

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

5) Number of pensioners of the supplementary benefits for general government employees and workers are restricted to the age group 65 and older.

6) The figure Total, due to the institutional setup of pension systems in Germany, can only be interpreted as the aggregated number of pensions, but not number of people, as many participants have simultaneous entitlements from more than one pension plan.

<sup>30</sup> Data on the number of participants in social insurance pension schemes is from 2006 if available, otherwise from previous years.

## 5.6.2. Estimates of pension entitlements in social insurance

In Germany, various accrued-to-date liability estimates of the pension entitlements in social insurance have been carried out. They are based on (i) a *national model* developed by DESTATIS and based on individual pension entitlement data; (ii) the model of the University of Freiburg; and (iii) the model developed by the World Bank (PROST). The underlying assumptions and the results of the estimations are shown in Table 5. Table 5.7.

Assumptions are needed for wage growth, the inflation rate and the discount rate. The wage growth rate is assumed to be 3.7% in the national model (AWG) while calculations under the basic scenario (Table 5. 5.8) are based on a nominal wage trend of around 2.9% and the estimations of the Freiburg model are based on a real GDP growth rate of 1.5%. The remaining assumptions for the various models are essentially consistent with each other. Furthermore, disaggregated pension scheme data are available for the national model with breakdowns by gender, type and individual pension entitlement. The data input for the Freiburg model and for the World Bank model are only disaggregated by gender and type. Finally, the estimations have been carried out by applying the ABO and the PBO valuation method in the case of the national model and the Freiburg model. Estimations based on the World Bank model are only available on the PBO valuation method.

**Table 5. 7 (a): Data input and model assumptions**

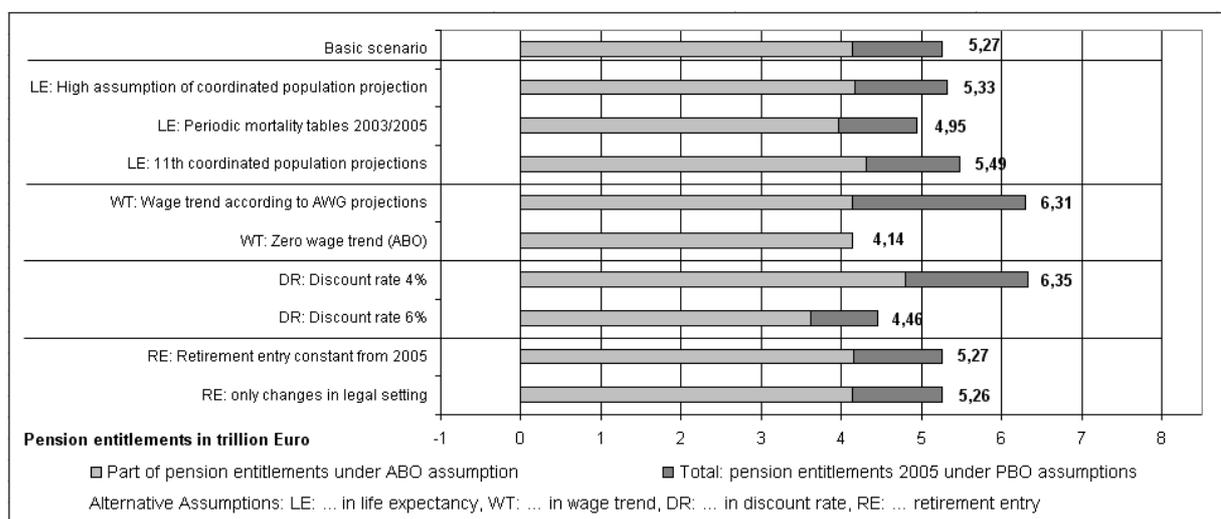
	National model	Freiburg model	World Bank model
	Social security pension scheme	Civil servant scheme	Social security pension scheme
Economic data			
• Real GDP growth		1.5%	1.3 %
• Wage growth	2.9% (nominal), 3.7% (nominal)		1.7% (real)
• Inflation rate		2.0%	2.0%
• Discount rate	5.0% (nominal)	3.0%	3.0%
Pension scheme data			
• Social contributions (EUR billion)	150		
• Pension benefits (EUR billion)	226		
• Beneficiaries (million)	20		
Demographic data projection ('05 values male/female)	Life expectancy in 2050		
• Life expectancy at birth (76 years/82 years)	81 years/ 87 years		
• Life expectancy at retirement (16 years/20 years)	20 years/ 24 years		
• Retirement Age (Male/Female 65 years)	Male/Female 65 years		
Aggregation level of data	Disaggregated by gender, type and individual pension entitlement (disability, old age and widows pensions)	Disaggregated by gender and type	Disaggregated by gender and type
ABO/PBO valuation	ABO and PBO	ABO and PBO	PBO

Calculations under the AWG wage assumption show entitlements of EUR 6,310,000 million (PBO). However, the calculations under the assumptions of the basic scenario utilize the wage projections of

the annual pension insurance report, with a lower assumed wage trend (on average 2.9% nominal). This leads to substantially lower entitlements of EUR 5,270,000 million, see Figure 5.7 (b) below. The calculations are based on the 10<sup>th</sup> coordinated population projection, which represents the set of assumptions on mortality valid at the calculation date, and is in line with the assumptions utilized in the AWG projections. A comparative analysis with the mortality from the 11<sup>th</sup> coordinated population projections shows an increase in entitlements of EUR 220,000 million to the basic scenario.

In addition to the calculations of the basic scenario, that uses the most plausible assumptions on mortality, wage development, discount rate and retirement age, alternative assumption on those parameters are used in the following analysis, one at a time, to show the effect of parameter changes on total entitlements in a sensitivity analysis:

**Figure 5.7 (b): Sensitivity analysis of pension entitlements**



**Table 5.8: Changes compared to basic variant**

	Total entitlements
	Difference [%]
LE: High assumption of coordinated pop. projection	+1.1%
LE: periodic mortality tables	-6.0%
LE: 11 <sup>th</sup> coordinated population projection	+4.2%
WT: acc. to AWG projections	+20%
WT: zero pension indexation (ABO)	-21.5%
DR: discount rate 4%	+20%
DR: discount rate 6%	-15.3%

Sources: Destatis

Table 5.9 provides an overview of the main results of the estimations for Germany. As shown, estimations for both the employer pension scheme and the social security pension scheme are only available based on the Freiburg model. Due to the current lack of resources, the national model and the World Bank model were only used to derive estimations for the social security pension schemes. The main outcome of the models is that the pension entitlements of the social security pension scheme are

between EUR 4,100,000 and EUR 6,700,000 millions depending on the applied model and valuation method (ABO or PBO). As a percentage of GDP the figures are, for social security, between 184% and 290%. As expected the estimates based on the ABO valuation method are lower than the estimates derived from the PBO valuation.

**Table 5.9: Estimation of pension entitlements and corresponding flows**

2006, EUR billions

Relations	Row number	Scheme Column number	Freiburg model (2006)				National model (2005)		World Bank model	
			Non-core national accounts							
			General Government							
			Employee defined benefit schemes		Social security pension schemes					
G				H						
			ABO	PBO	ABO	PBO	ABO	PBO	PBO	
<b>Opening balance sheet</b>										
	1	Pension entitlements	861	1,008	5,192	6,183	4,168	5,669		
<b>Transactions</b>										
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes	127	166	422	473	359	434		
	2.1	Employer actual social contributions	0	0	73	73	69	69		
	2.2	Employer imputed social contributions	82	113						
	2.3	Employee actual social contributions	0	0	84	84	81	81		
	2.4	Employee imputed social contributions/property income	45	53	264	316	208	283		
	3	Other (actuarial) accumulation of pension entitlements in social security pension funds			6	41	-129	-118		
	4	Pension benefits	46	46	233	233	226	226		
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits	81	121	194	281	3	89		
	6	Change in pension entitlements due to transfers of entitlements between schemes	0	0	0	0				
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	0	0	0	0	0	0		
<b>Other flows</b>										
	8	Revaluations <sup>1)</sup>	0	0	0	0	0	-448		
	9	Other changes in the volume of assets <sup>1)</sup>	0	0	0	0	-35	-42		
<b>Closing balance sheet</b>										
1+5+6 +7+8	10.1	Pension entitlements	942	1,129	5,386	6,464	4,136	5,268	6,710	
	10.2	Pension entitlements (in % of GDP)	41	49	232	278	185	235	289	

Source: Destatis, Research Centre for Generational Contracts, Freiburg University.

The difference in results between Destatis and Freiburg is due to differences in assumptions, as well as structural differences in modelling. The higher assumptions on wage growth utilized by Freiburg's research leads to entitlements higher by approximately one trillion Euro, whereas the higher life expectancy at retirement age is due to the different mortality assumptions. The calculations by Destatis would rise by EUR 220,000 million if the 11<sup>th</sup> coordinated population projection was used instead of the 10<sup>th</sup> coordinated population projection, as described above. In comparison with the results presented by Freiburg, entitlements by Destatis would be by about EUR 200,000 million higher if similar assumptions were used. The remaining difference in results can be seen as a structural difference in modelling between the two approaches. Whereas Destatis calculates entitlements based on the actual entitlements of samples of insured, the approach used by Freiburg is based on the structure of current

new pensioners entering retirement recently. Increase in labour force participation, as especially the case for woman during the last 20-30 years, are represented in Destatis results, however not in the estimates presented by Freiburg. Therefore, and due to further differences in modelling (e.g. derived entitlements of current pensioners, modelling of widow/widowers pensions), a detailed comparison of Destatis and Freiburg results is not possible.

Together with the model estimations some sensitivity analyses have been carried out with the Freiburg model (Table 5.10). Scenarios with different discount rates and growth rates show that the impact of relative changes of the discount rate on the size of pension entitlements is generally higher than the impact of relative changes of the growth rate of wages. For the Freiburg model the corresponding elasticities are approximately 0.3 and 0.2 if the PBO valuation is applied. The elasticities are substantially lower in the case of an ABO valuation.

**Table 5.10: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%  
2006, EUR billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	7345	36.4%	<b>-0.39</b>	<b>0.07</b>	8672	34.2%	<b>-0.45</b>	<b>0.31</b>
1.0%	1.5%	7525	39.7%	<b>-0.39</b>	<b>0.10</b>	9681	49.8%	<b>-0.48</b>	<b>0.44</b>
1.0%	2.0%	7722	43.4%	<b>-0.39</b>	<b>0.08</b>	10863	68.1%	<b>-0.51</b>	<b>0.37</b>
2.0%	1.0%	6160	14.4%	<b>-0.51</b>	<b>0.07</b>	7083	9.6%	<b>-0.59</b>	<b>0.28</b>
2.0%	1.5%	6310	17.2%	<b>-0.51</b>	<b>0.10</b>	7819	21.0%	<b>-0.63</b>	<b>0.39</b>
2.0%	2.0%	6473	20.2%	<b>-0.52</b>	<b>0.08</b>	8672	34.2%	<b>-0.67</b>	<b>0.33</b>
3.0%	1.0%	5259	-2.4%	<b>-0.61</b>	<b>0.07</b>	5913	-8.5%	<b>-0.70</b>	<b>0.26</b>
<b>3.0%</b>	<b>1.5%</b>	<b>5386</b>	<b>0.0%</b>	<b>-0.61</b>	<b>0.10</b>	<b>6464</b>	<b>0.0%</b>	<b>-0.74</b>	<b>0.36</b>
3.0%	2.0%	5524	2.6%	<b>-0.62</b>	<b>0.08</b>	7097	9.8%	<b>-0.78</b>	<b>0.29</b>
4.0%	1.0%	4561	-15.3%	<b>-0.40</b>	<b>0.07</b>	5033	-22.1%	<b>-0.45</b>	<b>0.23</b>
4.0%	1.5%	4670	-13.3%	<b>-0.40</b>	<b>0.10</b>	5454	-15.6%	<b>-0.47</b>	<b>0.32</b>
4.0%	2.0%	4787	-11.1%	<b>-0.40</b>	<b>0.08</b>	5933	-8.2%	<b>-0.49</b>	<b>0.26</b>

Source: Research Centre for Generational Contracts, Freiburg University.

As described in the previous paragraphs, the model calculations are based on various assumptions which themselves depend on future projections of parameters that can be estimated with more or less uncertainty. The most influential parameters to mention are wage trend, demographics and discount rate. Medium-term projections on most of these parameters do exist, however a complete economic model would be necessary to allow for consistent parameter choice. A second aspect is the modelling of pension reforms, where the outcome of the reform depends on the behavioural assumption of the new retirees in respect to changes in retirement age, early retirement penalty and legislation, for example in granting disability benefits. Availability of input data is another issue, as some data is either only available with a significant time lag, e.g. data on employees insured, or has to be especially compiled for further analysis. A substantial amount of time is also required to calibrate the model in compliance with the systems' complex technical and legal setup.

## 5.7. Spain

### 5.7.1. Main characteristics of social insurance

In Spain, social insurance is predominantly determined by the social security pension scheme with 19.15 million active members and 4.84 million retirement pensioners at end-2006. There are further 3.39 million recipients of spouse pensions, child pensions and disability pensions. Social insurance sponsored by general government also covers a defined benefit scheme for government employees (civil servants) with around 0.9 million active members and 0.6 millions pensioners.

Non-general government sponsored autonomous private (funded) pension schemes covered more than 1.6 million active members in 2005. For monetary financial institutions, the active members of private schemes number 99,000 and the pensioners 173,000 at end-2006.

**Table 5.11: Participants in social insurance pension schemes**

End 2006, millions

Item	Recording Sponsor	Core national accounts					Non-core national accounts		Total
		Non-general government			General government				
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup> Defined Benefit Schemes		Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>		
				Defined benefit schemes	Defined benefit schemes				
Active members								19.15	
Pensioners								4.84	
Of which: Deferred pensioners <sup>4)</sup>									
Pensioners receiving	spouse pensions							2.22	
	child pensions							0.26	
	disability/invalidity/incapacity pensions							0.88	

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.7.2. Estimates of pension entitlements in social insurance

To provide estimations of pension entitlements incurred by general government and based on the accrued-to-date liabilities for the supplementary table, a working group was set up after the first meetings of the Task Force. This working group comprises the following organisations: (i) Banco de España (Central Bank); (ii) IGAE (Audit Office); (iii) Dirección General de Ordenación de la Seguridad

Social (Ministry of Labour and Social Affairs); (iv) Tesorería General de la Seguridad Social (Social Security Treasury); (v) Subdirección General de Clases Pasivas (Ministry of Finance); and (vi) Instituto Nacional de Estadística (Statistical Office).

In recent months, both the Social Security and the Ministry of Finance have carried out some pilot projects to make estimations for the supplementary table (social security pension schemes and civil servants pension scheme). The outcome of the pilot studies is based on the PBO valuation method and it is shown in the tables below. These estimations have been calculated for years 2005 and 2006. The annual update of the Supplementary Table would be available at the end of the following year.

Estimates based on the Freiburg model have also been undertaken for Spain. For that purpose detailed input data were provided by Spain on the social security pension scheme. The data cover series on the contributors by age and gender, the pension benefits by age, gender and type and the beneficiaries by age, gender and type.

**Table 5.12: Data input and model assumptions**

2006

	National model 2006		Freiburg model 2006
	Social security pension scheme	Civil servants scheme	Social security pension scheme
Economic data			
• GDP growth	1.8% (real)		1.5% (real)
• Wage growth	2.0%	2.0%	2.0%
• Inflation rate	3.0%	3.0%	3.0%
• Discount rate			
Schemes data			
• Social contributions (EUR billion)			
• Pension benefits (EUR billion)			
• Beneficiaries (in million)			
Aggregation level of data			
ABO/PBO valuation	PBO	PBO	ABO and PBO

	Social security pension scheme	EUR billions
Pension scheme data		
• Contributors	By age (annual, 16 to 75) and gender (male, female) By age, gender and type	
• Pension benefits	Old age pensions (annual, 50 to over 100) and gender Disabled pensions (annual, 15 to over 100) and gender Survivor pensions (total, by gender)	48.851 8.932 14.687
• Beneficiaries	By age, gender and type: old age (annual, 50 to over 100) and gender; disabled (annual, 15 to over 100) and gender; survivors (total, by gender)	
• Indexation rule	Adjustment for CPI (projected for next year plus the deviation from projection of the previous year)	
Demographic data	No population data are required as detailed data on contributors have been provided.	

Source: Research Centre for Generational Contracts, Freiburg University.

Results have been provided for 2005 and 2006 by applying the ABO and the PBO valuation method. These results are shown in the following table, together with the results obtained with the national model.

**Table 5.13: Estimation of pension entitlements and corresponding flows**

2006, EUR billions

Relations	Row number	Column number	National model (2006)		Freiburg model (2006)		
			Recording	Non-core national accounts			
			Sponsor	General government			
			Employee DB scheme	Social security pension schemes			
		G	H	H			
			PBO	PBO	ABO	PBO	
<b>Opening balance sheet</b>							
	1	Pension entitlements	207	2,193	1,835	2,173	
<b>Transactions</b>							
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes	22	194	178	195	
	2.1	Employer actual social contributions	0	62	61	61	
	2.2	Employer imputed social contributions	11				
	2.3	Employee actual social contributions	1	22	21	21	
	2.4	Employee imputed social contributions/ property income	10	110	95	113	
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes		11	30	38	
	4	Pension benefits	9	74	74	74	
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits	13	131	135	160	
	6	Change in pension entitlements due to transfers of entitlements between schemes	0	0	0	0	
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	0	0	0	0	
<b>Other flows</b>							
	8	Revaluations <sup>1)</sup>	3	25			
	9	Other changes in the volume of assets <sup>1)</sup>	0	0			
<b>Closing balance sheet</b>							
1+5+6+7+8	10.1	Pension entitlements	223	2,349	1,969	2,333	
	10.2	Pension entitlements (in % of GDP)	23	240	201	238	

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of the key model assumptions, the discount rate and the wage growth rate as indicated in the table.

**Table 5.14: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%  
 2006, EUR billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	2879	46.2%	<b>-0.44</b>	<b>0.00</b>	3390	45.3%	<b>-0.50</b>	<b>0.17</b>
1.0%	1.5%	2879	46.2%	<b>-0.44</b>	<b>0.00</b>	3597	54.1%	<b>-0.51</b>	<b>0.24</b>
1.0%	2.0%	2879	46.2%	<b>-0.44</b>	<b>0.00</b>	3828	64.0%	<b>-0.53</b>	<b>0.19</b>
2.0%	1.0%	2357	19.7%	<b>-0.59</b>	<b>0.00</b>	2717	16.5%	<b>-0.66</b>	<b>0.15</b>
2.0%	1.5%	2357	19.7%	<b>-0.59</b>	<b>0.00</b>	2863	22.7%	<b>-0.68</b>	<b>0.21</b>
2.0%	2.0%	2357	19.7%	<b>-0.59</b>	<b>0.00</b>	3026	29.7%	<b>-0.70</b>	<b>0.17</b>
3.0%	1.0%	1969	0.0%	<b>-0.70</b>	<b>0.00</b>	2228	-4.5%	<b>-0.78</b>	<b>0.14</b>
<b>3.0%</b>	<b>1.5%</b>	<b>1969</b>	<b>0.0%</b>	<b>-0.70</b>	<b>0.00</b>	<b>2333</b>	<b>0.0%</b>	<b>-0.81</b>	<b>0.19</b>
3.0%	2.0%	1969	0.0%	<b>-0.70</b>	<b>0.00</b>	2450	5.0%	<b>-0.83</b>	<b>0.15</b>
4.0%	1.0%	1676	-14.9%	<b>-0.45</b>	<b>0.00</b>	1865	-20.1%	<b>-0.49</b>	<b>0.12</b>
4.0%	1.5%	1676	-14.9%	<b>-0.45</b>	<b>0.00</b>	1942	-16.8%	<b>-0.50</b>	<b>0.17</b>
4.0%	2.0%	1676	-14.9%	<b>-0.45</b>	<b>0.00</b>	2028	-13.1%	<b>-0.52</b>	<b>0.13</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.8. France

### 5.8.1. Main characteristics of social insurance

In France, social insurance pensions are dominated by the social security pension scheme with 22 million active members and 11.9 million pensioners as at end-2005. There are 3.1 recipients of spouse pensions and disability pensions. Social insurance sponsored by general government also covers a defined benefit scheme for government employees (civil servants) with around 2.5 million active members and 1.5 million pensioners which is closely interlinked with the social security pension scheme.

The non-general government sponsored pension schemes covered 1.7 million active members and 0.6 million pensioners in 2004, in addition to their membership in the schemes described above.

**Table 5.15: Participants in social insurance pension schemes**

End 2004 and 2005, EUR millions

Recording Sponsor		Core national accounts						Non-core national accounts		Total
		Non-general government			General government					
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>			Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>			
				Defined Benefit Schemes	Defined Benefit Schemes					
Active members		1.7						2.5	22.0	
Pensioners		0.6						1.5	8.8	
Of which: Deferred pensioners <sup>4)</sup>										
Pensioners receiving	spouse pensions							0.4	0.9	
	child pensions									
	disability/invalidity/incapacity pensions							0.6	2.2	

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.8.2. Estimates of pension entitlements in social insurance

Three approaches were provided to estimate the accrued-to-date liabilities for government schemes: the model provided by the national statistical office (INSEE), the Freiburg-model and results based on the World Bank model (PROST). The underlying assumptions are shown in Table 5.16 and the results in Table 5.17.

**Table 5.16: Data input and model assumptions**

	National model (2006)	National model (2005)	Freiburg model (2006)		World Bank model (2006)
	Civil servant scheme	Social security pension scheme	Civil servants scheme	Social security pension scheme	Social security pension scheme
Economic data					
• GDP growth		1.8% (real)	1.5% (real)		1.5% (real)
• Wage growth	0%				1.5%
• Inflation rate	1.8%	not used	2.0%		2.0%
• Discount rate	2.5%	3.0%	3.0%		3.0%
Schemes data					
• Social contributions (EUR billion)					
• Pension benefits (EUR billion)	35	174	37	178	168
• Beneficiaries (in million)					
Aggregation level of data			Disaggregated in “Regime general” and civil servants		
ABO/PBO valuation	PBO	PBO	ABO and PBO		PBO

**Table 5.17: Estimation of pension entitlements and corresponding flows**  
2005 and 2006, EUR billions

Relations	Row number	Recording	Freiburg Model (2006)				PROST (2006)	National Model (2006)	National Model (2005)
			Non-core national accounts		General Government				
		Sponsor	Employee defined benefit schemes	Social security pension schemes			Employee defined benefit schemes	Social security pension schemes	
		General government							
		Column number	G	H	H	H	H	H	
<b>Opening balance sheet</b>									
			ABO	PBO	ABO	PBO	PBO	PBO	
	1	Pension entitlements	849	1,023	4,212	5,000	5,467	916	
<b>Transactions</b>									
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes	91	107	352	392	148	60	
	2.1	Employer actual social contributions	30	30	75	75		75	
	2.2	Employer imputed social contributions	12	19					
	2.3	Employee actual social contributions	5	5	61	61		61	
	2.4	Employee imputed social contributions/ property income	44	53	216	256	274	na	
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes			40	35		na	
	4	Pension benefits	38	38	179	179	168	35	
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits	53	69	213	248	254		
	6	Change in pension entitlements due to transfers of entitlements between schemes							
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)							

Other flows									
	8	Revaluations <sup>1)</sup>							
	9	Other changes in the volume of assets <sup>1)</sup>							
Closing balance sheet									
1+5+6 +7+8	10.1	Pension entitlements	902	1093	4,225	5,248	5,721	941	5,623
	10.2	Pension entitlements (in % of GDP)	50.3	61.0	247.0	292.9	319.3	52.5	327.3

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of key model assumptions as indicated in Table 5.18.

**Table 5.18: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%

2006, EUR billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	6227	40.7%	<b>-0.39</b>	<b>0.00</b>	7417	41.3%	<b>-0.44</b>	<b>0.13</b>
1.0%	1.5%	6227	40.7%	<b>-0.39</b>	<b>0.00</b>	7752	47.7%	<b>-0.46</b>	<b>0.18</b>
1.0%	2.0%	6227	40.7%	<b>-0.39</b>	<b>0.00</b>	8121	54.7%	<b>-0.47</b>	<b>0.14</b>
2.0%	1.0%	5202	17.5%	<b>-0.43</b>	<b>0.00</b>	6070	15.7%	<b>-0.48</b>	<b>0.11</b>
2.0%	1.5%	5202	17.5%	<b>-0.43</b>	<b>0.00</b>	6311	20.2%	<b>-0.50</b>	<b>0.16</b>
2.0%	2.0%	5202	17.5%	<b>-0.43</b>	<b>0.00</b>	6574	25.3%	<b>-0.51</b>	<b>0.13</b>
2.5%	1.0%	4787	8.2%	<b>-0.49</b>	<b>0.00</b>	5535	5.5%	<b>-0.55</b>	<b>0.11</b>
2.5%	1.5%	4787	8.2%	<b>-0.49</b>	<b>0.00</b>	5740	9.4%	<b>-0.56</b>	<b>0.15</b>
2.5%	2.0%	4787	8.2%	<b>-0.49</b>	<b>0.00</b>	5966	13.7%	<b>-0.58</b>	<b>0.12</b>
3.0%	1.0%	4425	0.0%	<b>-0.63</b>	<b>0.00</b>	5071	-3.4%	<b>-0.42</b>	<b>0.10</b>
<b>3.0%</b>	<b>1.5%</b>	<b>4425</b>	<b>0.0%</b>	<b>-0.63</b>	<b>0.00</b>	<b>5248</b>	<b>0.0%</b>	<b>-0.43</b>	<b>0.14</b>
3.0%	2.0%	4425	0.0%	<b>-0.63</b>	<b>0.00</b>	5441	3.7%	<b>-0.44</b>	<b>0.11</b>
4.0%	1.0%	3825	-13.6%	<b>-0.41</b>	<b>0.00</b>	4315	-17.8%	<b>-0.45</b>	<b>0.41</b>
4.0%	1.5%	3825	-13.6%	<b>-0.41</b>	<b>0.00</b>	4447	-15.3%	<b>-0.46</b>	<b>0.06</b>
4.0%	2.0%	3825	-13.6%	-0.41	<b>0.00</b>	4591	-12.5%	<b>-0.47</b>	<b>0.10</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.9. Italy

### 5.9.1. Main characteristics of social insurance

In Italy, social insurance pensions are dominated by the social security pension schemes. At end 2004 there were 24.66 millions active members and 16.72 millions pensioners of which around 1.8 millions were recipients of spouse pensions and disability pensions. The number of pensioners of employer pension schemes was 0.11 million distributed between public employer pension schemes (45% of the total) and private employer pension schemes (55% of the total). Social insurance sponsored by private pension schemes covers 0.11 million pensions.

**Table 5.19: Participants in social insurance pension schemes**

End 2004, millions

Item	Recording Sponsor	Core national accounts						Non-core national accounts		Total	
		Non-general government			General government						
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>					Social security pension schemes
						Classified in financial corporations	Classified in general government <sup>3)</sup>		Social security pension schemes		
Defined Benefit Schemes	Defined Benefit Schemes										
Active members									24.7		
Pensioners									16.7		
Of which: Deferred pensioners <sup>4)</sup>											
Pensioners receiving	spouse pensions								1.0		
	child pensions										
	disability/invalidity/incapacity pensions								0.9		

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.9.2. Estimates of pension entitlements in social insurance

Estimates of pension entitlements in social insurance are not yet available. In line with the compilation strategy already adopted for many components of the government finance statistics, estimates for the Supplementary Table shall be prepared by the National Statistical Institute, The Ministry of Economy and Finances and the Central Bank. An inter-institution working group shall ensure timely consistency between stocks of entitlements, financial flows and corresponding non-financial entries.

## 5.10. Hungary

### 5.10.1. Main characteristics of social insurance

In Hungary, social insurance is predominantly determined by the social security pension scheme with 4.26 million active members and 3.05 million pensioners at end-2006. There were around 1 million recipients of spouse pensions, child pensions and disability pensions. There are no separate pension schemes established for civil servants. Some kinds of pensions are paid directly by the central government but these pensions are similar to the pensions paid by the Pension Insurance Fund or the Health Insurance Fund.

The pension system in Hungary includes the security pension system and the defined contribution, non-governmental pension schemes. The liabilities of the defined contribution pension schemes (the pension entitlements of the members) are available. The non-general government sponsored pension schemes cover voluntary and mandatory private pension schemes classified as financial corporations. Many people are members in both types of pension schemes at the same time. While 1.36 million active members are in voluntary schemes, 2.65 million active members are in mandatory schemes.

**Table 5.20: Participants in social insurance pension schemes**

End 2006, millions

Item	Recording Sponsor	Core national accounts					Non-core national accounts		Total
		Non-general government			General government				
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>		
				Defined Benefit Schemes	Defined Benefit Schemes				
Active members		4.0						4.3	
Pensioners								3.1	
Of which: Deferred pensioners <sup>4)</sup>								0	
Pensioners receiving	spouse pensions							0.2	
	child pensions							0.1	
	disability/invalidity/incapacity pensions							0.7	

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.10.2. Estimates of pension entitlements in social insurance

So far no national estimates of the pension entitlements accumulated by the social security pension scheme have been carried out so far. However, some benchmark calculations have been undertaken with the model developed by the Freiburg University. These calculations are based on harmonised

model assumptions and on input data supplied by the Task Force member (Table 5.21). The model, first, projects the population and the average payments of existing and new retirees. Second, both ABO and PBO approaches can be taken into consideration to estimate the accrued-to-date-liabilities.

**Table 5.21: Data input and model assumptions**

2006		Pension Insurance Fund (PIF)	Central Government
<b>Economic data</b>			
• GDP growth		4.0% (nominal), 1.5% (real)	
• Wage growth			
• Inflation rate		2.0%	
• Discount rate		3.0%	
<b>Schemes data</b>			
• Social contributions (bn. HUF)		1,513.1	4,234.8
• Pension benefits (bn. HUF)		64,440.1	
○ By gender			
○ By type			
• Beneficiaries (in million)		2.74	
○ Beneficiaries (old age)		1.66	
○ Male / Female		0.63/1.03	
○ Beneficiaries (disabled)		0.81	
○ Male / Female		0.41/0.40	
○ Beneficiaries (survivors)		0.28	
○ Male / Female		0.06/0.22	
Aggregation level of data		Disaggregated in Pension Insurance Scheme and central government	
ABO/PBO valuation		ABO and PBO	

Source: Research Centre for Generational Contracts, Freiburg University.

Table 5.22 provides such test results for the year 2006. They have been carried out by using both valuation methods, the ABO and the PBO.

**Table 5.22: Estimation of pension entitlements and corresponding flows**

2006, HUF billions

Relations	Row number	Recording		Non-core national accounts	
		Sponsor			
		General government		Social security pension schemes	
		Column number		H	
				ABO	PBO
<b>Opening balance sheet</b>					
	1	Pension entitlements		51,886	62,979
<b>Transactions</b>					
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes		4,167	4,718
	2.1	Employer actual social contributions		1,186	1,186
	2.2	Employer imputed social contributions			
	2.3	Employee actual social contributions		327	327
	2.4	Employee imputed social contributions/ property income		2,654	3,205
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes		2,906	3,292
	4	Pension benefits		2,315	2,315
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits		4,758	5,696
	6	Change in pension entitlements due to transfers of entitlements between schemes		0	0
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)		0	0
<b>Other flows</b>					
	8	Revaluations <sup>1)</sup>		-2,373	-3,455
	9	Other changes in the volume of assets <sup>1)</sup>		0	0

Closing balance sheet				
1+5+6+7+ 8	10.1	Pension entitlements	54,272	65,220
	10.2	Pension entitlements (in % of GDP)	228	275

Source: Research Centre for Generational Contracts, Freiburg University.

The model assumes that the ratio of the entitled to the pension will be constant and similarly high to the present ratio in the future. This assumption is wrong in the case of Hungary because of the low employment the ratio will decrease significantly in the future. The model also assumes that the level of the new pension will be constant in real terms in the future. Because of the presumably shortening service time and other reasons, it is likely that the level of the new pensions will decrease in the future compared to the present level. Consideration of these factors can somewhat decrease the pension entitlements of the social security pension schemes. Nevertheless the estimates seem acceptable despite of the reservations.

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of key model assumptions as indicated in Table 5.23.

**Table 5.23: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%

2006, HUF billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	74539	37.3%	<b>-0.38</b>	<b>0.04</b>	89716	37.6%	<b>-0.44</b>	<b>0.22</b>
1.0%	1.5%	75545	39.2%	<b>-0.38</b>	<b>0.05</b>	96811	48.4%	<b>-0.47</b>	<b>0.31</b>
1.0%	2.0%	76591	41.1%	<b>-0.38</b>	<b>0.04</b>	104809	60.7%	<b>-0.49</b>	<b>0.25</b>
2.0%	1.0%	62609	15.4%	<b>-0.51</b>	<b>0.04</b>	73415	12.6%	<b>-0.59</b>	<b>0.20</b>
2.0%	1.5%	63442	16.9%	<b>-0.51</b>	<b>0.05</b>	78530	20.4%	<b>-0.61</b>	<b>0.27</b>
2.0%	2.0%	64306	18.5%	<b>-0.51</b>	<b>0.04</b>	84245	29.2%	<b>-0.64</b>	<b>0.22</b>
3.0%	1.0%	53572	-1.3%	<b>-0.60</b>	<b>0.04</b>	61435	-5.8%	<b>-0.33</b>	<b>0.17</b>
<b>3.0%</b>	<b>1.5%</b>	<b>54272</b>	<b>0.0%</b>	<b>-0.60</b>	<b>0.05</b>	<b>65220</b>	<b>0.0%</b>	<b>-0.34</b>	<b>0.24</b>
3.0%	2.0%	54997	1.3%	<b>-0.60</b>	<b>0.04</b>	69423	6.4%	<b>-0.35</b>	<b>0.19</b>
4.0%	1.0%	46582	-14.2%	<b>-0.39</b>	<b>0.04</b>	52426	-19.6%	<b>-0.44</b>	<b>0.49</b>
4.0%	1.5%	47177	-13.1%	<b>-0.39</b>	<b>0.05</b>	55292	-15.2%	<b>-0.46</b>	<b>0.11</b>
4.0%	2.0%	47791	-11.9%	<b>-0.39</b>	<b>0.04</b>	58449	-10.4%	<b>-0.47</b>	<b>0.17</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.11. Netherlands

### 5.11.1. Main characteristics of social insurance

In the Netherlands, the main social insurance pension scheme is a social security pension scheme with 11 million active members and 2.6 million pensioners at end-2005. There is also a government sponsored defined benefit scheme with 0.07 million active members and 0.02 million pensioners. This scheme covers military personnel between the ages of 55 and 65<sup>31</sup>. Schemes sponsored by non-general government units cover 5.2 million active members and 1.6 million pensioners.

**Table 5.24: Participants in social insurance pension schemes**

End 2006, millions

Item	Recording Sponsor	Core national accounts					Non-core national accounts		Total
		Non-general government			General government				
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>		
				Defined Benefit Schemes	Defined Benefit Schemes				
Active members			5.2			0.07		11.0	
Pensioners			1.6			0.02		2.6	
Of which: Deferred pensioners <sup>4)</sup>			6.7						
Pensioners receiving	spouse pensions		0.7						
	child pensions		0.0			.01			
	disability/invalidity/incapacity pensions		0.2			.002			

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.11.2. Estimates of pension entitlements in social insurance

National estimates have been carried out and are shown in Table 5.25 below.

Some benchmark calculations have been undertaken with the model developed by the Freiburg University. These calculations are based on harmonised model assumptions and on input data supplied by the Task Force member (Table 5.25). The model, first, projects the population and the average payments of existing and new retirees. Second, both ABO and PBO approaches can be taken into consideration to estimate the accrued-to-date-liabilities.

<sup>31</sup> For now, this scheme is placed in the core table, as a final decision by the Dutch statistical authorities is pending, based on further discussions on the criteria for core/non core.

**Table 5.25: National estimates for year 2005**

Relations	Row No.	Recording		Core national accounts					Non-core national		Total pension schemes	Counterparts: <sup>4)</sup> Of which: Non-resident households	
		Sponsor		Non-general government			General government						
		Column number	A	B	C	D	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes	H			
							Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes					Classified in financial corporations
						F	G		I	J			
<b>Opening balance sheet</b>													
	1	Pension entitlements		339123			159241						
<b>Changes in pension entitlements due to transactions</b>													
Σ 2.1 to 2.4	2	Increase in pension entitlements due to social contributions											
	2.1	Employer actual social contributions		18163			5481			0			
	2.2	Employer imputed social contributions		507				824					
	2.3	Household actual social contributions		8147			3016			17944			
	2.4	Household social contribution supplements <sup>5)</sup>											
	3	Other (actuarial) increase of pension entitlements in social security pension schemes											
	4	Reduction in pension entitlements due to payment of pension benefits		19792			7319	824		23369			
2 + 3 - 4	5	Changes in pension entitlements due to social contributions and pension benefits											
	6	Transfers of entitlements between schemes											
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)											
<b>Changes in pension entitlements due to other economic flows</b>													
	8	Changes in entitlements due to revaluations <sup>6)</sup>											
	9	Changes in entitlements due to other changes in volume <sup>6)</sup>											
<b>Closing balance sheet</b>													
1+ Σ 5 to 9	10	Pension entitlements											
<b>Related indicators</b>													
	11	Output											
	12	Assets held at the end of the period to meet pensions <sup>7)</sup>											

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element (see paragraph 17.XX).

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are 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) These supplements represent the return on members' claims on pension schemes, both through investment income on defined contribution schemes' assets and for defined benefit schemes through the unwinding of the discount factor applied.

6) A more detailed split of these positions should be provided for columns G and H based on the model calculations carried out for these schemes (see explanatory note).

7) This row includes financial and non-financial assets held for the sole purpose of paying future pensions, excluding claims by the pension scheme on its sponsor; an explanation should be provided of which assets have been included. The cells shown as ■ are not applicable; the cells in ■ will contain different data from the core accounts.

**Table 5.26: Data input and model assumptions**

	Social Security Scheme	Military Scheme
<b>Economic data</b>		
• GDP growth	1.8% (real)	
• Wage growth		
• Inflation rate	2.0%	
• Discount rate	3.0%	
<b>Schemes data</b>		
• Social contributions (EUR billion)		0.65
• Pension benefits (EUR billion)		
o old age	24.3	0.55
o disabled	24.2	0.06
o survivors		0.04
• Beneficiaries (in million)		
o old age		0.02
o male / female		0.018/0.002
o disabled	2.55	0.004
o male / female	1.10 / 1.45	0.003/0.001
o survivors		0.002
o male / female		0.002/0.000
Demographic data projection		
Aggregation level of data	Disaggregated in Algemene Ouderdomswet and Military Scheme	
ABO/PBO valuation	ABO and PBO	ABO and PBO

Table 5.27 provides such test results for the year 2006. They have been carried out by using both valuation methods, the ABO and the PBO.

**Table 5.27: Estimation of pension entitlements and corresponding flows**

2006, EUR billions

Relations	Row number	Recording	Non-core national accounts			
		Sponsor	General Government			
		General government	General government employee defined benefit schemes		Social security pension schemes	
		Column number	G		H	
<b>Opening balance sheet</b>						
	1	Pension entitlements	ABO	PBO	ABO	PBO
			25	30	676	858
<b>Transactions</b>						
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes	-4	-5	58	68
	2.1	Employer actual social contributions	0	0	0	0
	2.2	Employer imputed social contributions	-6	-7		
	2.3	Employee actual social contributions	0	0	24	24
	2.4	Employee imputed social contributions/ property income	1	1	34	43
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes			-20	-29
	4	Pension benefits	1	1	24	24
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits	-5	-6	14	14
	6	Change in pension entitlements due to transfers of entitlements between schemes	0	0	0	0
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	0	0	0	0
<b>Other flows</b>						
	8	Revaluations <sup>1)</sup>	0	0	0	0
	9	Other changes in the volume of assets <sup>1)</sup>	0	0	0	0
<b>Closing balance sheet</b>						
1+5+6	10.1	Pension entitlements	20	24	690	872

+7+8						
	10.2	Pension entitlements (in % of GDP)	4	5	129	163

Source: Research Centre for Generational Contracts, Freiburg University.

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of key model assumptions as indicated in Table 5.28.

**Table 5.28: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%

2006, EUR billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	985	42.8%	<b>-0.43</b>	<b>0.04</b>	1196	37.1%	<b>-0.48</b>	<b>0.33</b>
1.0%	1.5%	998	44.7%	<b>-0.43</b>	<b>0.06</b>	1345	54.2%	<b>-0.51</b>	<b>0.46</b>
1.0%	2.0%	1012	46.8%	<b>-0.43</b>	<b>0.04</b>	1520	74.2%	<b>-0.54</b>	<b>0.39</b>
2.0%	1.0%	810	17.5%	<b>-0.58</b>	<b>0.04</b>	963	10.4%	<b>-0.65</b>	<b>0.30</b>
2.0%	1.5%	822	19.1%	<b>-0.57</b>	<b>0.06</b>	1071	22.8%	<b>-0.68</b>	<b>0.42</b>
2.0%	2.0%	834	20.9%	<b>-0.57</b>	<b>0.04</b>	1196	37.1%	<b>-0.72</b>	<b>0.35</b>
3.0%	1.0%	680	-1.5%	<b>-0.69</b>	<b>0.04</b>	792	-9.2%	<b>-0.77</b>	<b>0.28</b>
<b>3.0%</b>	<b>1.5%</b>	<b>690</b>	<b>0.0%</b>	<b>-0.68</b>	<b>0.06</b>	<b>872</b>	<b>0.0%</b>	<b>-0.81</b>	<b>0.38</b>
3.0%	2.0%	701	1.6%	<b>-0.68</b>	<b>0.05</b>	965	10.6%	<b>-0.85</b>	<b>0.32</b>
4.0%	1.0%	580	-15.9%	<b>-0.44</b>	<b>0.05</b>	665	-23.8%	<b>-0.48</b>	<b>0.25</b>
4.0%	1.5%	589	-14.6%	<b>-0.44</b>	<b>0.06</b>	725	-16.8%	<b>-0.51</b>	<b>0.35</b>
4.0%	2.0%	599	-13.2%	<b>-0.44</b>	<b>0.03</b>	795	-8.9%	<b>-0.53</b>	<b>0.20</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.12. Poland

### 5.12.1. Main characteristics of social insurance

In Poland, social insurance covers the social security pension schemes with 15 million active members and 7.3 million pensioners at end-2006 and the employer pension scheme with 0.5 million active members and 0.2 million pensioners. The social security funds consist of Social Insurance Fund - FUS, compulsory for the large part of the society and Disability and Pension Fund - FER (for farmers). The pension reform introduced in 1999 changed the old PAYG scheme into system of two funds – notional defined contribution scheme (FUS) and compulsory funded defined contribution scheme (OFE), but the latter funded part of the system only for persons born after 1949. The employer pension scheme is organised in the form of non-contributory defined benefit scheme only for the small group of persons, mainly uniformed services. The nature of the contract and the legal framework close to social security pension schemes are seen as the most important criteria to classify the pension entitlements of government employer defined benefit scheme in the non-core accounts...

**Table 5.29: Participants in social insurance pension schemes**

End 2006, millions

Recording  Sponsor  Item		Core national accounts						Non-core national accounts		Total	
		Non-general government			General government						
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>					Social security pension schemes
						Classified in financial corporations	Classified in general government <sup>3)</sup>				
Defined Benefit Schemes	Defined Benefit Schemes										
Active members		13.5						0.2	15.0		
Pensioners								0.2	7.5		
Of which: Deferred pensioners <sup>4)</sup>											
Pensioners receiving	spouse pensions								1.4		
	childChild pensions								0		
	disability/invalidity/incapacity pensions								1.8		

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.12.2. Estimates of pension entitlements in social insurance

So far no national estimates of the pension entitlements accumulated by the social security pension scheme have been carried out. However, some benchmark calculations have been undertaken with the World Bank model PROST developed by the Freiburg University. These calculations are based on harmonised model assumptions and on input data supplied by the Task Force member (Table 5.30). The model, first, projects the population and the average payments of existing and new retirees. Second, both ABO and PBO approaches can be taken into consideration to estimate the accrued-to-date-liabilities.

**Table 5.30: Data input and model assumptions of the Freiburg model**

2006

	Social insurance scheme	Disability and pension scheme	Social insurance scheme for uniformed services	Social insurance scheme for military services
Economic data	-----			
GDP growth	1.5% (real)			
Wage growth	-----			
Inflation rate	2.0%			
Discount rate	3.0%			
Pension scheme data	-----	-----	-----	-----
Social contributions	70.96	1.21		
Pension benefits (bn. PLN)	-----	-----	-----	-----
old age		13.77	0.32	2.58
disabled		2.26	0.38	0.6
survivors		0.4	0.84	1.33
Beneficiaries (in million)	-----	-----	-----	-----
old age				
male / female	4.00	1.2	0.13	0.1
disabled	1.6 / 2.4	0.3 / 0.9	0.115 / 0.014	0.1 / 0.0
male / female	1.9	0.2	0.017	0.02
survivors	1.1 / 0.8	0.1 / 0.1	0.014 / 0.003	0.02 / 0.0
male / female	1.2	0.04	0.039	0.033
	0.2 / 1.0			0.001 / 0.032
Aggregation level of data	Disaggregated into social insurance scheme, disability and pension scheme and social insurance scheme for (non-) military services			
ABO versus PBO valuation	ABO and PBO			

Source: Research Centre for Generational Contracts, Freiburg University.

Table 5.31 provides such test results for the year 2006. They have been carried out by using both valuation methods, the ABO and the PBO.

**Table 5.31: Estimation of pension entitlements and corresponding flows**

2006, PLN billions

Relations	Row number	Recording Sponsor	Freiburg Model (2006)			
			Non-core national accounts			
			General Government			
			General government		Social security pension schemes	
Column number		G		H (PBO)		
		ABO	PBO	ABO	PBO	
<b>Opening balance sheet</b>						
	1	Pension entitlements	237	277	2480	2800
<b>Transactions</b>						
Σ 2.1 to 2.5	2	Social contributions relating to pension schemes	33	36	202	218
	2.1	Employer actual social contributions	0	0	30	30
	2.2	Employer imputed social contributions	20	21		
	2.3	Employee actual social contributions	0	0	42	42
	2.4	Employee imputed social contributions/ property income	12	15	129	146
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes			130	135
	4	Pension benefits	10	10	117	117
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits	23	26	215	236
	6	Change in pension entitlements due to transfers of entitlements between schemes	0	0	0	0
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	0	0	0	0
<b>Other flows</b>						
	8	Revaluations <sup>1)</sup>	0	0	0	0
	9	Other changes in the volume of assets <sup>1)</sup>	0	0	0	0
<b>Closing balance sheet</b>						
1+5+6 +7+8	10.1	Pension entitlements	260	303	2695	3037
	10.2	Pension entitlements (in % of GDP)	25	29	255	287

Source: Research Centre for Generational Contracts, Freiburg University

**Table 5.32: Data input and model assumptions for the World Bank model**

	Social Insurance Scheme	Disability and Pension Scheme	Social Insurance Scheme for Uniformed Services	Social Insurance Scheme for Military Services
Economic data (assumptions)				
GDP growth	1.5% (real)*			
Wage growth				
Inflation rate	2.0%*			
Discount rate	3.0%			
Schemes data				
Social contributions	75.96**	1.11		
Pension benefits (bn. PLN)	109.404**			
old age	67.77**	14.92		
disabled	39.731**			
survivors	8.0**	0.4		
Beneficiaries (in million)				
old age	4.3**	1.2		
male / female	1.7 / 2.6**	0.3 / 0.9		
disabled				

male / female survivors male / female	2.3** 1.3 / 1.1** 1.4** 0.2 / 1.2**	0.2 0.1 / 0.1 0.05		
Aggregation level of data	Disaggregated in Social Insurance Scheme, Disability and Pension Scheme (for farmers)			
ABO versus PBO valuation	PBO			

\*) These are the assumptions for 2008 and the following years. Due to the reform of the Polish Social Insurance Scheme implemented in 1999, the base year for the PROST simulation for Poland is 1998 (in practical terms, in PROST, it is not possible to model a pension system in which a reform is already underway). Therefore, in order to achieve reasonable results for the period 1998-2006, the assumptions input into the model are consistent with the actual figures for these years. This also applies to inflation and real GDP growth rates. For year 2007, there were the most actual forecasts of inflation and GDP growth assumed.

\*\*\*) The PROST forecasts for 2006, as the base year for Poland (for the Social Insurance Scheme projection) is 1998 – the year preceding the reform of the Polish pension system).

**Table 5.33: Estimation of pension entitlements and corresponding flows (PROST)**

Relations	Row number	Recording Sponsor General government Column number	PROST Model (2006)			
			Non-core national accounts			
			General Government			
			General government employee defined benefit schemes G		Social security pension schemes H (PBO)	
		ABO	PBO	FUS*	FER**	
<b>Opening balance sheet</b>						
	1	Pension entitlements			2 532	-
<b>Transactions</b>						
Σ 2.1 to 2.5	2	Social contributions relating to pension schemes			76	1
	2.1	Employer actual social contributions				
	2.2	Employer imputed social contributions				
	2.3	Employee actual social contributions				
	2.4	Employee imputed social contributions/ property income				
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes				
	4	Pension benefits			109	15
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits				
	6	Change in pension entitlements due to transfers of entitlements between schemes	0	0	0	0
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	0	0	0	0
<b>Other flows</b>						
	8	Revaluations <sup>1)</sup>				
	9	Other changes in the volume of assets <sup>1)</sup>				
<b>Closing balance sheet</b>						
1+5+6 +7+8	10.1	Pension entitlements			2,579	465
	10.2	Pension entitlements (in % of GDP)			243	44

\* FUS: Social Insurance Fund

\*\* FER: Disability and pension Fund (farmers)

In the table above, Social Insurance Fund (FUS) and Disability and Pension Fund (farmers) are presented in the social security column. The pension system for military and uniformed services is missing (to be calculated in future). Overall liabilities of social security funds under PBO amounted to PLN 3043,9 billions or 287.1% of GDP.

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of key model assumptions as indicated in the

table. The comparability between results obtained in Freiburg model and the World Bank model is an issue of concern, since the technical description of the Freiburg model was unavailable.

**Table 5.34: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%

2006, PLN billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	3646	35.3%	<b>-0.35</b>	<b>0.02</b>	4091	34.7%	<b>-0.38</b>	<b>0.13</b>
1.0%	1.5%	3669	36.2%	<b>-0.35</b>	<b>0.03</b>	4275	40.8%	<b>-0.39</b>	<b>0.18</b>
1.0%	2.0%	3693	37.0%	<b>-0.35</b>	<b>0.02</b>	4475	47.4%	<b>-0.40</b>	<b>0.14</b>
2.0%	1.0%	3102	15.1%	<b>-0.47</b>	<b>0.02</b>	3434	13.1%	<b>-0.51</b>	<b>0.12</b>
2.0%	1.5%	3121	15.8%	<b>-0.48</b>	<b>0.02</b>	3572	17.6%	<b>-0.53</b>	<b>0.16</b>
2.0%	2.0%	3140	16.5%	<b>-0.48</b>	<b>0.02</b>	3721	22.5%	<b>-0.54</b>	<b>0.13</b>
3.0%	1.0%	2679	-0.6%	<b>-0.57</b>	<b>0.02</b>	2931	-3.5%	<b>-0.62</b>	<b>0.10</b>
<b>3.0%</b>	<b>1.5%</b>	<b>2695</b>	<b>0.0%</b>	<b>-0.57</b>	<b>0.02</b>	<b>3037</b>	<b>0.0%</b>	<b>-0.63</b>	<b>0.14</b>
3.0%	2.0%	2711	0.6%	<b>-0.57</b>	<b>0.02</b>	3150	3.7%	<b>-0.65</b>	<b>0.11</b>
4.0%	1.0%	2344	-13.0%	<b>-0.38</b>	<b>0.02</b>	2539	-16.4%	<b>-0.40</b>	<b>0.09</b>
4.0%	1.5%	2357	-12.5%	<b>-0.38</b>	<b>0.02</b>	2621	-13.7%	<b>-0.41</b>	<b>0.13</b>
4.0%	2.0%	2370	-12.0%	<b>-0.38</b>	<b>0.01</b>	2709	-10.8%	<b>-0.42</b>	<b>0.07</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.13. Sweden

### 5.13.1. Main characteristics of social insurance

Social insurance pension schemes in Sweden is based on an earnings related pay-as-you-go system with 2 million active members in the employer pension schemes and 2 million active members in social security pension schemes in 2006. Social insurance is predominantly sponsored by the general government with active members of 3.2 million. The non-general government sponsored schemes cover 1 million active members.

**Table 5.35: Participants in social insurance pension schemes**

End 2006, millions

Item	Recording Sponsor	Core national accounts						Non-core national accounts		Total
		Non-general government			General government					
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>			Social security pension schemes	
						Classified in financial corporations	Classified in general government <sup>3)</sup>			
Defined Benefit Schemes	Defined Benefit Schemes									
Active members			2		1.3		1.3	3.2		
Pensioners										
Of which: Deferred pensioners <sup>4)</sup>										
Pensioners receiving	spouse pensions									
	child pensions									
	disability/invalidity/incapacity pensions									

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

### 5.13.2. Estimates of pension entitlements in social insurance

Estimates on the social security scheme (*inkomstpension*) are calculated on an ABO basis. National estimates are shown in Table 5.36. Pension entitlements and retirements are adjusted downwards by using an "annuitisation divisor" which is calculated from unisex life expectancy at retirement age and a real interest rate of 1.6%.

In addition, some benchmark calculations have been undertaken with the model developed by the Freiburg University. These calculations are based on harmonised model assumptions and on input data supplied by the Task Force member (Table 5.37). The model, first, projects the population and the

average payments of existing and new retirees. Second, both ABO and PBO approaches can be taken into consideration to estimate the accrued-to-date liabilities.

**Table 5.36: National estimates**  
SEK billions

Relations	Row number							
		Recording		Non-core national accounts				
		Sponsor		General Government				
		General government		Social security pension schemes				
		Column number		H				
<b>Opening balance sheet</b>								
			<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	
	1	Pension entitlements		5729	5984	6244	6461	
<b>Transactions</b>								
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes						
	2.1	Employer actual social contributions						
	2.2	Employer imputed social contributions						
	2.3	Employee actual social contributions						
	2.4	Employee imputed social contributions/ property income						
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes						
	4	Pension benefits						
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits						
	6	Change in pension entitlements due to transfers of entitlements between schemes						
	7	Revaluations <sup>1)</sup>						
	8	Other changes in the volume of assets <sup>1)</sup>						
1+5 to 8	9	Pension entitlements	5729	5984	6244	6461	6703	
		Pension entitlements (in % of GDP)	242	243	243	242	236	
<b>Related indicators</b>								
		Assets held at the end of the period to meet pensions:						
		Buffer fund	488	577	646	769	858	
		Contribution assets	5301	5465	5607	5721	5945	
		Total Assets <sup>32</sup>	5789	6042	6253	6490	6803	

**Table 5.37: Data input and model assumptions**  
2006

	Social Security Scheme
Economic data	
• GDP growth	1.5%
• Wage growth	
• Inflation rate	2.0%
• Discount rate	1.6%
Schemes data	
• Social contributions (SEK billion)	212.34
• Pension benefits (SEK billion)	199.3
o old age	107.4
o male / female	91.9
• Beneficiaries (in million)	1.72
o old age	
o male / female	0.76 / 0.95
Demographic data projection	
	Freiburg model
	Social security scheme
Aggregation level of data	
ABO/PBO valuation	ABO and PBO

Table 5.38 provides such test results for the year 2006. They have been carried out by using both valuation methods, the ABO and the PBO.

<sup>32</sup> Total asset is the sum of Buffer funds and Contribution assets.

**Table 5.38: Estimation of pension entitlements and corresponding flows**  
2006, SEK billions

Relations	Row number	Column number	Freiburg Model	
			Non-core national accounts	
			General Government	
			Social security pension schemes	
H				
Opening balance sheet				
			ABO	PBO
	1	Pension entitlements	4,650	5,511
Transactions				
Σ 2.1 to 2.4	2	Social contributions relating to pension schemes	422	465
	2.1	Employer actual social contributions	109	109
	2.2	Employer imputed social contributions		
	2.3	Employee actual social contributions	77	77
	2.4	Employee imputed social contributions/ property income	235	278
	3	Other (actuarial) accumulation of pension entitlements in social security pension schemes	-135	-180
	4	Pension benefits	176	176
2 + 3 - 4	5	Change in pension entitlements due to social contributions and pension benefits	110	109
	6	Change in pension entitlements due to transfers of entitlements between schemes	0	0
	7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	0	0
Other flows				
	8	Revaluations <sup>1)</sup>	0	0
	9	Other changes in the volume of assets <sup>1)</sup>	0	0
Closing balance sheet				
1+5+6+7 +8	10.1	Pension entitlements	4,760	5,620
	10.2	Pension entitlements (in % of GDP)	168	198

Source: Research Centre for Generational Contracts, Freiburg University.

Sensitivity analyses have been carried out based on the Freiburg model for the year 2006 and the impact has been measured on pension obligations due to changes of key model assumptions as indicated in Table 5.39.

**Table 5.39: Sensitivity analyses by varying the discount rate and the wage growth rate**

Standard scenario: discount rate: 3%; and wage growth rate: 1.5%

2006, SEK billions (ABO and PBO)

Parameters		ABO	Difference to standard scenario	Elasticity		PBO	Difference to standard scenario	Elasticity	
Discount Rate	Growth Rate			Discount Rate	Growth Rate			Discount Rate	Growth Rate
1.0%	1.0%	6702	40.8%	<b>-0.39</b>	<b>0.00</b>	7968	41.8%	<b>-0.46</b>	<b>0.18</b>
1.0%	1.5%	6702	40.8%	<b>-0.39</b>	<b>0.00</b>	8462	50.6%	<b>-0.48</b>	<b>0.25</b>
1.0%	2.0%	6702	40.8%	<b>-0.39</b>	<b>0.00</b>	9017	60.5%	<b>-0.50</b>	<b>0.20</b>
2.0%	1.0%	5599	17.6%	<b>-0.53</b>	<b>0.00</b>	6468	15.1%	<b>-0.62</b>	<b>0.15</b>
2.0%	1.5%	5599	17.6%	<b>-0.53</b>	<b>0.00</b>	6817	21.3%	<b>-0.64</b>	<b>0.22</b>
2.0%	2.0%	5599	17.6%	<b>-0.53</b>	<b>0.00</b>	7207	28.2%	<b>-0.66</b>	<b>0.17</b>
3.0%	1.0%	4760	0.0%	<b>-0.63</b>	<b>0.00</b>	5367	-4.5%	<b>-0.73</b>	<b>0.13</b>
<b>3.0%</b>	<b>1.5%</b>	<b>4760</b>	<b>0.0%</b>	<b>-0.63</b>	<b>0.00</b>	<b>5620</b>	<b>0.0%</b>	<b>-0.76</b>	<b>0.19</b>
3.0%	2.0%	4760	0.0%	<b>-0.63</b>	<b>0.00</b>	5900	5.0%	<b>-0.78</b>	<b>0.15</b>
4.0%	1.0%	4108	-13.7%	<b>-0.41</b>	<b>0.00</b>	4541	-19.2%	<b>-0.46</b>	<b>0.12</b>
4.0%	1.5%	4108	-13.7%	<b>-0.41</b>	<b>0.00</b>	4727	-15.9%	<b>-0.48</b>	<b>0.17</b>
4.0%	2.0%	4108	-13.7%	<b>-0.41</b>	<b>0.00</b>	4933	-12.2%	<b>-0.49</b>	<b>0.09</b>

Source: Research Centre for Generational Contracts, Freiburg University.

## 5.14. United Kingdom

### 5.14.1. Main characteristics of social insurance

In the UK, social insurance pension schemes are mainly based on employer (occupational) schemes in both the private and public sector. In 2006 there were an estimated 9.6 million members in occupational pension schemes, with 4.4 million in private sector schemes and 5.2 million in public sector schemes. The state pension scheme provides a basic level of pension and is open to all citizens satisfying minimum contribution criteria.

**Table 5.40: Participants in social insurance pension schemes**

End 2006, millions

Item	Recording Sponsor	Core national accounts					Non-core national accounts		Total	
		Non-general government			General government					
		Defined contribution schemes	Defined benefit schemes and other <sup>1)</sup> non-defined contribution schemes	Total	Defined contribution schemes	Defined benefit schemes for general government employees <sup>2)</sup>		Social security pension schemes		
						Classified in financial corporations	Classified in general government <sup>3)</sup>			
				Defined Benefit Schemes	Defined Benefit Schemes					
Active members		1.1	3.4	4.5	-	-	1.8	3.3	33.2	42.8
Pensioners		1.3	10.9	12.1	-	-	2.0	3.9	12.0	30.0
Of which: Deferred pensioners <sup>4)</sup>		1.2	5.8	7.0	-	-	1.0	1.5	-	9.5
Pensioners receiving	spouse pensions	N/A	N/A	N/A	-	-	N/A	N/A	4.7	N/A
	child pensions	N/A	N/A	N/A	-	-	N/A	N/A	0.01	N/A
	disability/invalidity/incapacity pensions	N/A	N/A	N/A	-	-	N/A	N/A	N/A	N/A

1) Such other non-defined contribution schemes, often described as hybrid schemes, have both a defined benefit and a defined contribution element.

2) Schemes organised by general government for its current and former employees.

3) These are non-autonomous defined benefit schemes whose pension entitlements are recorded in the core accounts.

4) Defined as participants below retiring age who have frozen their pension entitlements in the scheme of a former employer.

5) Social security scheme information from 2003

### 5.14.2. Estimates of pension entitlements in social insurance

National estimates are available through government finance accounts. In view of the availability of national estimates based on actuarial methods, no model results were calculated by statisticians.

With regard to the actuarial assumptions, in summary, the PBO actuarial method is used, and a real discount rate of 1.8% corresponding to the AA corporate bond rate as set out in the International Accounting Standard 19. This, together with an assumed rate of inflation of 2.75% as at 31 March 2007, gives a nominal discount rate of 4.6% a year.

**Table 5.41 Estimates of pension entitlements and corresponding flows**

2004-05, UKL millions

	<i>Recording</i>	<i>Non-core national accounts</i>
	<i>Sponsor</i>	<i>Gen gov't</i>
	<i>Column</i>	<i>G</i>
<i>Row Number</i>	<i>Supplementary Table item</i>	<i>2004-05 £ million</i>
	<b>Opening balance sheet</b>	
1	Pension entitlements	463,000
	<b>Transactions</b>	

2	Social contributions	46,000
2.1	Employer actual contributions	18,000
2.2	Employer imputed contributions	In 2.1
2.3	Household actual social contributions	In 2.1
2.4	Household social contribution supplements	28,000
3	Other (actuarial) accumulation of pension entitlements in social security pension funds	
4	Pension benefits	(18,000)
5	Changes in pension entitlements due to social contributions and pension benefits	28,000
6	Transfers of entitlements between schemes	<i>In row 4</i>
7	Changes in pension entitlements due to other transactions (e.g. arising from negotiated changes in scheme structure)	<i>Immaterial</i>
	<b>Other economic flows</b>	
8	Revaluations	15,000
9	Other changes in volume	25,000
	<b>Closing balance sheet</b>	
10	Pension entitlements	531,000

9	Other changes in volume	25,000
9.1	Changes in demographic assumptions	9,000
9.2	Experience Losses (Gains) includes prior year adjustment	16,000

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## Annex 1

### *Mandate of the Task Force*

 EUROPEAN COMMISSION  eurostat	 EUROPEAN CENTRAL BANK
Directorate C: National and European Accounts Unit C-5: Validation of public accounts	EUROPEAN CENTRAL BANK DIRECTORATE GENERAL STATISTICS

#### **Task Force on the statistical measurement of the assets and liabilities of pension schemes in general government**

### **MANDATE OF THE TASK FORCE**

#### Background

In the context of discussion of the recording of public pension and social security schemes in the ongoing review of SNA93 and the promotion of full government balance sheet information in the national accounts, there is a need to develop clear, complete and consistent rules and guidelines for the reporting of statistics on pension schemes in general government. There is also an opportunity to provide statistical input to the ongoing work on sustainability of public finances being led by DG ECFIN in cooperation with the Economic Policy Committee (and the AWG attached to it).

This Task Force is intended to deal with two related requirements:

- The need for a further analysis of the measurement of the liabilities<sup>1</sup> (and related assets) of pension schemes in general government, in the context of discussions on the revision of SNA93, and notably to analyse borderline issues between public employee pension schemes and the pension elements of social security schemes.
- Preliminary discussions on the sources and methods for measuring the liabilities (and related assets) of the pension elements of social security schemes.

There is a considerable amount of background material on both of these matters, both from work in European Union and also worldwide, which will need to be collated and summarised by Eurostat and the ECB in advance of the first Task Force meeting.

#### Mandate of the Task Force

The Task Force should undertake the following tasks:

- i) Review existing material on the measurement of pension schemes and social security classified in the general government sector<sup>2</sup>;
- ii) On the basis of this review, identify the statistical methodological issues which would need to be resolved to produce best possible estimates of these assets and liabilities. These issues will include investigation of the borderlines between social security and public employee schemes, and between schemes with actual liabilities accrued to date and schemes with contingent liabilities;

<sup>1</sup> Liabilities in this sense refer to those accrued to date, rather than the broader concept of all future liabilities whether or not accrued to date.

<sup>2</sup> It is unlikely that these funds have significant holdings of non-financial assets, however this should not be excluded in every case.

iii) Discuss and reach an agreement on the appropriate methodological approaches to be taken on the identified issues;

iv) Produce statistical estimates for as many past years as possible of the appropriate stocks and flows relating to these financial assets and liabilities, based on national accounting principles, for the participating Task Force countries.

v) Elaborate a methodological guidance note which could be used in non-Task Force countries for the purposes of preparing the best possible estimates of these assets and liabilities.

#### Members of the Task Force

The Task Force will be co-chaired by Eurostat and the ECB, and will be supported by a joint secretariat from these institutions. The following participants will be invited:

- A limited number of Member States' experts.
- DG ECFIN
- Observers from the OECD and IMF
- Experts in government accounting, demographics and pension and social security schemes as decided initially by the Chairpersons and/or by the Task Force during the course of its deliberations.

#### Timetable of the Task Force

The Task Force should meet twice during the course of 2006, with the first meeting to be held in September 2006.

Eurostat will prepare in consultation with the ECB for the end-January 2007 CMFB meeting an interim report of the work of the Task Force in which it summarises work-in-progress and provides those conclusions which will be of relevance for discussions of the treatment of public employee pension liabilities in the revised SNA93<sup>3</sup>.

The Task Force should in principle conclude its work by 1<sup>st</sup> May 2007, and the outputs of its work will be presented to the June 2007 CMFB meeting (notably a report on issues discussed, a methodological guidance note, and preliminary quantitative tables). These outputs may also be presented to, and discussed at, the FAWG and NAWG, so that all Member States have an opportunity to provide expert input. The outputs will also be subsequently presented to EPC / EFC sub-groups for information.

The Task Force should provide the agreed minutes of each Task Force meeting to the relevant statistical authorities of all Member States. It shall seek the input of other statistical experts, including the National and Financial Accounts Working Groups.

The Task Force should also consider a timetable for possible follow-up work.

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<sup>3</sup> It is recalled that the UN Statistical Committee will meet in March 2007 to finalise the SNA93 review issues. The input from the Task Force should provide a sound basis for discussions on treatment of employee pension schemes leading up to that meeting.

*Annex 2*  
*List of participants of the Task Force*

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### Annex 3

#### *Compromise on the treatment of employer pension schemes in the updated SNA*

Six "basic principles" which have been elaborated during collaboration between international bodies and have found widespread support amongst senior statistical staff in summer 2006:

- (i) All employer pension-related flows and stocks, including pension entitlements, provided by private schemes are recorded in the core accounts, even if they are unfunded. In this context a private scheme is any for which the government is not directly responsible (as noted in point (vi), even schemes for which government is responsible are included if they are mainly funded);
- (ii) The updated SNA will include a supplementary table on pensions which will become a standard requirement in the updated SNA. In this table, all flows and stocks of all pension schemes (autonomous pension funds, segregated non autonomous employer schemes, pension part of social security, etc.) will be shown. This table will thus include details of pension flows and stocks that are recorded in the core accounts plus those that are not included in the core accounts also giving a complete view of households' pension "assets";
- (iii) It is suggested that this supplementary table would be compulsory for European Union member states through ESA regulation.

#### *Concerning government sponsored systems:*

- (iv) Pension entitlements of unfunded, pay-as-you-go government sponsored systems which provide the basic social safety net type of provision, sometimes referred to as pillar one type provision, will be only recorded in the supplementary table (but not in the core account);
- (v) The recommendation of the updated SNA regarding the recording of unfunded pension schemes sponsored by government for all employees (whether private sector employees or government's own employees) will be flexible. Given the different institutional arrangements in countries, the updated SNA will permit recording only some of these pension entitlements in the core accounts. However, it will be a requirement that a set of criteria be provided to explain the distinction between those schemes carried forward to the core accounts, possibly where the pension promise is of sufficient strength, and those recorded only in the supplementary table. Providing a single set of internationally recognized criteria for this distinction should be on the long-term SNA research agenda; and
- (vi) Pension entitlements of funded systems sponsored by the government will be recorded in the core accounts.

*Annex 4*  
*Glossary*

<b>Term</b>	<b>Definition</b>	<b>Related terms</b>	<b>Identical terms</b>
Accrued benefits	The amount of accumulated pension benefits of a pension scheme member on the basis of years of service.		Accrued rights
Accrued-to-date liability	The amount calculated based on actuarial assumptions representing the present value of the pension benefits accrued in a pension scheme.	Actuarial valuation	Actuarial liability
Accumulated assets	The total value of assets accumulated in a pension scheme.		Accumulated contributions
Accumulated benefit obligation (ABO)	The actuarial present value of benefits, vested and non-vested, attributed to the pension formula to employee service rendered to a particular date, based on current salaries.	Projected benefit obligation (PBO)	
Active member	A pension scheme member who is making contributions (and/or on behalf of whom contributions are being made) and is accumulating assets.	Pension scheme member	
Actuarial assumptions	The various estimates (including assumptions related to changes in longevity, wage, inflation, returns on assets, etc.) that the actuary makes in formulating the actuarial valuation.	Actuary Actuarial valuation	
Actuarial liability		Actuarial valuation	Accrued-to-date liability
Actuarial valuation	A valuation carried out by an actuary on a regular basis, in particular to test future funding or current solvency of the value of the pension scheme's assets with its liabilities.		Valuation
Actuary	The person or entity whose responsibility, as a minimum, is to evaluate present and future pension liabilities in order to determine the financial solvency of the pension scheme, following recognised actuarial and accounting methods.		
Beneficiary	An individual who is entitled to a benefit (including the scheme member and dependants).		Pension scheme beneficiary
Benefit	Payment made to a pension scheme member (or dependants) after retirement.		Pension benefit Retirement benefit
Contribution	A payment made to a pension scheme by a scheme sponsor or a scheme member.		Social contribution
Contribution rate	The amount (typically expressed as a percentage of the contribution base) that is needed to be paid into the pension scheme.	Contribution base	Funding rate
Contributory pension scheme	A pension scheme where both the employer and the members have to pay into the scheme.	Non-contributory pension scheme	
Deferred pension	A pension arrangement in which a portion of an employee's income is paid out at a date after which that income is actually earned.	Deferred pensioner Deferred retirement	
Deferred pensioner	An individual who draws the pension benefits later than their normal retirement age.	Deferred pension Deferred retirement	
Deferred retirement	A situation when an individual decides to retire later and draw the pension benefits later than their normal retirement age.	Deferred pension Deferred pensioner Early retirement	Late retirement Postponed retirement
Deferred member	A pension scheme member that no longer contributes to or accrues benefits from the scheme but has not yet begun to receive retirement benefits from that scheme.	Inactive member	
Defined benefit (DB) pension scheme	Occupational schemes other than defined contribution schemes. DB schemes generally can be classified into one of three main types, "traditional", "mixed" and "hybrid" schemes.	"Traditional" DB scheme "Hybrid" DB scheme "Mixed" DB scheme Defined contribution (DC) pension scheme	
Traditional DB scheme	A DB scheme where benefits are linked through a formula to the members' wages or salaries, length of employment, or other factors.		
Hybrid DB scheme	A DB scheme where benefits depend on a rate of return credited to contributions, where this rate of return is either specified in the plan rules, independently of the actual return on any supporting assets (e.g. fixed, indexed to a market benchmark, tied to salary or profit growth, etc.), or is calculated with reference to the actual return of any supporting		

	assets and a minimum return guarantee specified in the scheme rules.		
Mixed DB scheme	DB scheme that has two separate DB and DC components but which are treated as part of the same scheme.		
Defined contribution (DB) pension scheme	Occupational pension scheme under which the scheme sponsor pays fixed contributions and has no legal or constructive obligation to pay further contributions to an ongoing scheme in the event of unfavourable scheme experience.		
Dependency ratio	Typically defined as the ratio of those of non-active age to those of active age in a given population.		
Early retirement	A situation when an individual decides to retire earlier and draw the pension benefits earlier than their normal retirement age.	Deferred retirement	Early leaver
Employer's pension scheme			Occupational pension scheme
Funded pension scheme	Occupational or personal pension scheme that accumulate dedicated assets to cover the scheme's liabilities.	Pay-As-You-Go (PAYG) scheme Unfunded pension scheme	
Funding	The act of accumulating assets in order to finance the pension scheme.		
Gross rate of return	The rate of return of an asset or portfolio over a specified time period, prior to discounting any fees of commissions.	Rate of return Net rate of return	
Inactive member		Deferred member	
Indexation	The method with which pension benefits are adjusted to take into account changes in the cost of living (e.g. prices and/or earnings).	Price indexation Wage indexation Mixed indexation	
Individual pension schemes	A pension scheme that comprises the assets of a single member and his/her beneficiaries, usually in the form of an individual account.	Group pension schemes Collective pension schemes Related pension schemes	
Late retirement			Deferred retirement
Mandatory contribution	The level of contribution the member (or an entity on behalf of the member) is required to pay according to scheme rules	Voluntary contribution	
Mandatory occupational schemes	Participation in these plans is mandatory for employers. Employers are obliged by law to participate in a pension scheme. Employers must set up (and make contributions to) occupational pension schemes which employees will normally be required to join. Where employers are obliged to offer an occupational pension scheme, but the employees' membership is on a voluntary basis, these schemes are also considered mandatory.		
Minimum pension	The minimum level of pension benefits the scheme pays out in all circumstances.		Minimum benefit
Mixed indexation	The method with which pension benefits are adjusted taking into account changes in both wages and prices.		
Money purchase scheme	A pension scheme providing benefits on a money purchase basis (ie the determination of an individual member's benefits by reference to contributions paid into the scheme in respect of that member, usually increased by an amount based on the investment return on those contributions)	Defined contribution scheme	
Mortality table	A chart showing rate of death at each age		
Multi-employer pension scheme	Scheme that pools the assets of a pension scheme established by various scheme sponsors. There are three types of multi-employer pension schemes: <i>a)</i> for related employers i.e. companies that are financially connected or owned by a single holding group (group pension schemes); <i>b)</i> for unrelated employers who are involved in the same trade or business (industry pension schemes); <i>c)</i> for unrelated employers that may be in different trades or businesses (collective pension schemes).		
Net rate of return	The rate of return of an asset or portfolio over a specified time period, after discounting any fees of commissions.	Gross rate of return	
Non-contributory pension scheme	A pension scheme where the members do not have to pay into the scheme.	Contributory pension scheme	
Notional defined contribution scheme	DB scheme as part of a hybrid scheme where benefits are based on notional funds	Hybrid DB scheme DB pension scheme	
Normal retirement age	Age from which the individual is eligible for pension benefits.		Normal pension age Retirement age
Occupational pension scheme	Access to such schemes is linked to an employment or professional relationship between the scheme member and the entity that establishes the scheme (the scheme sponsor). Occupational schemes may be established by employers or groups		Employer's pension scheme

	thereof ( <i>e.g.</i> industry associations) and labour or professional associations, jointly or separately. The scheme may be administered directly by the scheme sponsor or by an independent entity (a pension fund or a financial institution acting as pension provider). In the latter case, the scheme sponsor may still have oversight responsibilities over the operation of the scheme.		
Over-funding	The situation when the value of a scheme's assets is more than its liabilities, thereby having an actuarial surplus.		
Participant			Scheme member
Pay-As-You-Go (PAYG) scheme		Funded pension scheme	Unfunded pension scheme
Pension			Benefit
Pension assets	All forms of investment with a value associated to a pension scheme.		
Pension benefit			Benefit Retirement benefit
Pension fund	The pool of assets forming an independent legal entity that are bought with the contributions to a pension scheme for the exclusive purpose of financing pension scheme benefits. The scheme/fund members have a legal or beneficial right or some other contractual claim against the assets of the pension fund. Pension funds take the form of either a special purpose entity with legal personality (such as a trust, foundation, or corporate entity) or a legally separated fund without legal personality managed by a dedicated provider (pension fund management company) or other financial institution on behalf of the scheme/fund members.		
Pension scheme	A legally binding contract having an explicit retirement objective (or – in order to satisfy tax-related conditions or contract provisions – the benefits can not be paid at all or without a significant penalty unless the beneficiary is older than a legally defined retirement age). This contract may be part of a broader employment contract, it may be set forth in the scheme rules or documents, or it may be required by law. In addition to having an explicit retirement objective, pension schemes may offer additional benefits, such as disability, sickness, and survivors' benefits.	Pension fund	
Pension scheme sponsor	An institution ( <i>e.g.</i> company, industry/employment association) that designs, negotiates, and normally helps to administer an occupational pension scheme for its employees or members.		Scheme sponsor
Pensionable age			Normal retirement age
Pensionable service			Service period
Personal pension scheme	Access to this scheme does not have to be linked to an employment relationship. The scheme is established and administered directly by a pension fund or a financial institution acting as pension provider without any intervention of employers. Individuals independently purchase and select material aspects of the arrangements. The employer may nonetheless make contributions to personal pension schemes. Some personal schemes may have restricted membership.		
Postponed retirement			Deferred retirement Late retirement
Price indexation	The method with which pension benefits are adjusted taking into account changes in prices.	Wage indexation	
Projected Benefit Obligation (PBO)	The actuarial present value of vested and non-vested benefits attributed to the scheme through the pension benefit formula for service rendered to that date based on employees' future salary levels.	Accumulated Benefit Obligation (ABO)	
Rate of return	The income earned by holding an asset over a specified period.	Gross rate of return Net rate of return	
Replacement rate	The ratio of an individual's (or a given population's) (average) pension in a given time period and the (average) income in a given time period.		
Scheme member	An individual who is either an active (working or contributing, and hence actively accumulating assets) or passive (retired, and hence receiving benefits), or deferred (holding deferred benefits) participant in a pension scheme.	Active member	Member Pension scheme member
Scheme sponsor			Pension scheme sponsor
Separate accounts	A pension fund that is legally segregated from both the scheme sponsor and a financial institution that acts as the manager of the fund on behalf of the scheme member.		

Service period	The length of time an individual has earned rights to a pension benefits.		Pensionable service
Superannuation			Pension
Underfunding	The situation when the value of a scheme's assets is less than its liabilities, thereby having an actuarial deficiency.		
Unfunded pension scheme	Scheme that is financed directly from contributions from the scheme sponsor or provider and/or the scheme participant. Unfunded pension schemes are said to be paid on a current disbursement method (also known as the pay as you go, PAYG, method). Unfunded schemes may still have associated reserves to cover immediate expenses or smooth contributions within given time periods. Most OECD countries do not allow unfunded private pension schemes.		
Vested Benefit Obligation (VBO)	The actuarial present value, using current salary levels, of vested benefits only.		
Vested benefits			Vested rights
Vested rights	Deferred pensions for deferred pensioners, benefits accrued to active members and benefits of passive members.		Vested benefits
Voluntary contribution	An extra contribution paid in addition to the mandatory contribution a member can pay to the pension fund in order to increase the future pension benefits.	Contribution Mandatory contribution	
Wage indexation	The method with which pension benefits are adjusted taking into account changes in wages.	Price indexation	
Waiting period	The length of time an individual must be employed by a particular employer before joining the employer's pension scheme.		Qualifying period

Sources: Private pensions: OECD Classification and Glossary, OECD 2005: <http://www.oecd.org/dataoecd/5/4/2496718.pdf>