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Articles 83 and 83a and Annex XII of the Staff Regulations

**Report on the 2008 actuarial assessment of the
Pension Scheme for European Officials (PSEO)**

Reference date: 31 December 2007

REPORT

**Eurostat, Unit D-5 Remuneration and Pensions
Luxembourg, 1 September 2008**

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CONTENTS

INTRODUCTION

Article 83a and Annex XII of the Staff Regulations set out rules to guarantee the equilibrium of the PSEO (Pension Scheme of European Officials).

Article 83a(3) stipulates that on the occasion of the five-yearly actuarial assessment in accordance with Annex XII and in order to ensure the balance of the scheme, the Council shall decide on the rate of contribution and any change to the pensionable age. Article 83a(4) requires the Commission to present to the Council each year an updated version of the actuarial assessment, in accordance with Article 1(2) of Annex XII.

Finally, Article 83a(5) stipulates that for the purposes of paragraphs 3 and 4 of that Article, the Council is to act by a qualified majority on a proposal from the Commission, as provided for in the first indent of Article 205(2) of the EC Treaty. For the purposes of paragraph 3, the Commission's proposal is to be presented after consultation of the Staff Regulations Committee.

Annex XII lays down rules for implementing Article 83a of the Staff Regulations. In particular, it stipulates that:

- Eurostat is the authority responsible for the technical implementation of the Annex (see Article 13(1)),

- Eurostat will be assisted by one or more qualified independent experts in carrying out the actuarial assessments (see Article 13(2)),

- each year on 1 September, Eurostat is to submit a report on the assessment and updating referred to in Article 1 of the Annex (see Article 13(3)),

- any questions of methodology raised by the implementation of the Annex shall be dealt with by Eurostat in cooperation with national experts from the relevant departments of the Member States and the qualified independent expert or experts (see Article 13(4)).

Eurostat has drawn up the present report in accordance with the above legal requirements. This report sets out the results of the 2008 actuarial assessment of the pension scheme of the European civil service, based on the population of European officials as at 31 December 2007.

The report provides the information needed by the Commission to propose, if necessary, changes to the staff contribution rate and to the pensionable age in order to ensure the balance of the scheme.

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1. **CONTRIBUTION RATE**

    The 2008 actuarial assessment of the Pension Scheme for European Officials (PSEO) indicates that, in order to guarantee the equilibrium of the scheme, the contribution rate necessary to finance one third of the benefits payable would be **10.9%** of the basic salary (or invalidity allowance). This actuarial assessment was presented to the Article 83 Working Group at the 27 June 2008 meeting.

    According to Article 83a of the Staff Regulations, where it is shown that there is a gap of at least 0.25 points between the rate of contribution currently applied (10.25%) and the rate required to maintain actuarial balance (**10.9%**), the Council shall consider whether the rate should be adapted, in accordance with arrangements laid down in Annex XII[1]. This Annex also stipulates that any adjustment shall not lead to a contribution being more than one percentage point above or below the valid rate of the previous year[2].

    Consequently, as the gap between the calculated (10.9%) and the current (10.25%) contribution rates is more than 0.25 points, the contribution rate to be applied from **1 July 2008** should be 10.9%.

    The calculated contribution rate indicated above (10.9%) is one third of the ratio between the total of the service cost (1 002 million euros) and the total of annual basic salaries (3 056 million euros) (see Annex I, Tables I and II). This rate is *higher (+0.6%)* than the one calculated in 2007 (10.3%). This considerable increase is mainly explained by the fall in the interest rate and the update of the life table (see point 3 for further explanations about this change).

2. **UPDATE OF THE ASSESSMENT OF THE ACTUARIAL BALANCE**

    The PSEO was assessed on the basis of the computation method set out in Chapter 2 of Annex XII of the Staff Regulations.

    Compared to the 2004 assessment, a few minor changes were introduced in the methodology (some formulae were adapted to take some new categories of the population into account, according to the Staff Regulations in force since 1 May 2004). These changes have been applied since the 2006 assessment.

    An updated document concerning the calculation methodology is available and can be obtained from Eurostat on request.

    In addition, the following elements have been considered in the 2008 assessment:

    – The population of contributing members at 31 December 2007,

    – The update of the Real Discount Rate (RDR), General Salary Growth (GSG) rate, Individual Salary Progression (ISP) rate, Life table, Invalidity table and probability of being married by sex.

    More details about these updates are given in Annex I.

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[1]   Article 83a(4) of the Staff Regulations.
[2]   Article 2(1) of Annex XII to the Staff Regulations.

3. ANALYSIS OF THE CONTRIBUTION RATE CHANGE

As indicated in point 1, the official's pension contribution rate calculated this year (10.9%) is *higher* than the one calculated in 2007 (10.3%). This considerable increase (+0.6%) results from the combined effect of changes in the population structure and the main actuarial assumptions. The separate effects of these changes on the contribution rate is not easy to determine due to their interdependency, although analysis of the actuarial assumptions allows a better understanding of the changes in contribution rate and its sensitivity to the various actuarial assumptions.

Changes in actuarial assumptions and their impact on the contribution rate were presented at the 27 June 2008 meeting of the Article 83 Working Group (see document 20080627 Art83_06)

3.1. Real Discount Rate (RDR) change effect

The RDR decreases (3.1% as against 3.4% used in the 2007 calculation). This decrease (-0.3) has an impact of around +0.8 percentage points on the pension contribution rate. If the former RDR is used, 10.1% is obtained instead of 10.9%. This test, this year, confirms that the official's contribution rate sensitivity is about 2.5 times the change in the RDR.

3.2. General Salary Growth (GSG) change effect

The GSG decreases (0.4% as against 0.5% in the 2007 calculation). This decrease (-0.1) has an impact of around -0.3 percentage points on the pension contribution rate. If the former GSG rate is used, 11.2% is obtained instead of 10.9%. This test, this year, confirms that the official's contribution rate sensitivity is about 2.5 times the change in the GSG (similar to the RDR).

3.3. ISP change effect

The ISP decreased overall in the 2008 valuation (1.5%) compared to 2007 (1.6%). In practice, a different ISP rate by grade, step and years to retirement is applicable to officials and temporary agents of agencies and is used in the calculation. The overall decrease has a negligible impact, close to 0 percentage points, on the pension contribution rate compared with the one obtained with the former ISP table (10.9% is obtained in both cases).

3.4. Invalidity table effect

The probability of becoming invalid decreases if the most recently observed invalidity rates are taken into account. The invalidity table was consequently updated (2008 EU Invalidity table). The use of this updated table has an impact of around -0.1 percentage points on the pension contribution rate. A contribution rate of 11.0% instead of 10.9% is obtained if the former 2007 EU Invalidity table was used.

3.5. Life table effect (healthy persons)

According to the Staff Regulations the life table must relate to a population which has characteristics as close as possible to those of the population of members of the scheme. It is to be updated only on the occasion of the five-yearly actuarial assessment[3]. Consequently, the life table was updated on the occasion of this 2008 actuarial assessment.

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[3]   Article 9(2) of Annex XII to the Staff Regulations.

The former EU-2004 Life table was used in the annual assessments of the PSEO from 2004 to 2007. It was built by Eurostat in 2003 to take into account the population of members of the PSEO and was presented to the Article 83 Working Group at the April 2003 meeting.

The real mortality rate in the period 2004-2007 was analysed and compared to the expected mortality according to the EU-2004 Life table. The result of this analysis is that mortality in ages 30 to 69 is lower and mortality for ages above 70 is higher compared to the EU-2004 Life table. Further details about this analysis can be found in document 20080627 Art83_04.

Eurostat presented a pension assessment using a new life table with the new mortality rates to the Article 83 Working Group in June 2008. This new life table, the 2008 ICSLT (International Civil Servants Life Table), is the result of an ESTAT and JPAS[4] joint project aimed at drawing up a common life table based on a large population of civil servants posted in Europe. The methodology used to set up this life table is fully explained in document 20080627 Art83_05.

This life table has been certified by an external actuarial expert who also recommended the regular updating of life tables. It was used in the present calculation.

The use of the 2008 ICSLT instead of the former 2004 EU Life table in the present assessment has an impact of around +0.2 percentage points on the pension contribution rate. If the former mortality rates were used, 10.7% is obtained instead of 10.9%.

3.6. Life table effect (invalid persons)

It is normal actuarial practice to consider life expectancy of invalids as slightly shorter than that of healthy persons (e.g. Eurocontrol applies the mortality rate corresponding to a healthy person 3 years older than an invalid's age). This approach cannot be confirmed in the case of European civil servants as the number of invalids is too small for this. Eurostat considers this approach very logical and applied the same actuarial practice for the first time in this 2008 pension assessment.

The use of this approach makes hardly any change in the contribution because the probability of an active staff member becoming invalid is very small.

The implementation of this approach has a negligible impact, close to 0 percentage points, on the pension contribution rate (10.9% is obtained in both cases).

3.7. Assumed retirement age

Assumed retirement ages by staff groups were estimated on the occasion of the 2004 pension assessment, were presented at the June 2004 meeting of the Article 83 Working Group and have been used in pension assessments since 2004. These assumed retirement ages have been checked on the occasion of this 2008 pension assessment and no change was proposed at the June 2008 meeting of the Article 83 Working Group (for further details, see document 20080627 Art83_06).

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[4] The JPAS (Joint Pension Administrative Section) is a section working for the six Coordinated Organisations and attached to the OECD.

3.8. **Average difference between men and women**

The average age difference between men and women (3 years) that has been applied from 2004 in actuarial calculations should be used in future assessments. The result of a test based on population from 2004 to 2007 confirms that this actuarial assumption corresponds to reality. The test showed that on average married men are 3.01 years older than their partners and married women 3.18 years younger than their partners.

3.9. **Probability of being married for men and women**

Eurostat has analysed the recent (2004 to 2007) population of 46 418 officials and ex-officials older than 59 years and calculated the probability of them being married. The following probabilities were used in this 2008 pension assessment:

0.84 for men

0.38 for women

The change in probability of being married (0.84 instead of 0.90 in the past for men and 0.38 instead of 0.60 in the past for women) has an impact of around -0.1 percentage points on the pension contribution rate. If the former rates had been used, 11.0% would have been obtained instead of 10.9%.

3.10. **Loading factor for orphan's and divorced spouse's pension**

Current actuarial practice is to add 10% to a payable reversion pension to allow for the pension payable to orphans after the death of the surviving spouse (or of the official if there is no surviving spouse) and any pension payable to divorced spouses. Eurostat estimates that the impact of this factor on the contribution rate is minor and does not consider an update to this assumption necessary at the present time.

3.11. **Population change effect**

The impact of the population change on the pension contribution rate in the 2008 pension assessment is negligible. A contribution rate of 10.9% is obtained if the former population at 31 December 2006 were used in the calculation.

4. **COMPUTATION SYSTEM**

4.1. **Variables used in the assessment**

In general, two kinds of variables are used in the actuarial calculation:

Parameters. These are values mainly linked to the application of the Staff Regulations. These values change according to certain conditions related to the individual situation of each official (e.g. the annual accrual rate is 1.9% for staff recruited from 01.05.2004 and 2% for those recruited before this date). These values can be clearly established.

Actuarial assumptions. These are values that are not known and cannot be established exactly, such as the invalidity table, the ISP (Individual Salary Progression) table, the probability of being married at the retirement date, the coefficients for orphans and divorced spouses. The values of these actuarial assumptions were estimated in accordance with general actuarial practices and discussed with national experts from the relevant departments of the Member States at the annual meetings of the Article 83 Working Group.

A summary of the main variables used (parameters and actuarial assumptions) is given in Annex I, Tables III and IV.

4.2. **Demographic parameters**

4.2.1. *The reference population*

The observed population is made up of contributing members of the PSEO including:

– active officials,

– members whose pension contribution is optional (e.g. officials who have taken leave on personal grounds or parental leave),

– invalids who receive an invalidity allowance under Article 78 of the Staff Regulations,

– beneficiaries of an allowance for termination of service.

47 596 contributing members were recorded at 31.12.2007, which represents a net increase of **2 643** participants compared to the previous year (47 596 at 31.12.2006 were used in the 2007 actuarial assessment).

This significant increase in the population is mainly explained by the recruitment of "contract agents" (a new category of population defined in the Staff Regulations) and officials and temporary agents from the new Member States.

There are 7 037 "contract agents" among the contributing members at 31.12.2007, as against 6 404 at 31.12.2006, which represents an increase of 9.88%. Most of these new contributing members are replacing "auxiliary staff" (a former non-contributing staff category).

A breakdown of the reference population by type of contributing member and by Institution or Agency is included in Annex I, Tables VI to VIII.

4.3. **Economic parameters**

In accordance with Articles 10 and 11 of Annex XII to the Staff Regulations, the Real Discount Rate (RDR) and the General Salary Growth (GSG) are calculated (in

the 2007 update) as the average of the corresponding rates for the 12 preceding years (see Annex I, points 5.4.1 and 5.4.2 and Tables XIV and XV for more information).

The value of the Real Discount Rate is **3.1%** compared to 3.4% used in the 2007 actuarial assessment. The GSG is equal to **0.4%** instead of 0.5% used in 2007. Finally, an updated ISP table has been used, which globally represents a decrease in rates (**1.5**% instead of 1.6%) (See Annex I, point 5.4.3).

4.4.	**Technical implementation of Annex XII to the Staff Regulations**

Technical questions raised by the implementation of Annex XII are dealt with by Eurostat in cooperation with national experts from the relevant departments of the Member States participating in the Working Group on Article 83 of the Staff Regulations. The minutes of the meeting held in Luxembourg on 27 June 2008 (doc. 20080627_Art83WG _13) are reproduced in Annex III.

Eurostat also exchanges relevant information on actuarial issues with international organisations such as the JPAS (Joint Pensions Administrative Section of the Coordinated Organisations), EPO (European Patent Office) and Eurocontrol.

4.5.	**Independent examination**

In accordance with Annex XII, Article 13, of the Staff Regulations, Eurostat was assisted by a qualified independent expert (Ernst & Young Actuaires-Conseils, 11, allée de l'Arche, 92037 Paris La Défense cedex) with regard to the methodological implementation and the definition and calculation of the corresponding actuarial assumptions.

Ernst & Young Actuaires-Conseils then conducted an actuarial examination of the contribution rate calculated by Eurostat. This examination consisted in confirming the relevance and reliability of the actuarial processes and assumptions used in accordance with the methodology described in Annex XII to the Staff Regulations.

For the aspects not described explicitly in this Annex, Ernst & Young Actuaires-Conseils checked their compliance with generally accepted actuarial practices. Concerning actuarial assumptions, Ernst & Young Actuaires-Conseils carried out investigations to ensure that the underlying data provided by Eurostat were used correctly.

The executive summary of the assessment by Ernst & Young Actuaires-Conseils is included in Annex II.

Annexes to the report on the 2007 update of the 2004 actuarial assessment of the Pension Scheme for European Officials (PSEO)

Annex I   Computation

Annex II   Independent examination

5. ANNEX I — COMPUTATION

5.1. Relevant figures for calculating the contribution rate

Table I.   **Breakdown of the contribution rate**

Service cost	Total contribution rate (3/3)	Staff contribution rate (1/3)
Service cost for retirement	29.6%	9.9%
Service cost for invalidity	2.2%	0.7%
Service cost for death	1.0%	0.3%
Total service cost	**32.8%**	**10.9%**

Table II.   **Service cost and total amount of annual basic salaries**

Service cost	Total (EUR million)	%
- Service cost for retirement	905	90.3%
- Service cost for invalidity	65	6.5%
- Service cost for death	32	3.2%
Total service cost	**1 002**	**100.0%**
Total annual basic salaries and invalidity and termination allowances	**3 056**	**100.0%**

5.2. Summary of main variables

The following tables show the values of the main parameters (see Table III) and actuarial assumptions (see Table IV). Please note that the tables only present an overview of the main variables and are not exhaustive. Please refer to the Staff Regulations and the annexes thereto for precise and complete information.

Table III. Parameters used in the actuarial assessment

Parameter	Value
Legal source	Staff Regulations in force from 01.05.2004
Reference date for the population (Annex XII Article 1)	**31.12.2007**
Maximum official retirement age (Staff Regulations Article 52)	65
Minimum official retirement age (Staff Regulations Article 52 and Annex XIII Article 22)	63 or before for officials in service before 01.05.2004
Minimum age for early retirement (Staff Regulations Article 52, Annex VIII Article 9 and Annex XIII Article 23)	55 or before for officials in service before 01.05.2004
Category and grade for the minimum subsistence figure (Annex VIII Article 6)	first step of grade 1
Maximum retirement pension (Staff Regulations Article 77)	70% of the basic salary at the retirement date
Annual accrual rate (Article 77 of the Staff Regulations and Article 21 of Annex XIII)	1.9% or 2% for officials recruited before 01.05.2004
Bonus for officials in service after the normal retirement age (Annex VIII Article 5 and Annex XIII Article 22)	Barcelona incentive
Minimum retirement pension (Staff Regulations Article 77)	4% of the minimum subsistence figure per year of service
Invalidity allowance (Staff Regulations Article 78)	70% of the basic salary
Minimum invalidity allowance (Staff Regulations Article 78)	100% of the minimum subsistence figure
Reversion pension (Staff Regulations Article 79 and Annex VIII Article 18)	60% of the retirement pension
Minimum reversionary pension (Staff Regulations Article 79 and Annex VIII Article 18)	35% of the last basic salary
Survivor's pension (Staff Regulations Article 79 and Annex VIII Article 17)	60% of the retirement pension that would have been payable to the official
Minimum survivor's pension (Staff Regulations Article 79)	35% of the last basic salary or minimum subsistence figure

Table IV.   Actuarial assumptions

Actuarial assumption	Value
Average age difference between married men and women	3 years
Probability of being married for men	84%
Probability of being married for women	38%
Marital status	status at evaluation date
Coefficient for orphan's and divorced spouse's pension	10%
Annex VIII coefficient (correction coefficient)	0.0%
Assumed retirement age	63 to 64
Real discount rate (RDR)	3.1% (See point 2)
General salary growth (GSG)	0.4% (See point 3)
General pension revaluation (GPR)	0.4% (equal to the GSG)
Individual salary progression (ISP)	2008 ISP table
Mortality table (healthy people)	2008 ICSLT
Mortality table (Invalids)	Mortality rate corresponding to a person 3 years older than healthy person
Invalidity table	2008 EU Invalidity table

Many of these actuarial assumptions are explained in the following points. Some of them have changed compared to the 2007 actuarial assessment. The following table summarises these changes:

Table V.   Changes in actuarial assumptions

Variables	2007 assessment		2008 assessment	
	Remarks	Figures [1]	Remarks	Figures [1]
Real Discount Rate (RDR)	1995 - 2006 average	3.4%	1996 - 2007 average	3.1%
General Salary Growth (GSG)	1995 - 2006 average	0.5%	1996 - 2007 average	0.4%
Individual Salary Progr. (ISP)	2007 ISP table	1.6%	2008 ISP table	1.5%
Invalidity	2007 EU Inval.		2008 EU Inval.	
Mortality of healthy persons	2004 Life table		2008 ICSLT	
Mortality of invalids	2004 Life table		2008 ICSLT + 3 years	
Marriage probability by sex	2004 Probability	90% M, 60% F	2008 Probability	84% M, 38% F

(1) A weighted average of rates has been included in some cases in this column when several rates from a table are used in computation

5.3. Demographic parameters

5.3.1. Reference population

Annex XII, Article 1 of the Staff Regulations stipulates that the actuarial assessment shall be carried out in each year *n*, on the basis of the population of active members of the PSEO at 31 December of the previous year (*n-1*). On the other hand, Article 9 of this Annex provides that the population of participants in the scheme is to be collected annually by the Commission using information received from the different institutions and agencies whose staff are members of the scheme.

In accordance with these rules, the reference population is taken to be the staff at 31 December 2007 of the 37 institutions and agencies (30 were recorded at 31 December 2006) whose officials are members of the PSEO.

Table VI. Institutions and Agencies in the PSEO

Abbr.	Name
Institutions or assimilated organisms	
CDCE	COURT OF AUDITORS
CEC	EUROPEAN COMMISSION
COJED	COURT OF JUSTICE OF THE EUROPEAN COMMUNITIES
CONSIL	COUNCIL OF THE EUROPEAN UNION
COR	COMMITTEE OF THE REGIONS
CSC	ECONOMIC AND SOCIAL COMMITTEE
EDPS	EUROPEAN DATA PROTECTION SUPERVISOR
EO	EUROPEAN OMBUDSMAN
EUROPARL	EUROPEAN PARLIAMENT
Agencies	
CDT	TRANSLATION CENTRE FOR BODIES OF THE EUROPEAN UNION
CEDEFOP	EUROPEAN CENTRE FOR THE DEVELOPMENT OF VOCATIONAL TRAINING
CEPOL	EUROPEAN POLICE COLLEGE
CFCA	COMMUNITY FISHERIES CONTROL AGENCY
CPVO	COMMUNITY PLANT VARIETIES OFFICE
EAA	EXECUTIVE AGENCY FOR THE PUBLIC HEALTH PROGRAMME
EACEA	EDUCATION, AUDIOVISUAL AND CULTURE EXECUTIVE AGENCY
EACI	EXECUTIVE AGENCY FOR COMPETITIVENESS AND INNOVATION
EAR	EUROPEAN AGENCY FOR RECONSTRUCTION
EASA	EUROPEAN AVIATION SAFETY AGENCY
ECDC	EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL
ECHA	EUROPEAN CHEMICALS AGENCY
EEA	EUROPEAN ENVIRONMENT AGENCY
EFRA	EUROPEAN MONITORING CENTRE FOR RACISM AND XENOPHOBIA
EFSA	EUROPEAN FOOD SAFETY AUTHORITY
EMCDDA	EUROPEAN MONITORING CENTRE FOR DRUGS AND DRUG-ADDICTION
EMEA	EUROPEAN AGENCY FOR THE EVALUATION OF MEDICAL PRODUCTS
EMSA	EUROPEAN MARITIME SAFETY AGENCY
ENISA	EUROPEAN NETWORK AND INFORMATION SECURITY AGENCY
ERA	EUROPEAN RAILWAYS AGENCY
ETF	EUROPEAN TRAINING FOUNDATION
EUROFOUND	EUROPEAN FOUNDATION FOR THE IMPROVEMENT OF LIVING AND WORKING CONDITIONS
EUROJUST	JUDICIAL COOPERATION
FRONTEX	AGENCY FOR THE MANAGEMENT OF OPERATIONAL CO-OPERATION AT EXTERNAL BORDERS OF MEMBER STATES
ITER	EUROPEAN JOINT UNDERTAKING FOR ITER AND THE DEVELOPMENT OF FUSION ENERGY
OHIM	OFFICE FOR HARMONISATION IN THE INTERNAL MARKET
OSHA	EUROPEAN AGENCY FOR SAFETY AND HEALTH AT WORK
TNT-T	TRANS-EUROPEAN TRANSPORT NETWORK EXECUTIVE AGENCY

As approved by the Article 83 Working Group at its meeting of 7 June 2004, the term "active members of the PSEO" is considered in the wide sense to be synonymous with "contributing members of the PSEO". Consequently, the reference population includes not only officials in "active employment" but also officials in one of the other administrative statuses set out in Article 35 of the Staff Regulations, plus invalids who receive an invalidity allowance and beneficiaries of an allowance for termination of service.

Personnel data were collected from the NAP[5] (New Application for Pay), PMO[6] and directly from institutions and agencies, and imported into the Eurostat database. The data were checked to guarantee a high level of quality. The actuarial assessment is based on the best output from the Eurostat database at the calculation date.

Table VII. **Reference population by administrative status**

Population as at 31.12.2007

Contributing members	Total	%
Active		
- Officials	33 370	70.1%
- Temporary staff	6 362	13.4%
- Contract staff	7 037	14.8%
Non-active staff (1)	827	1.7%
Total population	**47 596**	**100.0%**

(1). Non-active status (Article 41), retirement in the interests of the service (Article 50), termination of service under special measures ("degagement"), invalids who receive an invalidity allowance under Article 78.

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[5] The NAP application is a centralised database that has been created to produce the monthly salary and pension forms for all institutions and agencies. This database contains a large part of the personnel data, particularly amounts paid and pension contributions.

[6] PMO use the Sysper database of the Commission to store data about transfers of pension rights of the staff of the Commission and agencies, and data about pensioners.

Table VIII.   Reference population by institution or agency

Population as at 31.12.2007

Institution or Agency	Total	%
European Commission	30 213	63.48%
European Parliament	6 130	12.88%
Council of the European Union	3 300	6.93%
Court of Justice of the European Communities	1 941	4.08%
Court of Auditors	866	1.82%
Economic and Social Committee	742	1.56%
Committee of the Regions	493	1.04%
Other small institutions and decentralised Community agencies	3 911	8.22%
Total	**47 596**	**100.00%**

Figure I.   Reference population by age
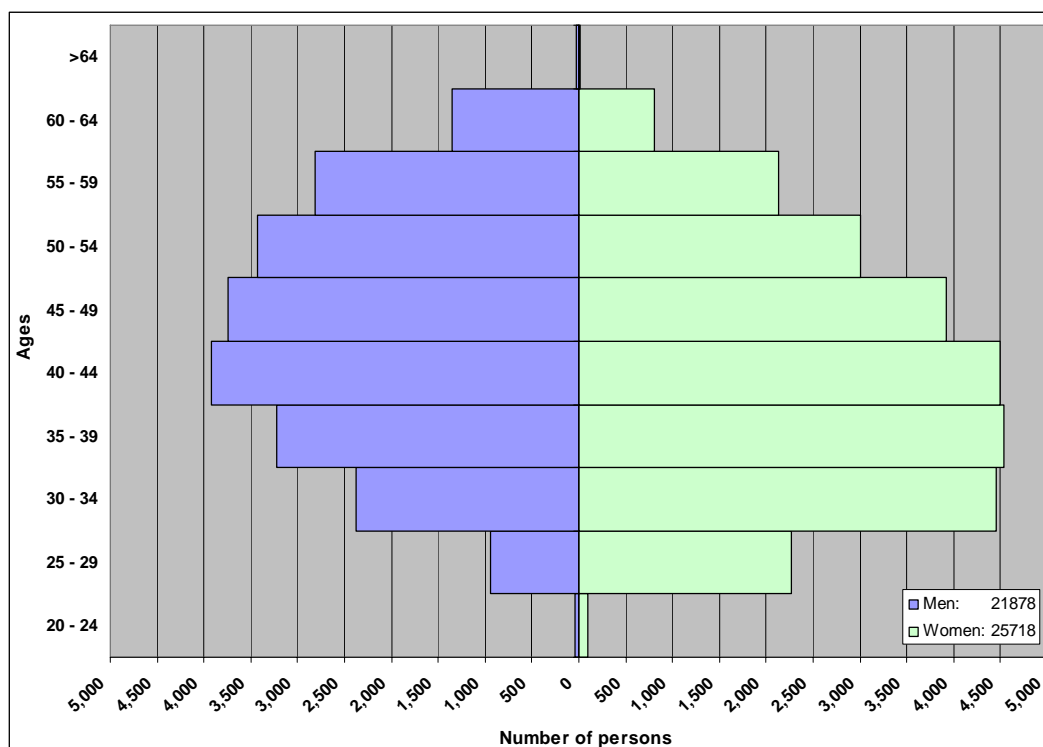
Table IX. **Change in the population of contributing members as at 31.12.2006 compared to the population as at 31.12.2005**

Changes	Total
Reference population used in the 2007 assessment (contribuiting members as at 31.12.2006)	44 953
Contributing members who left the pension scheme or became pensioners	-2 019
New contributing members as at 31.12.2007	4 662
Reference population used in the 2008 assessment (contribuiting members as at 31.12.2007)	47 596
Net change	**2 643**

This increase in the population is mainly explained by the recruitment of "contract agents" (a new category of population defined in the Staff Regulations) and officials and temporary agents from the new Member States.

5.3.2. *Assumed retirement age*

As stipulated in Article 4 of Annex XII to the Staff Regulations, it is assumed that all retirements will occur at a fixed average age (*r*). The average retirement age may be different by group of staff.

Table X. **Assumed retirement age and Barcelona incentive by age group of officials**

Staff group (age and years of service as at 30.04.2004)		Annual accrual rate	Barcelona incentive	Barcelona incentive maximum	Normal retirement age	Assumed retirement age (4)	
			(1)	(2)	(3)	Actives	Invalids
Group 1	Old Staff Regulations	2.00%	(5)		60	**63**	**65**
Group 2	>= 50 years old or >= 20 years of service	2.00%			60	**63**	**63**
Group 3	40 - 49 years old and < 20 years of service	2.00%	3.00%	4.50%	61	**63**	**63**
Group 4	35 - 39 years old and < 20 years of service	2.00%	2.75%	4.00%	62	**63**	**63**
Group 5	30 - 34 years old and < 20 years of service	2.00%	2.50%	3.50%	63	**64**	**64**
Group 6	< 30 years old and < 20 years of service	2.00%	2.00%	-	63	**64**	**64**
Group 7	New officials (after 30.04.2004)	1.90%	2.00%	-	63	**64**	**64**

(1) The Barcelona incentive corresponds to an increase in pension expressed as a percentage of the last basic salary (Article 5 of Annex VIII and Article 22 of Annex XIII).

(2) The Barcelona incentive maximum is a percentage of the total pension rights acquired by an official at the age of 60 (Article 5 of Annex VIII and Article 22 of Annex XIII).
For example, the Barcelona incentive for officials aged between 40 and 49 is 3% of the last basic salary but not exceeding 4.5% of the pension rights acquired by those officials at the age of 60.

(3) The age in this column is the simple average of ages from the table detailed in Article 22 of Annex XII, rounded to entire year. This average is calculated only to facilitate the presentation in this table.
In practice, institutions apply the table detailed in Article 22 of Annex XIII when calculating individual rights. Eurostat does not use this column when calculating the contribution rate for pension; assumed retirement ages detailed in columns (4) are used instead.

(4) In accordance with to Article 3 of Annex XII, it is assumed that all retirements (except for invalidity) will occur at a fixed average age.
This column shows these average ages by staff group, which have been deducted from the observations in accordance with Article 9 of Annex XII.

(5) Officials, aged 50 years or over or with 20 or more years service as at 30/04/2004, who remain in service after the normal retirement age are entitled, for each year worked after that age, to an increase in their pension equal to 5% of the amount of the pension rights acquired at the age of 60 (the same premise was applied in the past under the former Staff Regulations)..

Invalidity table

A first invalidity table (2004-EU Invalidity table) was used in the 2004, 2005 and 2006 assessments of the PSEO. This invalidity table was presented to the Article 83 Working Group at its 7 June 2004 meeting.

The table was updated on the occasion of the 2007 actuarial assessment to take account of the evolution of beneficiaries of *invalidity allowance* (a new category of population under the new Staff Regulation in force from 1 May 2004). This new table was presented to the Article 83 Working Group at its 26 June 2007 meeting (see document 20070623 Art83 WG 07 Assumptions EN, available on CIRCA) and it was decided to update the table each year using as input a moving average of 5 years of invalidity observation.

The following table shows the number of invalids from 2004 to 2007.

Table XI. Invalids by year

Year	Invalids
2004	103
2005	122
2006	108
2007	88
Total	**421**

The following graph shows the distribution of the invalids above by age. A considerable increase in invalidity occurs between ages 44 and 60. Invalidity is practically nil before the age of 35.

Figure II. New invalids by age — 2004 to 2007 total
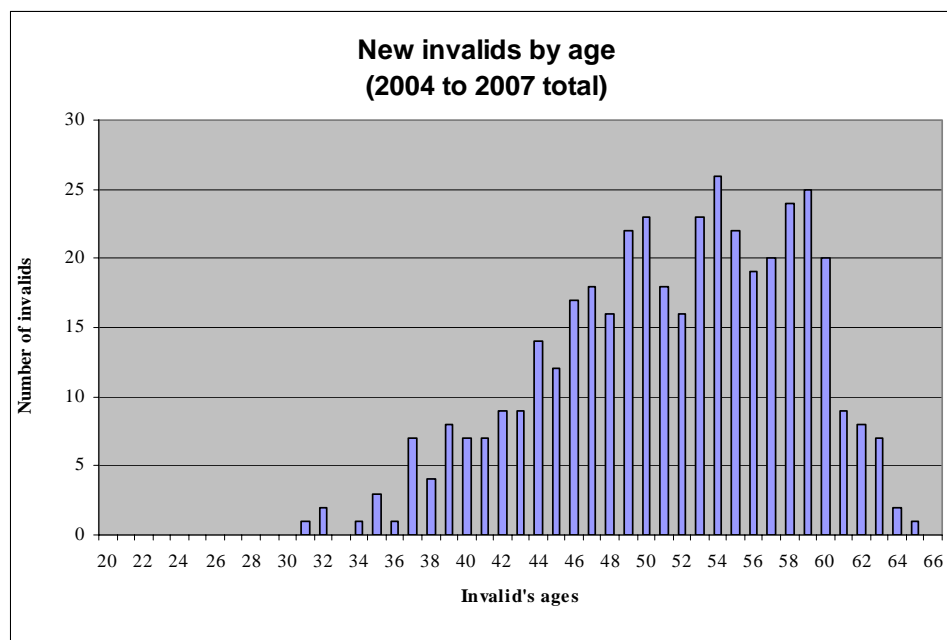
These invalidity observations have been used to update the invalidity table by sex (2008-EU Invalidity table). The following table is an extract from the unisex version

of the table. The unisex version is only used for presentation, while the complete table by sex is used in computation.

Table XII. 2008-EU Invalidity table — Unisex version

Age	Invalidity (probability of becoming an invalid)
x	q'_x
20	0.000059
25	0.000075
30	0.000256
35	0.000752
40	0.001486
45	0.002885
50	0.004345
55	0.006015
60	0.006520
65	0.003737

5.3.4. *Life table of healthy persons*

The EU-2004 Life table was built by Eurostat in 2003 to take into account the population of members of the PSEO and was presented to the Article 83 working group at the April 2003 meeting. As indicated in document Art83 20030411_05[7], this table was based on an average of some national life tables from Member States and adjusted to take account of the population of EU civil servants.

This table was used in the annual assessments of the PSEO from 2004 to 2007.

The real mortality rate in the period 2004-2007 was analysed and compared to the expected mortality according to the EU-2004 Life table. The result of this analysis is that mortality in ages 30 to 69 is lower and mortality for ages above 70 is higher compared to the EU-2004 Life table.

In addition, Eurostat (European Commission) and the Joint Pension Administrative Section (the JPAS is a section working for the six Coordinated Organisations and attached to the OECD) have launched a joint project aimed at drawing up a common life table based on a large population of civil servants posted in Europe: the 2008 ICSLT (International Civil Servants Life Table). This life table should be used in actuarial calculations related to the pension schemes of these civil servants. Both institutions started the project in 2005. The methodology used to set up this life table was presented to the Article 83 Working Group at the 27 August 2008 meeting (document 20080627 Art83_05, available from Eurostat).

The analysis of mortality mentioned above and the result of the Eurostat-JPAS project lead to the following conclusions:

– The 2004 EU Life table should not be used in future owing to the gap between expected deaths according to the life table and observed deaths in the period 2004 to 2007, which is large, particularly for men.

– The 2008 ICSLT is the result of an in-depth statistical analysis and mathematical modelling process, whereas the former 2004 EU Life table was based on national life tables from Member States. The probability of dying according to this new

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[7] Documents Art83 20030411_05 (concerning actuarial assumptions) and Art83 20030411_07 (minutes of the 14.04.2003 Art83 WG meeting) are available from Eurostat.

life table seems to be more realistic than the former 2004 EU Life table. In addition, it represents a qualitative improvement in the field of harmonisation at international and EU levels.

Consequently, the 2008 ICSLT has been used in the 2008 pension assessment.

The following table is an extract from this table:

Table XIII. 2008 ICSLT

Age	Men	Women
	Dying probability	Dying probability
x, y	qx	qy
40	0.00063370	0.00054775
45	0.00106107	0.00092086
50	0.00176523	0.00152344
55	0.00282667	0.00242203
60	0.00481751	0.00372321
65	0.00838934	0.00605132
70	0.01458993	0.01074871
75	0.02531453	0.01863843
80	0.04374552	0.03307728
85	0.07506895	0.05836406
90	0.12727809	0.10193574

5.3.5. *Life table of invalids*

It is normal actuarial practice to consider life expectancy of invalids as slightly shorter than that of healthy persons (e.g. Eurocontrol applies the mortality rate corresponding to a healthy person 3 years older than an invalid's age). This approach cannot be confirmed in the case of European civil servants as the number of invalids is too small. Eurostat considers this approach very logical and suggests applying the same actuarial practice in its own actuarial calculations.

The use of this approach makes hardly any change in the contribution because the probability of an active staff member becoming invalid is very small.

The implementation of this approach in the 2008 pension assessment had a negligible impact, close to 0 percentage points, on the pension contribution rate (10.9% is obtained whether this assumption is used or not).

5.3.6. *Average age difference between men and women*

The average age difference between men and women (3 years) that has been applied from 2004 in actuarial calculations should be used in future assessments. The result of a test based on population from 2004 to 2007 confirms that this actuarial assumption corresponds to reality. The test showed that on average married men are 3.01 years older than their partners and married women 3.18 years younger than their partners.

5.3.7. *Probability of being married for men and women*

The probabilities for each sex of being married at retirement age used in the actuarial calculations up to the 2007 assessment were calculated in 2004 on the basis of the information then available. The probabilities were:

0.90 for men

<div align="center">0.60 for women</div>

Eurostat analysed the recent (2004 to 2007) population of 46 418 officials and ex-officials older than 59 years and calculated the probability of them being married. The probabilities found for men and women are:

<div align="center">0.84 for men (0.8 to one decimal place)</div>

<div align="center">0.38 for women (0.4 to one decimal place)</div>

These updated probabilities were used in this 2008 pension assessment.

5.4.   Economic parameters

5.4.1.   Real Discount Rate (RDR)

Annex XII, Article 10 of the Staff Regulations provides that:

1. The interest rates to be taken into consideration for the actuarial calculations shall be based on the observed average annual interest rates on the long-term public debt of Member States as published by the Commission. An appropriate consumer price index shall be used to calculate the corresponding interest rate net of inflation as needed for the actuarial calculations.

2. The effective annual rate to be taken into consideration for the actuarial calculations shall be the average of the real average interest rates for the 12 years preceding the current year.

Consequently, Real Discount Rates (RDRs) from 1996 until 2007 have to be used in the 2008 assessment of the PSEO.

Nominal discount rate (average of 1996 to 2007 nominal yields of Euro area zero-coupon government bonds with a maturity of 21 years, 21 years being the duration of the scheme, the rate in 2007 as produced by the ECB being 4.5%): **5.3%**

Inflation rate (average of 1996 to 2007 appropriate consumer price indices, the HICP of the EU area in 2007 being 2.3%): **2.1%**

Real Discount Rate (average of 1996 to 2007 Real Discount Rates, the last being calculated as 100*(100+NDR)/(100+IR)-100)): **3.1%** (it was 3.4% in the assessment at 31.12.2006).

The 12-year moving average of Real Discount Rates (RDRs) that has been calculated this time (3.1%) has been used in the present assessment of the PSEO.

<div align="center">**Table XIV. Real Discount Rate (RDR)**</div>

Year	Nominal rate (1)	Deflator index (2)	Real discount rate (3)
~~1995~~	~~8.3~~	~~3.0~~	~~5.1~~
1996	7.2	2.6	**4.5**
1997	6.1	2.1	**3.9**
1998	4.9	1.7	**3.1**
1999	5.6	1.1	**4.5**
2000	5.9	2.4	**3.4**
2001	5.7	2.5	**3.1**
2002	5.5	2.2	**3.2**
2003	5.1	2.0	**3.0**
2004	5.0	2.1	**2.8**
2005 (04)	4.0	2.2	**1.8**
2006 (04)	4.2	2.2	**2.0**
2007	4.5	2.3	**2.2**
~~Aver. 1995 - 2006~~	~~5.6~~	~~2.2~~	~~3.4~~
Aver. 1996 - 2007	**5.3**	**2.1**	**3.1**

(1) Till 1998: long-term government borrowing rates. Since 1999: Euro zero-coupon government bond curve with a maturity of 21 years.

(2) Till 1998: National Accounts private consumption deflator. Since 1999: Harmonised Index of Consumer Prices (HICP).

(3) The values in column 3 are obtained using the common formula for deflation i.e.:
col.3 = 100 * (100 + col.1) / (100 + col.2) - 100

(4) Nominal rate estimated by Eurostat (data not available at ECB)

5.4.2. *General Salary Growth (GSG)*

As for the discount rate, Annex XII contains specific rules for calculating General Salary Growth. Article 11 stipulates on the one hand that the annual change in salary scales to be used for the actuarial calculations must be based on the specific indicator (SI) and, on the other hand, that the effective annual rate is to be the average of the net SIs for the 12 years preceding the current year.

As the net specific indicator obtained in 2007 is -0.4%, the 12-year moving average from 1996 to 2007 is 0.4% (see Table IV). The estimate of the GSG consequently decreases between 2006 and 2007 from 0.5% to 0.4%.

Table XV. General Salary Growth

Year	Specific Indicator
~~1995~~	~~0.2~~
1996	-0.1
1997	0.7
1998	0.5
1999	1.8
2000	-0.1
2001	0.6
2002	1.7
2003	1.1
2004	-1.2
2005	0.0
2006	0.2
2007	-0.4
~~Aver. 1995 - 2006~~	~~0.5~~
Aver. 1996 - 2007	**0.4**

5.4.3. *Individual Salary Progression (ISP)*

Individual Salary Progression (ISP) refers to the salary increase due to the career advancement of EU officials, i.e. promotions and seniority steps.

The ISP has a significant impact on the contribution rate, but not as much as the RDR and GSG.

Furthermore, with the introduction of the new Staff Regulations on 1.5.2004, the career progression of EU officials has been completely reviewed. Annex XIII to these Staff Regulations includes transitional measures which made the determination of this assumption quite complicated.

2007 ISP rates to be applied to officials and temporary staff from agencies (ISP groups 1 and 2) have been updated to take account of the observed promotion rates from 2005 to 2007 (methodology agreed at the June 2006 Art83WG meeting).

The 2007 fixed ISP rate of 0.4% to be applied to temporary staff from institutions (ISP groups 3 and 5) remains unchanged.

The ISP for group 5 was first estimated in May 2004 for the then new category of contract agent. No actual information on salary progressions was available at the time.

Contract agents working in institutions are limited to contracts of 3 years, while those working in agencies may have contracts of longer duration. The proportion of

contract agents working in institutions, and therefore being limited to 3-year contracts, on 31.12.2007 was **89.4**%. The possibilities for promotion to a higher function group during an average contract period are therefore rather limited. Within a function group, the average salary increase for advancement between steps is 2.08%.

These factors together suggest that the value of 1% for the ISP for group 5 was too high. A new estimation was carried out based on observation of the real population of contract agents on 31.12.2007.

7 037 contract agents were recorded at 31.12.2007, which represent 14.8% of active population.

The 2007 ISP table (rates by grade and step and number of years to retirement) has been updated and used in the 2008 assessment of the PSEO. This update concerns exclusively ISP groups 1, 2 and 5. The fixed ISP concerning groups 3 and 4 (0.4%) that was decided at the June 2006 meeting of the Article 83 Working Group remains unchanged. The following table shows weighted ISP rates for publication purposes.

Table XVI. Weighted ISP rates by group of active population and grade

Grades	Population groups for ISP calculation [1]					Average
	1	2	3	4	5	
18	x	x	x	x	0.2%	1.0%
17	x	x	x	x	0.2%	1.0%
16	0.1%	x	0.4%	x	0.2%	0.7%
15	0.8%	0.9%	0.4%	0.4%	0.2%	0.8%
14	1.0%	1.3%	0.4%	0.4%	0.2%	0.9%
13	0.9%	0.7%	0.4%	0.4%	0.2%	0.9%
12	1.1%	1.2%	0.4%	0.4%	0.2%	1.0%
11	1.3%	1.5%	0.4%	0.4%	0.2%	1.2%
10	1.7%	1.8%	0.4%	0.4%	0.2%	1.4%
9	1.8%	1.9%	0.4%	0.4%	0.2%	1.6%
8	1.9%	2.1%	0.4%	0.4%	0.2%	1.4%
7	2.2%	2.3%	0.4%	0.4%	0.2%	1.8%
6	2.1%	2.1%	0.4%	0.4%	0.2%	1.9%
5	1.7%	2.0%	0.4%	0.4%	0.2%	1.4%
4	2.2%	1.9%	0.4%	0.4%	0.2%	1.7%
3	2.3%	2.0%	0.4%	0.4%	0.2%	1.8%
2	2.4%	2.2%	0.4%	0.4%	0.2%	1.5%
1	2.1%	2.1%	0.4%	0.4%	0.2%	1.4%
Average	1.7%	2.0%	0.4%	0.4%	0.2%	1.5%

(x) No weighted average for ISP is calculated (grey cells in the table) where nobody is present in the reference population for the corresponding grade and ISP group. In particular, grades 17 and 18 concern only contract staff.

(1) Population groups for ISP calculation:
1. Officials, together with temporary staff of agencies, recruited before 01.05.2004
2. Officials, together with temporary staff of agencies, recruited from 01.05.2004 onwards
3. Temporary staff of institutions recruited before 01.05.2004
4. Temporary staff of institutions recruited from 01.05.2004 onwards
5. Contract staff recruited from 01.05.2004 onwards

ISP rates in the table above are the average of ISP rates weighted by the population in each grade. These average rates are calculated for publication purposes only, the detailed rates by grade and years to retire being used in computation.

5.4.4. *Loading factor for orphan's and divorced spouse's pension*

Current actuarial practice is to add 10% to a payable reversion pension to allow for the pension payable to orphans after the death of the surviving spouse (or of the official if there is no surviving spouse) and any pension payable to divorced spouses.

Eurostat estimates that the impact of this factor on the contribution rate is minor and the same assumption has been used in the 2008 actuarial assessment.

5.5.   Annuities

Articles 6 to 8 of Annex XII to the Staff Regulations refer to the annuities used in the calculation. The values of these annuities according to age are presented below.

In order to comply with Commission policy on equal opportunities, values are not presented by sex. However, Eurostat conducted its analyses taking into account all relevant features of the population, including sex. The figures are aggregated by weighted averages only for presentation in this report.

The table below was calculated using:

– the Real Discount Rate (RDR) from Table XIV,

– the General Salary Growth (GSG) from Table XV,

– an assumed retirement age (r) equal to 64 years of age for officials younger than 35 on the reference date (31.12.2003) and equal to 63 years of age for the others,

where:

x is the age of the official,

y is the age of the official's spouse,

$m = r - x$ (number of years between the official's age and the assumed retirement age),

$y = x \pm 3$ according to the sex of the official.

Table XVII.   Some annuities in accordance with Articles 6 to 8 of Annex XII to the Staff Regulations

Age	Immediate deferred		Immediate temporary		Age	Immediate annuity at age y
	annuity at age x	reversionary annuity at ages x and y	annuity at age x	reversionary annuity at ages x and y		
x	$_{m\|}a_x$	$_{m\|}a_{xy}$	a_x	a_{xy}	y	a_y
21	4.077145	0.939091	25.371470	0.198593	21	30.212143
25	4.667679	0.938329	24.026901	0.195879	25	29.480909
30	5.420817	1.139633	22.118410	0.205743	30	28.327258
35	6.698698	1.451006	19.497368	0.252718	35	26.988274
40	7.797944	1.729317	16.959862	0.247324	40	25.507685
45	9.101766	2.028546	14.080749	0.223312	45	23.860605
50	10.613837	2.440535	10.814064	0.175803	50	21.993263
55	12.487924	2.772258	7.102896	0.102601	55	19.996073
60	14.710368	3.241113	2.856729	0.026595	60	17.744328
63	16.291496	3.541697	0.000000	0.000000	63	16.291496

$_{m\|}a_x$ is described in Annex XII of the Staff Regulations, Article 6 § 3a

$_{m\|}a_{xy}$ is described in Annex XII of the Staff Regulations, Article 6 § 3b

a_x is described in Annex XII of the Staff Regulations, Article 7 § 2a

a_{xy} is described in Annex XII of the Staff Regulations, Article 7 § 2b

a_y is described in Annex XII of the Staff Regulations, Article 8 § 2

6.   ANNEX II — INDEPENDENT EXAMINATION

Ernst & Young Actuaires-Conseils conducted an actuarial examination of the contribution rate calculated by Eurostat. This examination consisted in confirming the relevance and reliability of the actuarial processes and assumptions used in accordance with the methodology described in Annex XII to the Staff Regulations. For the elements not described explicitly in this Annex, Ernst & Young Actuaires-Conseils checked their compliance with generally accepted actuarial practices. Regarding the actuarial assumptions, Ernst & Young Actuaires-Conseils carried out investigations to ensure that the underlying data provided by Eurostat were used correctly.

The executive summary from the Ernst & Young report on the actuarial examination is reproduced below:

In accordance with its assignment entrusted by Eurostat, Ernst & Young Actuaires-Conseils, as an independent expert, has conducted an actuarial examination of the 2008 update of the 2004 actuarial assessment of the pension scheme referred to in Article 83a (3) of the new Staff Regulations for which Eurostat endorsed the technical responsibility towards the Commission according to the Annex XII "Rules for implementing Article 83a of the Staff Regulations". This examination consisted in confirming the relevance and the reliability of the actuarial processes and assumptions used in accordance with the methodology described in Annex XII to evaluate the contribution rate of officials.

For the aspects explicitly mentioned in Annex XII, we did not detect any elements likely to cast doubt that the calculations determined by Eurostat are not compliant with the rules of Annex XII.

For the aspects not described explicitly in Annex XII, we have checked their compliance with the generally accepted actuarial practices and we did not detect any significant difference with the methodology and the assumptions we would have chosen ourselves to perform the calculations.

Ernst & Young Actuaires-Conseils has no reasons to doubt that the official's contribution rate (10.9%) calculated by Eurostat and presented at the 27th June 2008 meeting of the Article 83 Working Group is a sufficiently accurate estimate of the reality. However, we note that a progressive table could be used in the future to better reflect the life improvement (See 6.2.2).

The complete Ernst & Young report on the actuarial examination of the contribution rate is available from Eurostat.