CONFIDENTIAL

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TECHNICAL NOTE TO THE NATIONAL ACTUARIAL AUTHORITY

Actuarial projection results of the National pension schemes of IKA and OGA as of 31 December 2005

International Financial and Actuarial Service
Social Security Department
International Labour Office

Geneva, 29 January 2008

Abbreviations and acronyms

EU AWG	European Union Ageing Working Group
GAD	Governmental Actuary's Department
GAP	General Average Premium
GDP	Gross Domestic Product
IKA	Idrima Kinonikon Asfaliseon (Social Insurance Institute)
ILO	International Labour Office/Organisation
ILO/FACTS	International Financial and Actuarial Service of the ILO
OGA	Organismos Georgikon Asfaliseon (Agricultural Insurance Organisation)
PAYG	Pay-as-you-go
PV	Present value
TFR	Total fertility rate

Executive Summary

Introductory comments

It is worth recalling the main purpose of the actuarial project between the ILO and the NAA to help refine and develop the actuarial modelling tools at the National Actuarial Authority level. The International Financial and Actuarial Service of the ILO Social Security Department is mandated under the technical cooperation project between the ILO and the National Actuarial Authority of Greece (NAA) entitled "Actuarial support to the National Actuarial Authority of Greece (GRE/06/01/GRE)" to deliver a set of outputs to assist the NAA in building up its own national capacities and modelling tools applied to conduct the regular actuarial valuation of the Greek public pension system.

The ILO appointed a team of actuaries of the International Financial and Actuarial Service of the Social Security Department consisted of Mr Charles Crevier and Mr Florian Léger. They worked under the supervision and coordination of Ms Anne Drouin. Mr Gilles Binet was intensively involved in the technical supervision of the actuarial work under this project and is the official peer reviewer of this project. A "Peer Review Statement" is attached to the present report in Appendix V. Mr Wolfgang Scholz reviewed the macro-economic projection frame.

The actuarial projections are performed as of the valuation date of 31 December 2005. The valuation period is of 50 years, i.e. ending in year 2055. Projections assumed the financing and benefit provisions governing the IKA and OGA schemes as of 31 December 2005 remain unchanged in future according to a status quo basis.

Actuarial projections are based on assumptions on demographic and economic variables that are mutually consistent. No administration costs are included in the projections. The general population and macro-economic variables were mostly projected on the basis given by the EU Ageing Working Group. Some reservations are expressed below.

The statistical database and general information relevant to the IKA and OGA schemes was duly provided to the ILO through the National Actuarial Authority. Much effort had to be invested to understand as best as possible the legislation of the schemes as no official translation was available and several legislation texts had to be referred to in order to establish the initial database as of the actuarial valuation date, to establish scheme-specific assumptions and to codify the benefit provisions of the schemes. The ILO is satisfied in general with the exception of a limited number of areas where improvements could not go further in view of too limited information made available for different and justified reasons. The identification of those areas of improvement will be useful to provide guidance for improving the quality of future actuarial valuations.

It is important to bear in mind the inherent high degree of uncertainty when projecting the long-term benefit promises of the national pension system, in this case for 50 years. This is inevitable for any pension actuarial valuation. The sensitivity of the financial results to variations in each variable, and in aggregate, needs to be taken into account. The key details of the projection results are provided in the report.

It is worth mentioning in the case of IKA that the Committee of Experts of the ILO has noted that the persons victim of a partial invalidity due to a work injury receive inadequate benefit protection.

IKA

From the experience analysis of the inter-valuation period covering the financial period from 31 December 2000 to 31 December 2005, the most important finding is that the demographic pressure on the pension scheme has increased as the ongoing ageing development has continued progressively during that period. The bulk of the rise in the number of pensioners comes from the old age and survivors' benefits. As forecasted in the previous actuarial valuation, the annual deficit had increased in the last 5 years. However, it is worth mentioning that the financial situation has proved to be in a slightly more favourable situation than expected.

The highlights of the projections are as follows in the event where actual experience in future would be in line with the assumptions presented under the base scenario:

- The ratio of the number of active contributors to every pensioner in 2055 will be less than half of what it was in 2005, i.e. decreasing from 2.51 contributors per pensioner in 2005 to 0.99 contributors per pensioner in 2055. This appears to reflect not only the general ageing process, but also the impact of the possibility for active people to retire relatively early as their life expectancies increase.

- The IKA projected pay-as-you-go (PAYG) cost rate as a percentage of the insurable earnings will remain largely above the current contribution rate of 21 per cent. From 26.1 per cent in 2005 to 59.3 per cent in 2055, the projected PAYG cost rate is projected to increase to a level equivalent to nearly three times the level of the contribution rate if it remains at its current level. This is mainly due to the steady increase of old age benefits.

- The annual deficit will be fairly stable for the next 15 years at about 0.6/0.7 per cent of GDP. This is partly explained by the relatively young age of the existing IKA insured population who will begin retiring at a later stage. However, the deficit will increase steadily from 2020 up to 2055, when it is expected to be around 7 per cent of GDP.

The driving cost factor is closely related to the retirement age which may be at a relatively young age. Unless measures are undertaken to increase the sources of income to the IKA, or to reduce the benefit expenditure, the financial sustainability of IKA will continue to significantly deteriorate in the future in relation to its current level.

OGA

Actuarial projections of the pension scheme for agricultural workers, OGA, are made for each of the 3 insurance branches of OGA (Basic, Additional and Main).

While OGA remains one of the largest social security schemes of Greece, it is expected that the number of active insured members will continue to decline throughout the projection period from almost 700 thousands in 2005 to about 400 thousands in 2055. This leads the scheme to an uncommon demographic and therefore financial situation.

During this period, total number of pensions and pensioners will develop differently in the difference branches. The total number of pensions paid in the basic branch will decrease from around 825 thousands in 2005 to 33 thousands in 2055. The total number of strictly Additional pensions will also decrease from nearly 290 thousands in 2005 to quasi zero in 2005. During the same period, the number of Main & Additional pensions will increase from 228 thousands to 408 thousands. In addition, the number of so-called "uninsured" pensions will grow from 66 thousands to 166 thousands. There is some uncertainty on the pensions paid to this group. If it is believed this category of pensioners will represent a substantial number of the total pensioners of OGA, and therefore of its cost, the magnitude is very difficult to predict.

Due to the previous non contributory characteristic of the Basic branch, OGA receives significant subsides from the Central budget. As this branch is phasing out, its cost is expected to decline from 1.51 to 0.31 per cent of GDP between 2005 and 2055. At the same time, the successive contributory branches of Additional and Main will mature and the expenditure increase from about 0.39 per cent of GDP to 0.81 per cent of GDP between 2005 and 2055 while income will stagnate from 0.42 per cent of GDP in 2005 to 0.29 per cent of GDP in 2055, therefore creating a deficit of around 0.52 per cent of GDP in 2055. The consolidated deficit of the three branches in 2055 would therefore be of about 0.8 per cent of GDP.

While the Basic branch is phasing out, the Main branch is maturing. With an accrual rate of 2 per cent per contributory year and reasonable indexation each year, is it not the main source of the deficit of the system.

The imbalance in the system is largely due to its demographic situation, characterized by a decreasing number of active members due to the sector of insured members covered by OGA and at the same time an important stock of pensioners.

Legal, but also effective retirement age being 65 years, it is higher than for in most of the other pension schemes of Greece and it is not believed that for such a category of insured members, it should be higher.

Nevertheless, some savings could be made by reviewing the different family additive and increments, not all being necessarily justified and some probably being very difficult and costly to administer.

Other issues

General population and macro-economic projection frame

The actuarial projections of the IKA and OGA pension schemes were performed on the basis on projections of the general population of Greece as well of the key macro-economic determinants for pension projections. For the general population projections, three key variables affect the outcome, namely the total fertility rates, the net migration population and the mortality assumptions. The assumptions used for the baseline projections in this report had to be fitted to the ones provided by the EU Ageing Working Group, at the request of the National Actuarial Authority of Greece. In the case of mortality assumptions over the 50-year projection period, the use of the EU Ageing Working Group assumptions meant a deviation from the usual ILO demographic cohort-based approach to develop mortality rates. This has meant a relatively important impact on the results, namely for the IKA scheme, as the mortality rates of the EU Ageing Working Group differ from those that the actuaries of the ILO would have recommended using. As a result, the number of deceased persons projected under the baseline projections (in line with EU Ageing Working Group) are higher than the ILO-recommended mortality projections that are 75 percent of the baseline results. Indeed, the ILO reviewed the past mortality experience under the IKA scheme and found statistical relevance in this experience that showed mortality rates are 75 per cent of what is assumed under the EU Ageing Working Group. The NAA has been informed of this situation and ILO decided to provide the results using the recommended assumption for mortality in the context of a sensitivity test.

Other macro-economic variables were projected in line with official projections.

Scheme-specific data and assumptions

As referred in the introductory section of the Executive Summary, some statistical information relevant to IKA and OGA could not be obtained with sufficient reliability but causing no significant impact on the validity of the projection results. In particular, the statistics related to the family status of insured members - providing the basis for projecting family-related benefits - were not fully available. Similarly, the projections related to the movement of insured members from one scheme to the other over the working life of a person had to follow a simplified approach given the limited data situation on those cases under the Greek pension system as a whole. The handling of inactive insured persons in terms of their future benefit entitlements was also simplified for similar reasons. Until the detailed cohort-based actuarial projections of the entire pension system of Greece are complete, it is not possible to develop an accurate and detailed reconciliation of the movements of insured persons across the different schemes. Reasonable assumptions were made to circumvent these deficiencies related to IKA and OGA.

1. General population and macro-economic projections

Future income and expenditure of IKA and OGA will be closely linked to changes in the main macro-economic and demographic variables affecting the country as a whole namely, *inter alia*, the size and age structure of the general population, employment levels, economic and wage growth, inflation and interest rates. The projection of the future finances of the different components of the national pension system and in aggregate terms requires starting from the projection of the general population of Greece and the main variables affecting national economic activity. The general population and economic projections are an intermediary step to derive actuarial projections of the different components of the national pension schemes.

General population projections provide the basis for estimating the size and composition of the labour force. Projections of gross domestic product (GDP) and workers' productivity growth indicate, in turn, how many workers, in the labour force, will be active and employed in the economy, as well as the level of their individual remuneration. Since these factors are both directly and indirectly interrelated – for example, changes in the general population directly affect the economy whilst economic performance is, in turn, having an impact on migration, changing the general population – population and economic projections are performed together to ensure key interrelations are coherent throughout the projection process.

Assumptions have been developed following an analysis of past trends and a review of plausible future experience, bearing in mind the various indications provided by the European Union Ageing Working Group to the extent they are relevant for the actuarial valuation of the Greek pension system. Where deviations are assumed, a full set of justifications is provided.

The main assumptions and projections related to general demographics and economics of Greece are discussed in the following sub-sections. Further details may be found in General population projections

The determinants of future population changes are fertility, mortality and net migration. Fertility rates determine the number of births, while mortality rates determine how many, and at what age, people are expected to die. Net migration represents the difference between the number of people who permanently enter and those who permanently leave Greece and is the most volatile of the three.

The resident population in 2003 was estimated at 11,006,000 based on the EU Ageing Working Group estimates. The present projections used this as a starting point for single age population cohorts by sex and age, with the exception that adjustments for age-specific distribution had to be made for age ninety and above. The general population was projected starting in 2004.

The total fertility rate (TFR) represents the average number of children each woman of childbearing age would have if she had all her children in a particular year. If there is no migration, a TFR of 2.1 is required, in principle, for each generation to replace itself over time. In 2003, Greece TFR was estimated at 1.29, a level substantially lower than the natural replacement TFR. The base scenario assumes that the TFR will increase until 2025 to 1.5 and will remain at that level until the end of the projection period. The assumption on the overall TRF is based on EU Ageing Working Group estimates whilst the pattern of fertility rates by single age corresponds to the medium variant projections of the United Nations.

Initial life expectancy is based on the EU Ageing Working Group estimates. For the base scenario, life expectancy at birth in 2005 was 76.8 for males and 81.8 for females. Life expectancy at an advanced age is a key driver of the cost of retirement pensions. At age 65, the remaining life expectancy was 16.8 and 20.0, respectively, for males and females in 2005.

Mortality improvements are assumed to occur in accordance with the pattern of fast increase of UN estimates.

Net migration was set at 45,000 in the year 2003 and was assumed to decline linearly to 40,000 in 2010, to 38,000 in 2020, and to 35,000 in 2030, remaining constant afterwards. This assumption was based on the EU Ageing Working Group estimates. On one hand, considerable migration movements have been observed in the recent past and are highly likely to take place in the future as well; on the other hand, the exact number of migrants depends on a set of political and economic conditions that are difficult to forecast. In such circumstances, the simplistic assumption for net migration was considered the most appropriate approach, since migratory phenomena would have to be more pronounced than those observed in the covered population until now to significantly influence the long-term financial situation of the social security system. There is an inevitable and inherent high degree of uncertainty in this assumption concerning migration.

Table 1.1 indicates the main general demographic assumptions used in this actuarial review.

Table 1.1 Main assumptions for general population projections

General population variable	Assumption	Source
Total fertility rate	Increasing from 1.29 to 1.50 until year 2025 and remaining constant at 1.50 thereafter	EU Ageing working group
Mortality improvements	Life expectancy at birth in 2005 Male: 76.8 Female: 81.8 Life expectancy at birth in 2055 Male: 82.1 Female: 87.0	Life expectancy at birth in 2005 Based on the EU- Ageing working group Life expectancy at birth in 2055 Based on the middle variant UN projections
Net migration	Declining linearly from 45,000 to 40,000 in 2010, to 38,000 in 2020, and to 35,000 in 2030 and remaining constant thereafter	EU Ageing working group

The following Chart 1.1 shows the projected general population up to year 2055 according to the three main population age groups: children, working-age and pension-age. The changes in the relative size of each age group illustrate the inevitable ageing process already experienced by the population of Greece. The number of children will decline slightly while the number of those of pension-age will increase at a much higher pace over the projection period.

Chart 1.1 Projected general population, 2005-2055 (thousands)

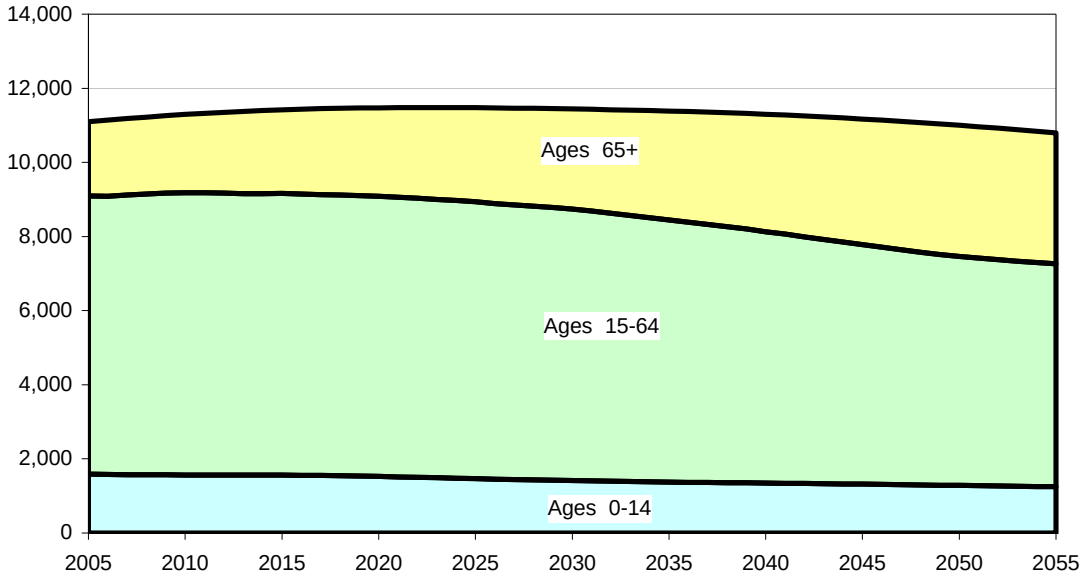


Table 1.2 shows population projections under the baseline scenario. Given that assumptions will materialize, the highlights are:

- The general population will increase to approximately 11.5 million by 2023 and then will decrease to 10.8 million by 2055.

- The total population will decrease by 3 per cent over the projection period and the number of older people in the pension-age population group of age 65 years and over will increase by 75 per cent.

- By year 2055, pension-age people of age 65 years and over will be three times more numerous than the children's population group.

- The ratio of the number of working-age people to each pension-age person will fall from 3.74 today to 1.7 by 2055. This is a trend observed in line with other countries facing a rapid ageing process.

- The projected change in the population structure will create an inevitable heavy burden on the long-term finances of the national public pension system, namely the schemes of IKA and OGA.

Table 1.2 Projected general population, 2005-2055 (thousands)

Year	Total	Age			Ratio of no. persons 15-64 to no. persons 65+
		0 – 14	15 – 64	65 and over	
2005	11,098	1,591	7,502	2,005	3.74
2006	11,142	1,581	7,506	2,055	3.65
2007	11,184	1,575	7,545	2,063	3.66
2008	11,223	1,571	7,576	2,076	3.65
2009	11,259	1,569	7,607	2,083	3.65
2010	11,293	1,566	7,618	2,109	3.61
2011	11,324	1,562	7,620	2,141	3.56
2012	11,352	1,560	7,608	2,183	3.49
2013	11,377	1,559	7,599	2,219	3.42
2014	11,399	1,561	7,597	2,242	3.39
2015	11,419	1,561	7,601	2,257	3.37
2020	11,473	1,527	7,561	2,385	3.17
2025	11,475	1,467	7,470	2,538	2.94
2030	11,441	1,412	7,325	2,704	2.71
2035	11,385	1,375	7,075	2,936	2.41
2040	11,299	1,346	6,785	3,168	2.14
2045	11,171	1,318	6,468	3,386	1.91
2050	11,000	1,284	6,180	3,536	1.75
2055	10,795	1,250	6,017	3,529	1.70

1.1. Key macro-economic variables projections

Projected changes in the population and labour force provide the capacity for additional output through more workers and increased productivity. Labour force participation by age of the male population is assumed to grow slightly at younger and older ages while decreasing for the mid-career ages. Age-specific female labour force participation rates are assumed to increase substantially for all ages in line with the EU Ageing Working Group estimations based on cohort methodology.

GDP growth is the combined result of productivity and employment variation. The nominal interest rate is the combined result of the real rate of interest of 2.9 per cent and consumer price inflation of 2.0 per cent in the reference year. Thus, the nominal interest rate is assumed at 5.0 per cent per annum.

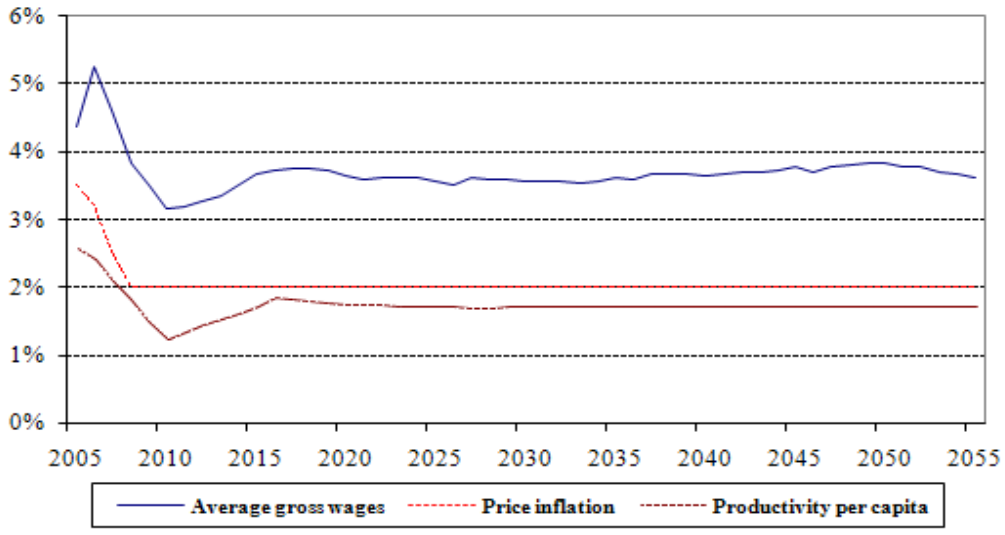
Table 1.3 shows the principal economic assumptions used in this actuarial review. Further details may be found in

Table 1.3 Main assumptions for key macro-economic variables projections

Macro-economic variable		Assumption	Source
Real GDP (annual, in millions Euro)		Increasing from 170,418 in 2005 to 314,855 in 2050	EU Ageing working group
Consumer price inflation (% p.a.)	2005 to 2007 (actual) 2008 and over	Decreasing to 2.0 % in 2008 2.0 % p.a.	EU Ageing working group
GDP deflator variation (% p.a.)	2005 to 2007 (actual) 2008 and over	Decreasing to 2.0 % in 2008 2.0 % p.a.	ILO own assumption
Real rate of return (% p.a.)		Constant at 2.9 %p.a.	ILO own assumption
Labour force participation rates		Single-age rates	EU Ageing working group

Chart 1.2 shows the pattern of the main economic assumptions over the projection period up to year 2055. This allows an appreciation of the coherence between them. The price inflation and the productivity per capita exhibit the same pattern, decreasing in the first projection years and becoming stable thereafter. According to the assumptions used, the GDP deflator is equal to consumer price inflation over the whole projection period. GDP deflator and productivity per worker are used as the components to model future wage growth levels.

Chart 1.2 Projected pattern of the main macro-economic variables, 2005-2055



2. IKA pension scheme

This section presents the actuarial projections of the IKA scheme. Workers compulsorily covered under IKA are all private sector employees, except Greeks living abroad and specific self-employed insured on a voluntary basis. With almost 2 million active contributors in 2005, IKA is the largest social security organization in Greece.

IKA provides insurance coverage to its members through various benefits such as medical care and medicament insurance. However, this actuarial valuation covers only full old-age pensions, reduced old-age pensions, disability pensions, death pensions and funeral expenses. With the exception of funeral expenses, projections focus on the long-term financial commitment of the IKA. Most pensions are payable for life and paid on the basis of 14 monthly payments.

The IKA pension system is financed by contributions from both employers and employees. The total contribution rate is 20 per cent of the gross income for most of the occupational groups. The contributions are shared between employer and employee with a ratio of 2 to 1. Arduous or unhealthy workers have a specific contribution pattern. The total contribution rate is 23.6 per cent, shared respectively at 14.4 per cent for the employers and 8.87 per cent for the employees.

Appendix II provides a detailed overview of the key coverage, contribution and benefit provisions as at December 2005.

This section deals exclusively with IKA and is divided into four sub-sections, namely the past experience review, the data and projections assumptions, the actuarial projections for the base scenario and the sensitivity tests. Unless otherwise specified, the monetary value of the projections presented in this report is in euro nominal terms.

2.1. Past experience review

This sub-section discusses the evolution of the financial situation of IKA since the last actuarial valuation that took place five years ago. The financial year of IKA is the calendar year. Therefore, the inter-valuation period covers the financial period from 31 December 2000 to 31 December 2005.

2.1.1. Highlights of demographic experience

Overall, demographic pressure has increased over the past five years. The ongoing ageing development of the IKA insured population continues progressively. As a result, a much stronger growth of the total number of pensioners than contributors is observed. The upper part of Table 2.1 shows the observed number of pensioners from 2000 to 2005.

Table 2.1 Observed number of contributors and pensioners, 2000-2005 (thousands)

	2000	2001	2002	2003	2004	2005
Observed[1]						
Contributors	1,885	1,895	1,900	1,940	1,972	1,985
Old age	489	501	506	522	535	552
Disability	140	136	137	131	131	131
Survivors	219	224	228	230	237	243
Forecasted (GAD report)						
Contributors	1,515	1,531	1,547	1,562	1,578	1,594
Old age	521	535	548	562	575	589
Disability	162	162	161	161	160	160
Survivors	225	227	230	232	235	237

The bulk of the rise in the number of pensioners comes from the old age and survivors' benefits. In fact, the number of old age pensioners has increased substantially since 2000. Over this five years period, the number of pensioners went up from 489,000 to 552,000, which corresponds to an increase of 13 per cent. The number of survivor pensioners has increased in a similar way. The observed number of disability pensions went down from 140,000 to 131,000 over five years due to high mortality among disability pensioners and low frequency in the number of new disability cases.

The lower part of Table 2.1 shows the expected number of contributors and beneficiaries from the previous actuarial valuation undertaken by the British Government Actuary's Department (GAD). Due to the availability of only five-year expected contribution and benefit amounts in the GAD report, the values in the intermediate years were obtained by linear interpolation.

For the period of 2000-2005 the number of benefit recipients was overestimated. The deviation related to the number of contributors is also of interest. Though the deviation is large in nominal terms, it is worth mentioning that the growth is very similar when comparing observed values to forecasted values. However, the definition of the notion of contributors is obviously different in the two cases and it is difficult to draw sound conclusions.

2.1.2. Highlights of financial experience

The previous actuarial valuation presented the projections of the future cash flow statement of IKA in real terms. As the ILO projections are presented in nominal terms, all financial projections of the previous actuarial valuation have been converted into nominal terms, based on the inflation assumption as described in section 1.1, in order to present comparable figures. Table 2.2 shows a comparison of the financial forecast of the GAD report with the observed values. This table does not consider minor items irrelevant to this review.

[1] Refers to the number of active contributors at the end of the financial year. This number might be different from number from Databases utilised in this valuation.

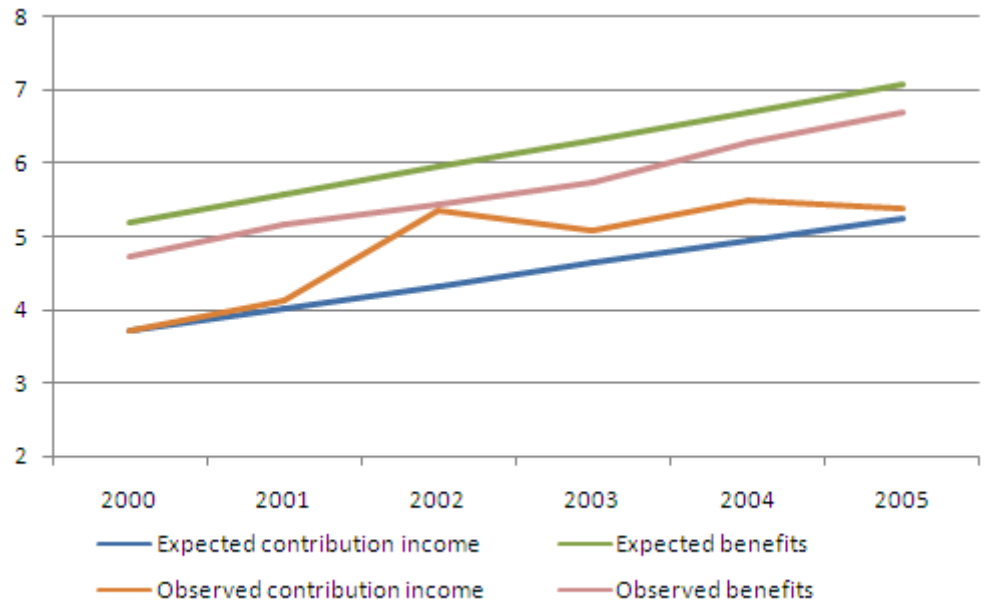
Table 2.2 Revenues and expenditures, 2000-2005 (millions)

	2000	2001	2002	2003	2004	2005
Observed[2]						
Contribution income	3,712	4,119	5,364	5,089	5,482	5,355
Investment income	19	13	41	61	107	
Benefit expenditure	4,722	5,152	5,431	5,747	6,283	6,691
Administrative expenses	34	39	38	45	55	
Forecasted (GAD report)						
Contribution income	3,709	4,019	4,328	4,638	4,947	5,257
Investment income	22	23	25	26	27	29
Benefit expenditure	5,199	5,573	5,948	6,323	6,698	7,072
Administrative expenses	85	92	99	105	112	119

From Table 2.2, it can be seen that the benefit expenditure growth for the past five years was projected reasonably accurately. However, the contribution incomes have increased more rapidly than forecasted. Therefore, it is worth mentioning that part of the deviation can be explained by a change in the accounting rules of the IKA. From 2002 onwards, contribution income refers to accrued contributions in comparison to paid contributions as was the case before 2002. This explains why the contribution income increased in 2002. Overall, the financial situation has proved to be in a more favorable situation than the expected one.

Chart 2.1 illustrates the contribution income and benefit expenditure observed in comparison to forecasted values. Miscellaneous income and expenditure are not included in the chart in order to emphasize only the crucial financial components.

Chart 2.1 Observed and expected contribution income and benefit expenditures, 2000-2005 (billions)

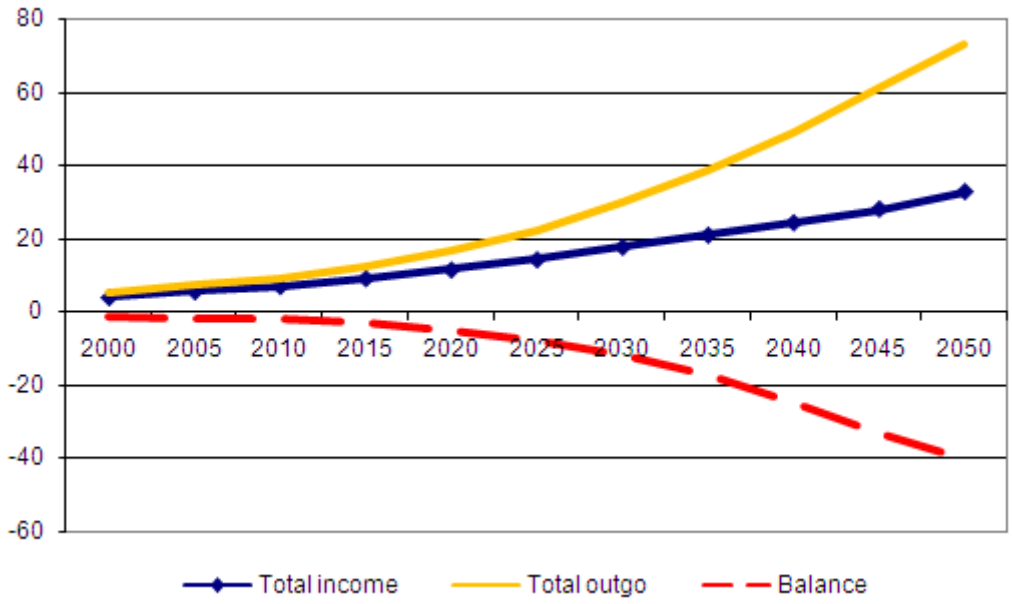


[2] Refers to the number of active contributors at the end of the financial year. This number might be different from number from Databases utilised in this valuation.

2.1.3. Long-term forecast of previous actuarial review

According to the previous actuarial review, the IKA pension scheme will have negative annual balances all over the projection period as shown in Chart 2.2.

Chart 2.2 Cash flow statement from previous actuarial review, 2000-2050 (billions)



The nominal deficit is expected to be around 40 billion euros in 2050. As illustrated in the chart, deficits are expected to remain relatively low in the first years of the projection, but are expected to grow rapidly after 2020. The underlying ageing process of the IKA insured population has been pointed out as the main explanation for the deterioration of the financial cash flow.

2.2. Data and projection assumptions

The IKA pension scheme projections require a comprehensive set of assumptions. From the national projections, some assumptions have been extended to the IKA scheme specific projections. Since IKA active contributors represent a significant part of the Greek labour force, meaningful relations can be drawn between national and IKA scheme specific variables.

2.2.1. IKA scheme specific assumptions

The salary growth of the IKA insured population is strongly correlated to the national salary growth. In addition, the IKA salary growth fluctuates according to fiscal and legal parameters such as the ceiling on contributions as described in the IKA legislation. The future evolution of the age-distribution of the insured population is also a major factor in the overall long-term IKA salary growth projections. All factors considered, the IKA salary growth is expected to grow on average by 4.0 per cent per annum over the long term, which is similar to the national salary growth estimated at around 3.7 per cent.

Based on historical information, indexation of IKA pensions has been slightly higher than inflation. Therefore, the future indexation is assumed to be equal to consumer price inflation plus 0.5 percentage points regardless of the level of pension. In the past, the indexation has

been set at different levels depending on the pension level of the pensioners. This assumption is not accepted because a flat indexation rate in the future is assumed.

The IKA insured population is not uniformly covered by a single set of rules. For instance, the active population first insured before 1993 is entitled to be covered under a different set of regulations, which is usually more generous than for the active population first insured after 1992. In addition, the legislation that applies to an insured member is based on three types of occupational activities namely: general, arduous and construction. Gender is also an important aspect, as the retirement age can be set differently for males and females. In total, the IKA insured population was divided into 12 different projection groups in order to take into account the distinctive features of all of them. The NAA provided, separately, a set of data for the 12 projection groups. Consequently, the projections can capture some of the particularities relevant to specific groups that would not have been possible by using consolidated data.

The future evolution of the insured population has been projected in order that the total insured population of IKA and OGA would grow in line with the national employed population. Given the OGA active population is assumed to decline by 1 per cent each year (see section on OGA), the IKA insured population is expected to grow slightly more rapidly than the employed population to compensate for the diminishing size of OGA.

The IKA active contributors first insured **before** 1993 is a closed group as it is not possible to enter this group based on the legislation. Thus, it is assumed that the group will gradually decline over the projection period based on mortality, disability and retirement rates. No new entrants are expected to join. Projections are based on parameters independent of the other projections.

As for the total number of IKA active contributors first insured **after** 1992, it is equal to the residual number of the expected **total** IKA contributor population minus the IKA active contributors first insured **before** 1993. Thus, we determine the number of new entrants each year for IKA active contributors first insured **after** 1992 by maintaining the equilibrium in that equation. That is, we determine the single-age insured population for each groups based on the expected total contributors deducted from the employment growth and a set of single-age assumptions, namely mortality rates, disability rates, retirement rates and new entrant's age distribution. Detailed IKA scheme specific assumptions are presented in Appendix I. Table 2.3 shows some of the main assumptions for IKA.

Table 2.3 Summary of indexation and insured population growth relevant to IKA

IKA scheme specific variables	Assumption	Source
Insurable base growth rate	Based on national projection. IKA long term salary growth estimates at around 4.0%	ILO own assumption
Indexation rate	Consumer price inflation + 0.5%-point	Current practice + ILO own assumption
Total insured population	IKA + OGA insured population grow in line with national employed population	ILO own assumption
IKA First insured **before** 1993	Decrease in line with mortality rates, retirement rates and invalidity rates. No new entrants assumed	ILO own assumption
IKA First insured **after** 1992	Residual from expected IKA insured population minus IKA insured group pre 1993	ILO own assumption

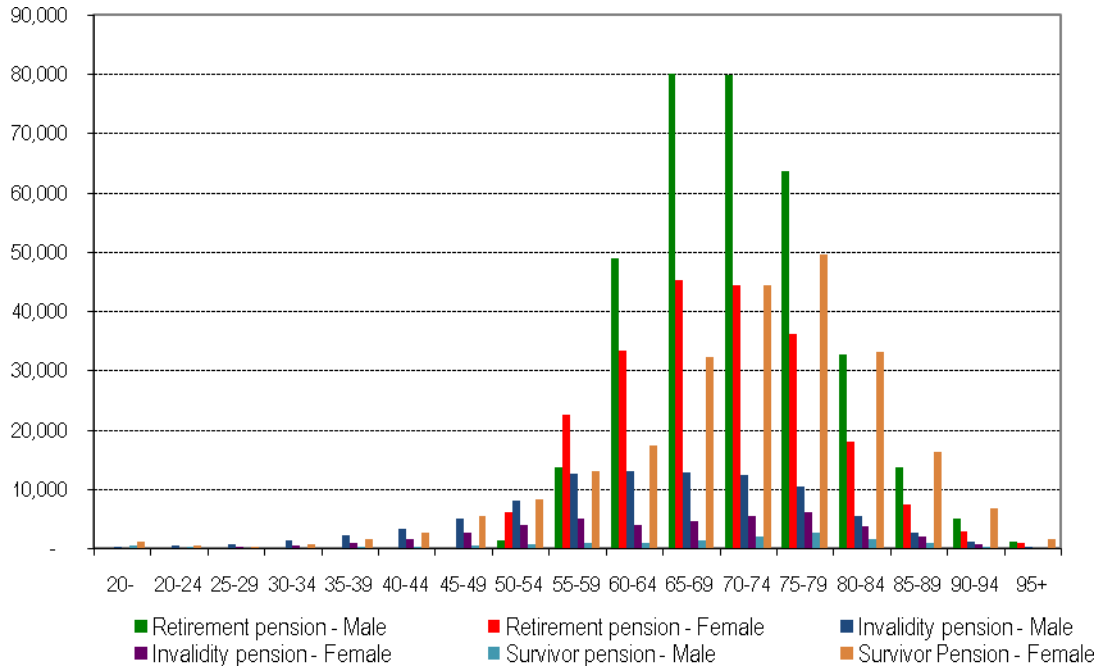
Many other relevant data and assumptions are used in the projection process such as the density of contributions, average number of years credited since registration and probability of a deceased having eligible survivors and their average ages. Relevant quantitative information is available in Appendix I.

2.2.2. IKA demographic data

Chart 2.3 shows the number of initial pensioners at valuation date. It is observed from the chart that a significant proportion of the pensioners are male retirees between 60 and 79 years old. There are more male than female retirees at most ages, except in the early retirement period, due a more permissive regulation for females.

The female survivor pensioners are the second largest pensioner population. It is observed that the bulk of the pensions are after retirement age. As females usually live longer than males, more female pensioners of old age are seen.

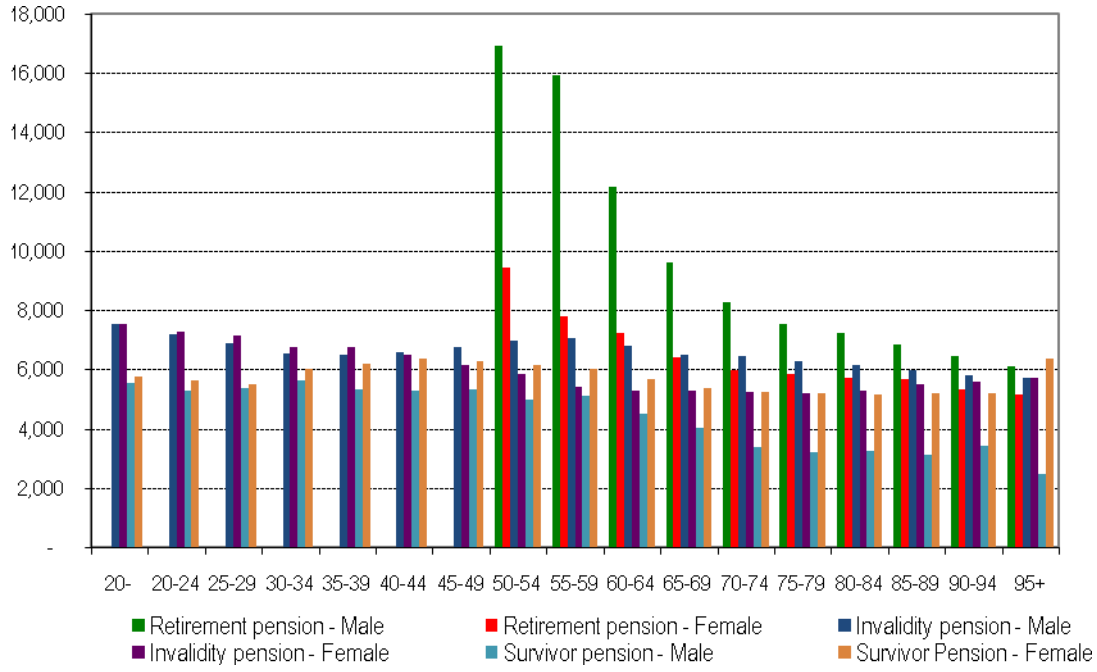
Chart 2.3 Number of pensioners as of 31 December 2005



2.2.3. IKA financial data

Chart 2.4 shows the average pensions of all types. It can be seen from this that early retirement pensioners have much higher average pensions than pensions at older ages. This could be explained by the fact that only those with many years of employment can retire before the normal retirement age and as a result, they benefit from a more generous pension. However, insured people with less years of employment have to wait until they are older in order to claim a pension. Thus, a declining trend in the average pension curve can be observed. It is also interesting to mention that female retirement pensioners have, on average, a smaller pension.

Chart 2.4 Average pension as of 31 December 2005



2.3. IKA actuarial projections for the base scenario

The actuarial projections are performed as at the valuation date of 31 December 2005. The valuation period is 50 years, ending in 2055. This section presents and analyses projections of IKA for the years 2006 to 2055. The purpose of these projections is to identify long-term trends on the revenue and expenditure sides, limited to contributions and benefits, and to assess the main drivers of the financial viability of the IKA system. As previously mentioned, actuarial projections are based on the projection of the general population and the main macro-economic variables as presented in Section 1, as well as on an extensive series of IKA-specific assumptions derived from an in-depth past performance review to adjust the initial database and to derive assumptions on the most likely future course. Projections assumed the financing and benefit provisions governing the IKA scheme, as of 31 December 2005, will remain unchanged in the future.

2.3.1 IKA demographic projections

Table 2.4 shows the projected demographic development under the IKA baseline projection assumptions. The ratio of the number of active contributors to every pensioner in 2055 will be less than half of what it was in 2005, i.e. decreasing from 2.51 contributors per pensioner in 2005 to 0.99 contributors per pensioner in 2055. This appears to reflect not only the general ageing process, but also the impact of the possibility for active people to retire relatively early as their life expectancies increase.

Table 2.4 IKA demographic projections, 2005-2055

Year	Number of contributors*	Number of pensions			Total number of pensioners	Ratio of contributors to pensioners
		Old-age	Invalidity	Survivors		
2005	2,355,971	557,715	134,571	247,580	939,866	2.51
2006	2,396,397	560,465	136,458	249,467	946,390	2.53
2007	2,439,391	563,418	138,415	251,281	953,114	2.56
2008	2,477,484	566,332	140,549	252,969	959,850	2.58
2009	2,526,158	569,449	142,880	254,648	966,977	2.61
2010	2,568,920	573,016	145,458	256,325	974,799	2.64
2011	2,607,274	577,246	148,353	258,001	983,600	2.65
2012	2,641,528	582,282	151,535	259,671	993,488	2.66
2013	2,673,430	588,139	154,998	261,448	1,004,585	2.66
2014	2,704,649	594,829	158,729	263,186	1,016,744	2.66
2015	2,735,202	602,411	162,700	264,743	1,029,854	2.66
2025	2,764,517	732,489	216,544	275,969	1,225,002	2.26
2035	2,711,890	850,293	252,162	279,137	1,381,592	1.96
2045	2,384,050	1,354,034	348,945	331,004	2,033,983	1.17
2055	2,254,391	1,499,121	366,389	407,316	2,272,826	0.99

* Number of insured persons who contributed at least once during the year.

2.3.2 IKA financial projections

Table 2.5 below shows the financial projections for IKA in terms of total expenditure by benefit category and total insurable earnings. It is interesting to note that total benefits as percentage of insurable earnings will increase from 26.1 in 2005 to 59.3 in 2055.

Table 2.5 IKA benefit expenditure projections by benefit category, 2005-2055 (millions)

Year	Old-age	Invalidity	Survivors'	Total	Benefits (% of insurable earnings)	Benefits (% of GDP)
2005	4,534	842	1,316	6,692	26.1	3.79
2006	4,809	896	1,389	7,094	26.0	3.78
2007	5,106	954	1,465	7,525	25.8	3.80
2008	5,347	1,002	1,522	7,871	25.5	3.79
2009	5,605	1,054	1,581	8,240	25.1	3.79
2010	5,882	1,110	1,644	8,636	25.0	3.81
2011	6,181	1,172	1,709	9,062	24.9	3.84
2012	6,507	1,238	1,777	9,522	24.8	3.88
2013	6,860	1,310	1,848	10,018	24.8	3.91
2014	7,241	1,388	1,924	10,553	24.8	3.95
2015	7,654	1,472	2,002	11,128	24.8	3.99
2025	14,021	2,740	2,985	19,746	28.4	4.98
2035	27,204	5,194	4,540	36,938	37.7	6.95
2045	50,902	8,863	7,344	67,109	53.4	9.62
2055	77,366	12,892	11,926	102,184	59.3	10.86

The overall financial projections of the IKA are summarized in Table 2.6 below. They are limited to revenue from contributions, assuming the present contribution rate remains in force, the benefit expenditure is assumed to unfold based on the present benefit provisions and assumptions derived from the past performance review of the scheme.

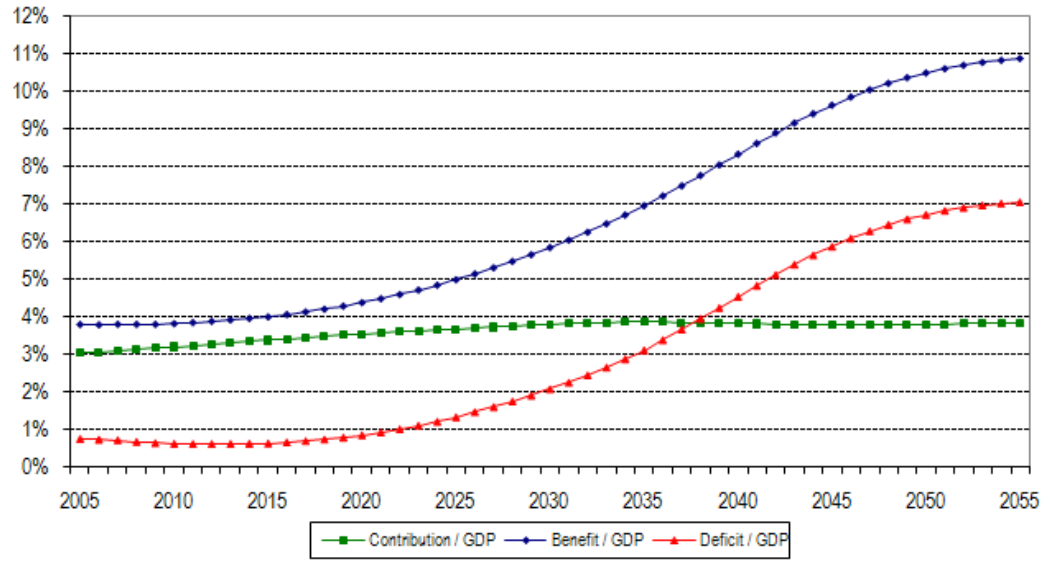
Table 2.6 IKA financial projections summary, 2005-2055 (millions)

Year	Revenue from contribution (A)	Benefit Expenditure (B)	Annual deficit (A)-(B)	Annual deficit (% of GDP)
2005	5,380	6,691	-1,311	0.74
2006	5,730	7,094	-1,364	0.73
2007	6,109	7,524	-1,415	0.71
2008	6,479	7,871	-1,392	0.67
2009	6,860	8,240	-1,380	0.64
2010	7,230	8,636	-1,406	0.62
2011	7,618	9,062	-1,444	0.61
2012	8,023	9,522	-1,499	0.61
2013	8,445	10,019	-1,574	0.61
2014	8,896	10,554	-1,658	0.62
2015	9,380	11,128	-1,748	0.63
2025	14,499	19,745	-5,246	1.32
2035	20,457	36,940	-16,483	3.10
2045	26,275	67,108	-40,833	5.85
2055	36,001	102,184	-66,183	7.03

Chart 2.5 shows the expected evolution of long-term contribution income, benefit expenditure and the resulting net annual deficit expressed as a percentage of nominal GDP. It is worth mentioning that the investment income, administration expenses and other financial cash flows are not considered in the projection.

It is expected that the deficit will be fairly stable for the next 15 years partly due to the relatively young age of the existing IKA insured population. However, the deficit will increase steadily from 2020 up to 2050, therefore; it is expected to be around 7 per cent of GDP at the end of the projection period.

Chart 2.5 IKA financial projections: contribution revenue, benefit expenditure and resulting net annual deficits, 2005-2055 (% of GDP)



The resulting projected financial performance of IKA may be summarized by two main financial indicators:

- The general average premium (GAP), the average uniform contribution rate required over the projection period from end-of-year 2005 to 2055 to fully cover the projected total benefit expenditure over that period. The GAP may also be calculated by dividing the present value of benefit expenditure by the present value of insurable earnings over the projection period.

- The pay-as-you-go cost rate in a given reference year (PAYG), the actual cost of the benefit expenditure for that year of reference in terms of the insurable earnings for that same reference year.

It is noted here that the cost of administration is not included in the calculation of the GAP and PAYG benefit cost rates.

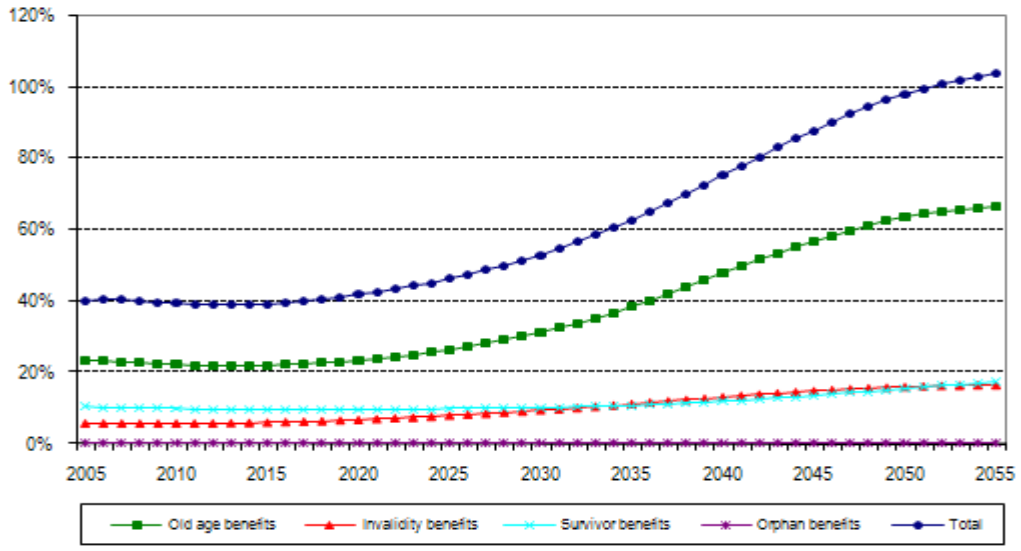
The PAYG cost rate is, in turn, calculated as the product of two ratios driving its future development:

- the system demographic ratio given by the number of beneficiaries divided by the number of active contributors, as shown in Chart 2.6; and

- the system replacement ratio given by the average benefit divided by the average insurable earnings, as shown in Chart 2.7

The system demographic ratio is expected to increase dramatically from 2020 onwards. At the end of the projection, the ratio would be slightly over 100 per cent, meaning that there would be more pensioners than contributors. This situation has severe financial implications for IKA. In 2005, there were more than two contributors for each pensioner but the pension system will have less than one contributor per pensioner in 2055. The ageing demographic shift in the composition of the IKA insured population is the main driving force in the future evolution of the financial situation.

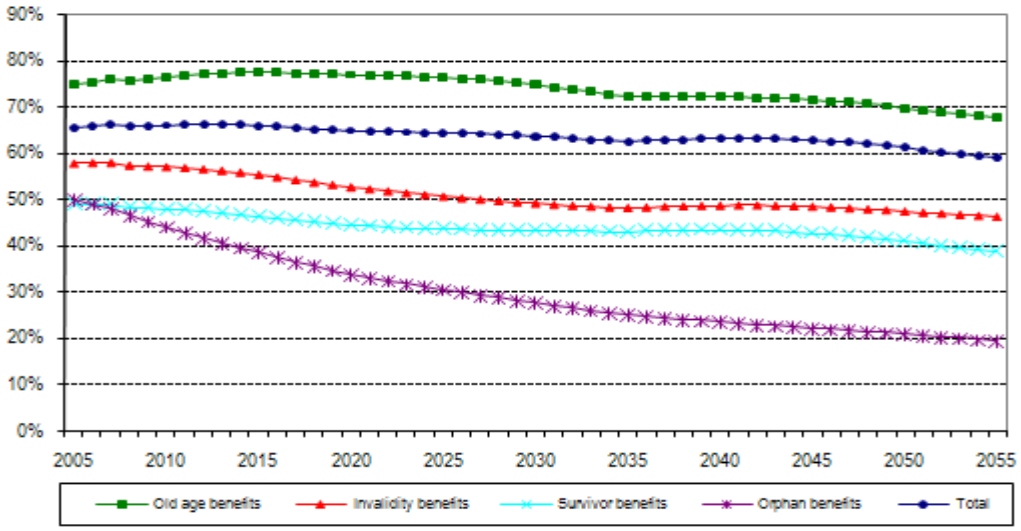
Chart 2.6 IKA Projected system demographic ratio, 2005-2055



Note: demographic ratio = number of pensions divided by number of contributors

The total system replacement ratio is expected to remain relatively stable over the next 50 years although it can be observed from Chart 2.7 that the average replacement ratio would be gradually declining over the projection period. This can be explained by the fact that the indexation (around 2.5 per cent) is smaller than the expected salary growth (around 4.0 per cent). Thus, average salaries would progressively become larger than average pensions. The gap is somehow remaining in the same range despite a relatively big difference between indexation and salary growth because the new generation of pensioners will receive a pension based on higher pensionable salaries.

Chart 2.7 IKA Projected system replacement ratio, 2005-2055



Note: replacement ratio = average pension divided average insurable earnings

Chart 2.8 shows the resulting impact on the PAYG cost rate. It is clearly observed that the IKA projected cost rate as a percentage of the insurable earnings largely exceeds the current contribution rate. In 2055, the projected cost rate is almost three times the contribution rate, mainly due to the steady increase of old age benefits. In fact, old age benefits are expected to be twice the existing level at the end of the projection period.

Invalidity, survivor and orphan benefits would also increase significantly in the future. Although of less financial importance in comparison to old age benefits, they would increase, nevertheless, the financial pressure on the pension scheme.

Chart 2.8 IKA projected Pay-as-you-go cost rate, 2005-2055 (% of insurable earnings)

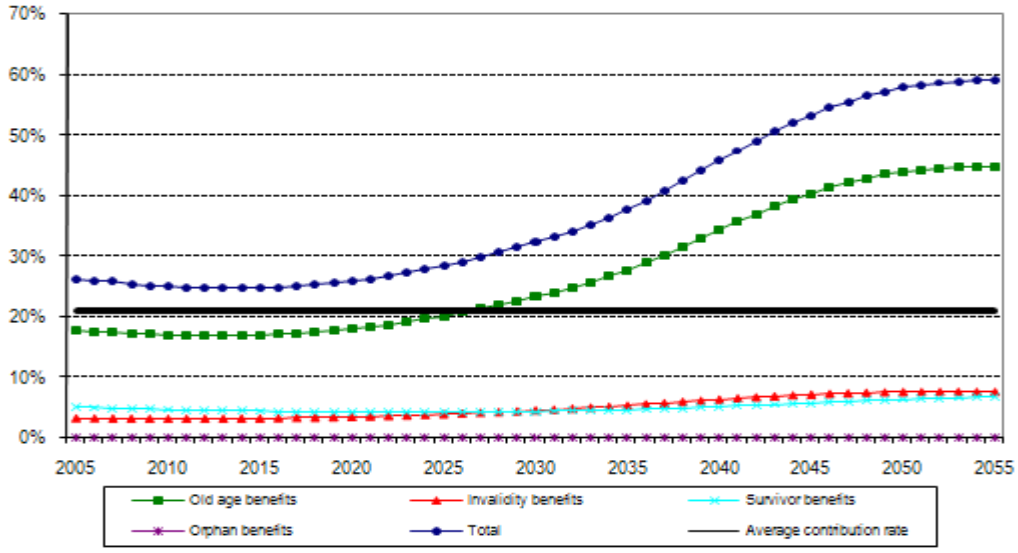


Table 2.7 shows a summary of the GAP and PAYG at specific points in time.

Table 2.7 IKA projected benefit cost rates, 2005, 2030 and 2055 (% of insurable earnings)

	Reference	% of insurable earnings
Present average contribution rate	2005	21.0
General average premium	2005-55	35.3
Pay-as-you-go cost rate	2005	26.1
Pay-as-you-go cost rate	2030	32.4
Pay-as-you-go cost rate	2055	59.3

Note: The above benefit cost rates do not take into account administration expenditure.

The PAYG cost rate in 2005 was of 26.1 per cent of insurable earnings, i.e. more than 5.1 percentage points higher than the average collected contribution rate in 2005 (ranging between 20 and 23 per cent of insurable earnings according to the different insured classes). The GAP is projected at 35.3 per cent of insurable earnings for the period from end-of-year 2005 to 2055. This is also significantly higher than the present legal contribution rates, varying between 20 and 23 per cent of insurable earnings. Unless measures are undertaken to increase the sources of income to the IKA, or to reduce the benefit expenditure, the financial sustainability of IKA will continue to significantly deteriorate in the future.

2.4. Projections under sensitivity tests for IKA

Long-term actuarial projections include an extensive set of demographic, economic and scheme-specific assumptions. Actual experience will inevitably differ from the projections. This section analyses sensitivity tests of various key parameters.

2.4.1. Sensitivity test on mortality

Mortality assumptions are undeniably a crucial factor in the demographic projection as they drive the ageing development of the IKA insured. By assuming different mortality rates than the base scenario, the number of contributors, and more importantly the number of pensioners in the future, would generate different financial results. In order to present a wide range of possibilities, the actuarial projections of IKA were forecasted under sensitivity tests with mortality rates adjusted downwards to 75 per cent of the base scenario level and another one with mortality rates adjusted upwards to 125 per cent of the base scenario level. Table 2.8 shows the financial impact of the sensibility tests.

Table 2.8 Impact of sensitivity test with different demographic assumptions, 2005-2055

Scenario	General Average Premium (% of insurable earnings)	PAYG (% of insurable earnings)			Deficit (% GDP)		
		2005	2030	2055	2005	2030	2055
Base	**35.3**	**26.1**	**32.3**	**59.3**	**0.7**	**2.1**	**7.0**
Lower Mortality rates	37.1	26.1	34.0	63.3	0.7	2.4	7.8
Higher Mortality rates	33.8	26.1	30.9	55.8	0.7	1.8	6.4

Lower mortality rates would increase the financial burden on the pension scheme. The GAP would increase by 1.8 percentage points and aggravate the deficit percentage in terms of GDP by 0.8 percentage points in 2055. This sensitivity test might be considered as being realistic as the historical mortality rates recorded have been slightly better than the general population.

However, the higher mortality rates scenario would result in an enhanced financial position for IKA. The deficit as of percentage of GDP would be 0.6 percentage points lower than the base scenario in 2055. Nevertheless, it is not a realistic scenario.

2.4.2. Sensitivity test on indexation basis

Over the past years, the government has adopted the annual pension indexation rates on an *ad hoc* basis. In recent years, most of the time, the indexation rates have been slightly higher than inflation. Therefore, the indexation rate for the base scenario has been established at an inflation level plus 0.5 per cent for the base scenario (2.5 per cent in the long term). Given the uncertainty of the indexation process in the future, two sensitivity tests were performed. One consists of a future indexation as of 2008 equal to inflation (2 per cent in the long term) and one consists of a future indexation based on national wage growth (around 3.7 per cent in the long term). Table 2.9 shows the main results for the variation of indexation rates.

Table 2.9 Impact of sensitivity test with variation of indexation basis, 2005-2055

Scenario	General Average Premium (% of insurable earnings)	PAYG (% of insurable earnings)			Deficit (% GDP)		
		2005	2030	2055	2005	2030	2055
Base	**35.3**	**26.1**	**32.3**	**59.3**	**0.7**	**2.1**	**7.0**
Lower Indexation (inflation)	33.0	26.1	30.3	52.5	0.7	1.7	5.8
Higher Indexation (wage)	41.3	26.1	37.5	77.9	0.7	3.0	10.4

The impact of the variation of indexation rates is substantial. The lower indexation scenario, which is defined as a decrease of 0.5 per cent of the indexation rate, would reduce the PAYG rate in 2055 from 59.3 for the base scenario to 52.5 per cent. In addition, the annual deficit of IKA in relation to the national GDP would be 1.2 percentage points below the base scenario. No parameters of the actuarial projection are as sensitive as indexation. Minor differences in the indexation assumptions result in major financial changes. For instance, if the indexation is expected to match the national wage growth level, the cost of the pension scheme would be much higher. That is, the deficit could be as high as 10.4 per cent of GDP in 2055.

2.4.3. Sensitivity test on density of contribution

The density of contribution can be defined as the annual number of employment days divided by 300, which is equivalent to a full year of employment. The future evolution of density influences the financial results in two different ways. First, it directly influences the contribution income during the active life of the contributors. Second, it influences the accumulated accrued pension rights that would be awarded at retirement age, in case of invalidity and for survivor benefits.

The sensitivity tests presented in this report assume a change in the future density of contributions. The lower density scenario forecasts a gradual decline of the density factors over 30 years. In 2035, all density factors would be 90 per cent of the 2005 level. The higher density scenario is built in a similar way. In this case, the density of contributions would be at 110 per cent of the 2005 level. Table 2.10 shows the main financial indicators resulting from the sensitivity tests related to density.

Table 2.10 Impact of sensitivity test with variation of future density of contribution, 2005-2055

Scenario	General Average Premium (% of insurable earnings)	PAYG (% of insurable earnings)			Deficit (% GDP)		
		2005	2030	2055	2005	2030	2055
Base	**35.3**	**26.1**	**32.3**	**59.3**	**0.7**	**2.1**	**7.0**
Lower Density	37.4	26.1	35.1	63.7	0.7	2.4	7.1
Higher Density	33.9	26.1	30.5	56.5	0.7	1.8	7.0

In the lower density scenario, the PAYG rate is substantially higher than the base scenario. This is due to the fact that less contribution income is available for the payments to existing and future pensioners. The deficit as a percentage of GDP is very similar to the base scenario because the accrued rights for future benefits are less important. Overall, the scale of income and expenditure is smaller, as less money is coming into the pension scheme system.

In the higher density scenario, the PAYG is 2.8 percentage points less important in 2055 when compared to the base scenario and the required contribution rate needed to maintain the pension scheme in equilibrium from 2005 to 2055 is smaller by 1.4 percentage points. However, the deficit/GDP ratio in 2055 is very similar to the base case scenario. That is, the pension system is cheaper in relation to the insurable base but maintains a very high cost in nominal terms.

2.4.4. Sensitivity test on initial past credit

The last sensitivity test is related to the initial past credit. The notion of past credit could be defined as the distribution of the number of past years of contribution accumulated by the active contributors at the valuation date. As IKA is a component of a larger pension system in Greece, the number of accrued employment years under other pension schemes was not readily available. Therefore, an adjustment had to be made to the initial data provided by the

NAA to better reflect the financial cost of the new pensioners. Due to the uncertainty of this variable, two different sensitivity tests were performed. One of them considers the initial past credit to be at 90 per cent of the base scenario and the other considers the initial number of years of contribution to be at 110 per cent of the base scenario. Table 2.11 shows the main financial indicators for these sensitivity tests.

Table 2.11 Impact of sensitivity test with variation of initial past credit, 2005-2055

Scenario	General Average Premium (% of insurable earnings)	PAYG (% of insurable earnings)			Deficit (% GDP)		
		2005	2030	2055	2005	2030	2055
Base	**35.3**	**26.1**	**32.3**	**59.3**	**0.7**	**2.1**	**7.0**
Lower initial past credit	34.7	26.1	31.5	58.7	0.7	1.9	6.9
Higher initial past credit	36.0	26.1	33.1	59.8	0.7	2.2	7.1

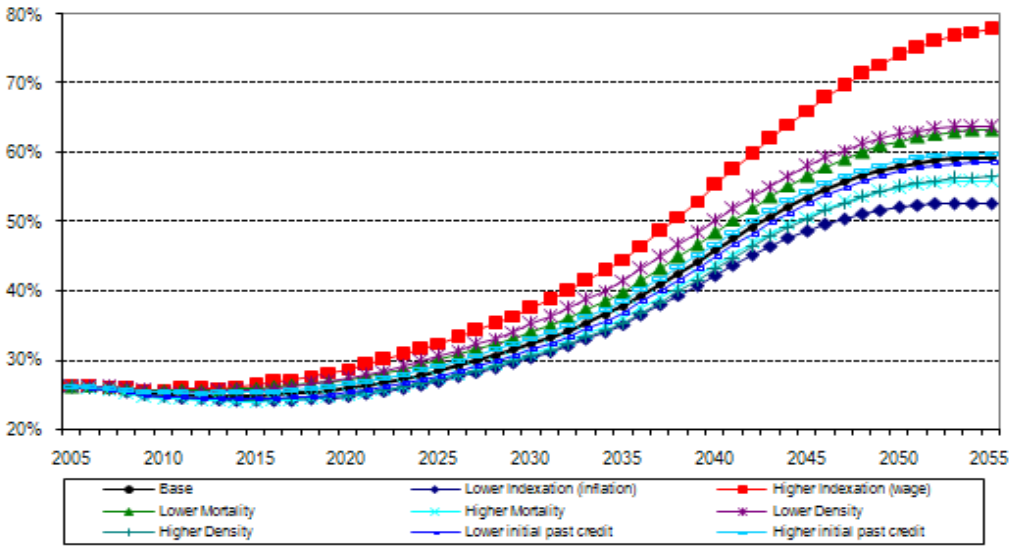
As Table 2.11 shows, the impact is not as important as for the other sensitivity tests. One reason is that the change of the initial past credit only affects the financial results for a limited number of years. The number of initial past credit only influences the existing contributors and has limited impact in the very long term.

Nevertheless, the figures illustrate that higher initial past credit would result in larger pensions, increasing at the same time the financial burden on the pension scheme. The order of magnitude is around 0.5 percentage points for the mentioned sensitivity tests.

2.4.5. Summary of the sensitivity tests

Chart 2.9 shows the IKA projected cost rates as a percentage of insurable earnings for the sensitivity tests performed earlier. It can be observed that the more sensitive variable is the indexation rate. Lower density, lower mortality and higher initial past credit scenarios cause an increase of the cost. The results of the opposite tests produce lower cost rates.

Chart 2.9 IKA projected cost rate of the sensitivity tests, 2005-2055 (% of insurable earnings)



3. Actuarial projections - OGA

This section presents the actuarial projections of the pension scheme for agricultural workers, OGA. With still nearly 700 thousands active members in 2005, OGA is one of the largest social security schemes of Greece.

OGA provides insurance coverage to its members through various benefits such as medical care and medication insurance. This actuarial valuation covers pensions for old-age, disability and survivors and funeral grants. The projections are made for each of the 3 insurance branches of OGA referred as the Basic, Additional and Main insurance branches. The Additional and Main insurances branches are presented as one consolidated branch referred to Main & Additional. The projections take account of the fact that most OGA pensions are payable for life and paid on the basis of 14 monthly payments.

The actuarial projections are performed as of the valuation date of 31 December 2005. The valuation period is of 50 years, i.e. ending in year 2055. Projections assumed the financing and benefit provisions governing the OGA scheme as of 31 December 2005 remain unchanged in future according to a status quo basis.

The main purpose of these projections relevant to OGA only is to identify long-term trends of the contribution revenue and benefit expenditure and to assess the main cost drivers affecting the financial viability of the OGA system. As previously mentioned, actuarial projections are based on the projection of the general population and the main macro-economic variables as presented in section 1. OGA-specific assumptions necessary for the purpose of the projections are presented in sub-section 3.1. They refer to development of the key characteristics of insured members as well as behavioral assumptions affecting benefits.

Sections 3.2 to 3.3 refer to the Basic benefit branch and to the Main & Additional benefit branches of OGA respectively.

The OGA pension system is composed of three different insurance branches that reflect the history of the scheme. The Basic branch is a non contributory system that, although still awarding new pensions, is phasing out. The Additional branch served as a transition between the Basic branch and the Main branch. It functioned as a defined benefit contributory system. For insured members who retire after 1998, contributions made under the Additional branch are recognized in the Main branch. The Main pension branch, which started in 1998, is also a defined benefit system financed by contributions from workers, employers and the State, each contributing one third of the contribution rate of 21 per cent of insurable base. In addition to these three branches, non contributory pensions continue to be awarded and paid to the so-called group of “uninsured” persons, i.e. persons who have not accrued enough rights in the different pension schemes of Greece to receive a pension based on their own service credits and therefore are entitled to this pension as their only from of income replacement benefit. An overview of the key coverage, contribution and benefit provisions of OGA as of December 2005 is found in Appendix II.

Section 3 is divided into five sub-sections, the data and projection assumptions, the actuarial projections of the OGA Basic benefit branch for the base scenario, the actuarial projections of the OGA Main & Additional consolidated benefit branches for the base scenario, the total OGA deficit and finally the sensitivity tests. For OGA, no review of experience was undertaken as detailed financial and actuarial data were not available for the totality of the period under review (2000-2005) and also because the scope of the previous valuation was different from the current one (projections were not presented separately for each branch).

3.1. Data and projection assumptions

The projections require a comprehensive set of data and assumptions. This section presents valuation data of OGA as of 2005, as well as scheme-specific assumptions. Table AI. 14 to Table AI. 23 in Appendix I show the detailed statistical data on OGA.

3.1.1. OGA active insured members

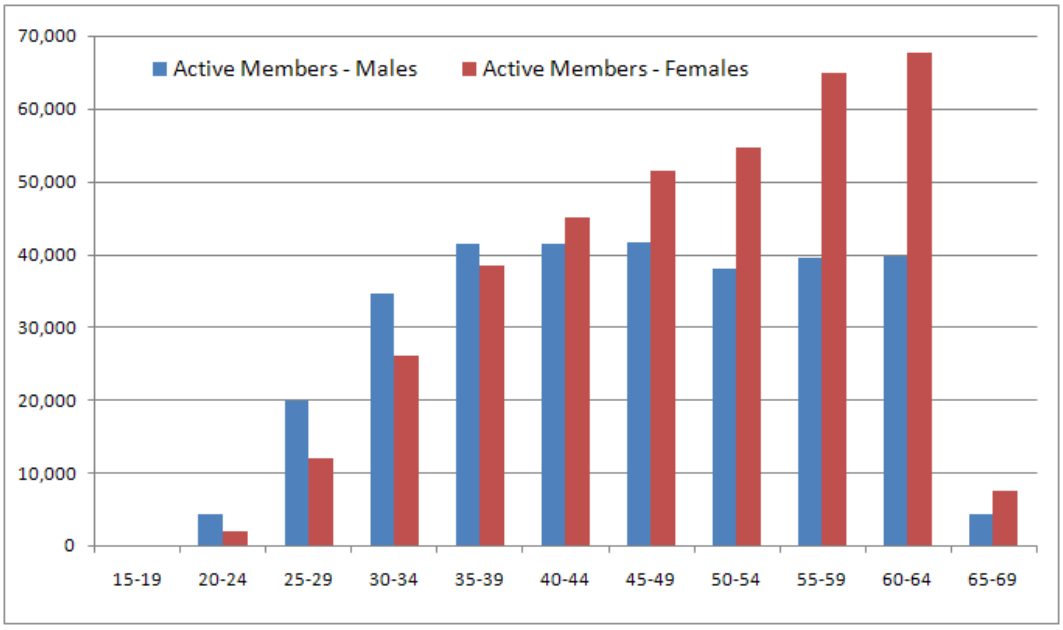
There were in 2005 approximately 675 thousands active OGA insured members contributing, 55 per cent of which being women. The average age was of 48 years, 49 for women and 46 for men, and 47 per cent of the active insured members are more than 50 years old. Chart 3.1 depicts the age and sex distribution.

The average contributory base per insured member is difficult to assess as the scheme offers the possibility to each insured member to select the insurance category in which she or he wants to contribute. The resulting average annual "insurable base" has been calculated by assuming the insurance category reflects the earnings and amounts to approximately 5,200 euros in 2005, with no noticeable difference between men and women. It is interesting to observe the trend amongst those of age 50 and onwards, amongst whom a significant number move to a higher insurance category with the effect of improving the expecting pension level, despite a pension formula referring to the full career. This pattern seems to happen too late to really improve the pension. No assumption regarding this type of behavior is taken into account.

As there are fewer and fewer workers in the agricultural sector, there are fewer and fewer OGA active insured members. For the purpose of this valuation, a simplified exogenous assumption had to be made such that the number of OGA active members will decrease by one per cent each year[3]. This simplified assumption is consistent with the observed decrease over the last 7-8 years and leads to a reasonable overall number of agricultural workers in the labour force at the end of the projection period.

[3] Until the reconciliation of the insured population of all the public pension schemes is made, it is not possible to refine the evolution of employment forecasts bys economic sector and occupational groups. A sensitivity test should be presented when all public pension schemes of Greece will be incorporated in the valuation.

Chart 3.1 Number and age and Sex distribution of OGA active members as of 31st of December 2005



The boundaries defining the insurance categories for contribution purposes are calculated and indexed yearly based on the public employee pension indexing of the previous year. It has been assumed that insurance categories will grow in line with the projected average salary growth rate.

The indexation of OGA pensions is based on a decree on annual policy income and has resulted in adjustments higher than the consumer price inflation in the past. Therefore, as for IKA, the future indexation is assumed to be equal to the annual change in consumer price inflation plus 0.5 percentage-points. Table 3.1 summarizes the assumptions on indexation and growth of the insured population under OGA.

Table 3.1 Summary of indexation and insured population growth relevant to OGA

	Assumption	Source
Insurable base growth rate	Based on public employee pension indexing policy	Current practice + ILO own assumption
Benefit indexation rate	Consumer price inflation + 0.5%-point	Current practice + ILO own assumption
Number of active members	Decrease of 1% per annum	ILO own assumption

Numerous other relevant assumptions have been developed in the projection process, such as the density of contributions, the number of years credited since registration and the probability of a deceased having eligible survivors. Relevant quantitative information is available in Appendix I.

3.1.2. OGA pensions and pensioners

The analysis of the numbers of OGA pensions requires prudent distinction between the number of pensions and the number of pensioners. An OGA pensioner can receive more than one pension. As shown in Table 3.2, in 2005, 700 thousands old-age pensioners were receiving more than 1.1 million pensions. Out of these, 675 thousands were Basic old-age pensions, 262 thousands were Additional old-age pensions and 198 thousands were Main old-

age pensions. For disability, as shown in Table 3.1, about 150 thousands pensioners were receiving about 195 thousands disability pensions. Out of these, 146 thousands were Basic disability pensions, 26 thousands were Additional disability pensions and 23 thousands were Main disability pensions. In 2005, women received 64 per cent of old-age pensions and 57 per cent of disability pensions paid.

In addition, about 71 thousands "uninsured" old-age pensions were paid in 2005. The evolution of the number and characteristics of this group is very difficult to anticipate in view of the inherent uncertainty and the lack of information on the potential group who claim this pension[4]. The projection assumes that all OGA active insured members who do not qualify for a Basic pension, or for a Main pension as of 2027, will automatically receive a "uninsured" pension. In addition, it is assumed that a constant percentage of the total population of Greece reaching 65 years old will be awarded each year an uninsured pension. This percentage has been set at 3.0 per cent for men and 4.5 per cent for women to fit the recent experience.

Average yearly pensions stand from 650 euros for Additional old-age pensions to 3,500 euros for Basic disability pensions. The average level of Additional pensions is relatively low due to the fact that the branch has existed only for 10 years. For Basic and Additional pensions, there is no significant difference in the average pension for women and men while for Main pensions, men receive slightly higher pensions than women do. This difference is explained by the fact that they receive more frequently a spouse additive payment. Table 3.2 and 3.3 present the number and average amount of the different categories of pensions.

Table 3.2 Number and average amount of OGA old-age pensions, 2005

	Males		Females		Total	
	Number	Average (euros p.a.)	Number	Average (euros p.a.)	Number	Average (euros p.a.)
Basic	242,241	2,848	432,701	2,932	674,942	2,902
Additional	96,210	660	165,787	642	261,997	648
Main	70,527	2,470	128,288	2,110	198,815	2,238
Uninsured	24,764	2,980	46,424	2,980	71,188	2,980

Table 3.3 Number and average amount of OGA disability pensions, 2005

	Males		Females		Total	
	Number	Average (euros p.a.)	Number	Average (euros p.a.)	Number	Average (euros p.a.)
Basic	62,022	3,653	84,019	3,501	146,041	3,566
Additional	10,946	714	15,291	680	26,237	694
Main	10,663	2,424	12,611	2,105	23,274	2,251

The age distribution of pensioners is in line with the history of the OGA scheme. For instance, Additional pensions were accrued, and therefore awarded, between 1989 and 1998, such that the group of Additional pensioners in 2005 was aged between 72 and 81 as the former reached the retirement age of 65 in 1998, and the latter in 1989. Main pensions replaced Additional

[4] This will likely be possible at an ulterior stage when a full reconciliation of the insured population under all public pension schemes will be available.

pensions so that the older pensioners retired in 1999 at the age of 65 so that in 2005 they are 71 years-old[5].

As of 31 December 2005, more than 95 per cent of Main and Additional pensioners also received a Basic pension. At the same time, about 300 thousands pensioners were receiving only a Basic pension, more than half of which were pensioners who were awarded their pension before 1988 when only the Basic branch existed. The remainder of Basic pensioners refers to persons who did not meet eligibility conditions for Additional and Main pensions.

For the actives insured members who will become beneficiaries, it is assumed all will retire at the normal retirement age of 65 throughout the projection period.

3.1.3. Family and other increments

Different pensions or different additional payment referred as "increment" to the pensions are paid to different categories of pensioners in function of their family situation. They are also different for each of the three insurance branches. The projections take all of these into account to the extent the available data permitted to correctly assess them. Detailed tables on the family increments are presented in Appendix I. These statistics were used to the extent possible to calculate the future numbers of survivors' pensions. There are different additional payments in function of the degree of disability. The data made available did not permit to model these separately from the total disability pensions.

3.2. Projections of OGA Basic benefit branch

The demographic and financial projections are summarized in Tables 3.4 and 3.5 respectively.

As assumed, the number of active insured members decreases by one per cent every year. As of 2027, no new pension will be awarded under the Basic branch as new Basic old-age pensions will only be awarded until 2026 (with an annually increasing reducing factor applied to the amount of pension). The number of Basic pensions decreases as a result throughout the projection period at a moderate rate until 2026 and then more rapidly. At the end of the projection period, only a marginal number of Basic old-age pensions is projected as the youngest of the pensioners whose pensions would be awarded in 2026 at the age of 65 would be 94 years old by 2055. The same development happens for Basic disability pensioners although the extinction of this group lasts longer as these pensions are awarded at younger ages and can thus be paid for a potentially longer period than Basic old-age pensions.

It is expected that an increasing number of OGA Basic pensions will be paid to the so-called "uninsured" group, i.e. persons who have no other old-age pension entitlement under any of the Greek pension schemes and who are eligible under OGA to claim a pension under the "uninsured" status. In 2055, it is projected that more than 165 thousands uninsured pensions will be in payment compared to 71 thousands in 2005. This represents more than a two-fold increase in relation to a decreasing overall number of OGA active insured members[6].

[5] See Table AI 16 to AI 19 for a global pictures of age distribution of pensions.

[6] The reader is reminded of the uncertainty in defining the assumption for the uninsured group as previously explained.

Table 3.4 OGA Basic benefit branch demographic projections, 2005-2055

Year	Active Insured Members	Number of pensions				Total	Funeral grants
		Old-age	Invalidity	Survivors	Uninsured old-age		
2005	674,842	674,942	146,041	4,000	71,188	896,171	N/A
2006	668,094	658,069	144,721	4,451	72,566	879,807	42,654
2007	661,413	641,656	143,326	4,883	72,899	862,764	41,606
2008	654,799	625,836	141,875	5,233	73,575	846,519	40,757
2009	648,251	611,104	140,382	5,486	74,469	831,441	40,131
2010	641,768	597,527	138,833	5,605	76,108	818,073	39,454
2011	635,350	584,710	137,236	5,632	78,283	805,861	39,060
2012	628,997	571,344	135,565	5,586	81,012	793,507	38,596
2013	622,707	555,853	133,853	5,431	84,061	779,198	38,256
2014	616,480	539,841	132,127	5,268	87,037	764,273	37,897
2015	610,315	524,398	130,385	5,100	89,851	749,734	37,653
2025	551,958	391,898	114,445	2,947	115,381	624,671	31,233
2035	N/A	202,248	76,272	1,444	138,826	418,790	20,128
2045	N/A	75,917	43,729	1,169	158,125	278,940	12,792
2055	N/A	12,428	19,962	828	166,155	199,373	5,333

In nominal terms, the total expenditure of the Basic branch only marginally evolves to remain fairly stable until year 2055. The decreasing total amounts of the Basic old-age and Basic disability pensions are counter-balanced by the increasing expenditure of uninsured pensions as these uninsured pensions represent more than 90 per cent of the total Basic branch expenditure in 2055 in comparison to 8 per cent in 2005. This projection trend is in line with the situation of the Basic branch and the growing number of elderly in the general population.

In relative terms, in percentage of GDP, the total expenditure of the Basic branch decreases from 1.51 per cent of GDP in 2005 to 0.31 per cent of GDP in 2055.

Table 3.5 OGA Basic benefit branch financial projections, 2005-2055 (millions)

	Old-age	Invalidity	Survivors'	Uninsured	Funeral Grant	Total	Total (% of GDP)
2005	1,912	534	13	212	-	2,671	1.51
2006	1,962	532	14	224	31	2,763	1.47
2007	1,960	540	16	234	31	2,781	1.40
2008	1,956	549	18	246	31	2,800	1.35
2009	1,952	556	19	259	31	2,817	1.30
2010	1,948	563	20	276	31	2,838	1.25
2011	1,942	568	20	296	31	2,857	1.21
2012	1,930	573	21	320	32	2,876	1.17
2013	1,908	577	20	346	32	2,883	1.13
2014	1,881	580	20	373	33	2,887	1.08
2015	1,850	582	20	401	33	2,886	1.04
2025	1,305	547	13	748	37	2,650	0.67
2035	609	424	7	1,255	36	2,331	0.44
2045	190	288	7	1,922	41	2,448	0.35
2055	21	160	7	2,680	50	2,918	0.31

3.3. Projections of OGA consolidated Main & Additional benefit branches

The Main & Additional benefit branches are consolidated for financing reporting purposes. Broadly speaking, insured members who have accrued rights under both of the Additional and Main branches will see all their benefit rights recognized under the Main branch.

For this report, the Additional branch is thus referred to in a narrow sense as it only represents a closed group of pensioners, i.e. pensioners who were awarded an Additional pension between 1989 and 1998 and who will continue to receive it until they die[7]. As a consequence, the number of Additional pensions is projected to decrease quickly such that in 30 years, there would remain only very few pensions under that branch as shown in Table 3.6. The amount of the Additional branch pensions is relatively small as that system existed only for 10 years.

The number of Main pensions in payment is projected to increase during the projection period to 2030 as the system provisions are maturing. The first pensions awarded under that branch date from 1998. During the projection period from 2030 to 2055, the total number of pensions is projected to decrease as the newly awarded old-age pensions decrease each year due to the decrease in the total number of insured members and do not counter-balance the number of pensioners who dye. In total, the number of pensions, as shown in Table 3.7, represents a significant number compared to the number of active insured members and the ratio of the former to the later deteriorates all over the projection period.

Table 3.6 OGA Additional branch projected numbers of pensions, 2005-2055

Year	Old-age	Invalidity	Survivors	Total
2005	261,997	26,237	1,270	289,504
2006	251,846	25,696	1,336	278,879
2007	241,061	25,144	1,407	267,612
2008	229,652	24,573	1,464	255,690
2009	217,646	23,982	1,503	243,131
2010	205,094	23,366	1,515	229,975
2011	192,055	22,723	1,509	216,286
2012	178,608	22,049	1,486	202,143
2013	164,853	21,343	1,478	187,673
2014	150,907	20,605	1,463	172,975
2015	136,848	19,830	1,445	158,123
2025	24,279	10,876	673	35,828
2035	4	3,985	302	4,291
2045	0	1,323	265	1,588
2055	0	341	206	547

[7] The projections assume that the number of OGA insured members is negligible for those who have made contributions between 1989 and 1998 and who did not make any contribution to the Main branch since that date and who did not retire yet. Those insured members would be entitled to a benefit only under the Additional branch.

Table 3.7 OGA Main branch projected numbers of active insured members and pensions, 2005-2055

Year	Active Insured members	Number of pensioners				Ratio contributors : pensioners
		Old-age	Invalidity	Survivors	Total	
2005	674,842	198,815	23,274	5,699	227,788	2.96
2006	668,094	215,878	26,561	7,040	249,479	2.68
2007	661,413	231,653	29,763	8,474	269,890	2.45
2008	654,799	246,436	32,905	9,964	289,305	2.26
2009	648,251	260,901	35,986	11,485	308,372	2.10
2010	641,768	275,115	38,992	13,010	327,117	1.96
2011	635,350	289,081	41,905	14,528	345,514	1.84
2012	628,997	301,152	44,706	16,025	361,883	1.74
2013	622,707	310,249	47,401	17,527	375,177	1.66
2014	616,480	317,771	50,016	18,995	386,782	1.59
2015	610,315	324,967	52,559	20,435	397,961	1.53
2025	551,958	349,133	73,023	32,545	454,701	1.21
2035	499,181	334,785	82,236	38,036	455,057	1.10
2045	451,450	322,629	81,654	37,033	441,316	1.02
2055	408,284	296,406	77,216	34,458	408,080	1.00

Table 3.8 presents the projected expenditure by type of benefits under the consolidated Main & Additional branches. Benefit expenditure is projected to increase sharply during the first half of the projection period to 2030 as new pensioners will progressively accrue a higher potential number of years of contributory service. During the second half of the projection period to 2055 the level of pension expenditure stabilizes as the number of beneficiaries decreases, as previously explained. The total benefit expenditure in percentage of GDP reaches a peak around 2045 at about 0.84 per cent of GDP, against 0.39 per cent in 2005. In terms of revenue from contributions, the general trend is slowly declining in line with demographic projections. Contribution income is projected to amount to 0.29 per cent of GDP in 2055, against 0.42 per cent in 2005, as shown on Table 3.9.

Table 3.8 OGA Main & Additional branches projected benefit expenditure, 2005-2055 (millions)

	Old-age	Invalidity	Survivors'	Total	Total (% insurable base)
2005	600	85	6	691	19.5
2006	680	81	10	771	20.9
2007	744	92	12	848	22.2
2008	806	102	14	922	23.5
2009	869	114	16	999	24.8
2010	933	125	19	1,077	26.2
2011	1,001	137	21	1,159	27.6
2012	1,067	150	24	1,241	28.9
2013	1,128	163	27	1,318	30.0
2014	1,186	177	30	1,393	31.0
2015	1,248	191	34	1,473	31.9
2025	1,991	369	78	2,438	40.8
2035	3,251	598	142	3,991	52.0
2045	4,832	833	216	5,881	59.0
2055	6,274	1,100	295	7,669	59.0

Table 3.9 OGA Main & Additional branches projected revenue, expenditure and annual deficit, 2005-2055 (millions)

Year	Revenue from Contributions		Expenditure (Benefits)		Annual deficit	Annual deficit (% of GDP)
	Nominal	% of GDP	Nominal	% of GDP		
2005	748	0.42	691	0.39	58	N/A
2006	781	0.42	771	0.41	10	N/A
2007	802	0.40	848	0.43	-45	0.02
2008	824	0.40	922	0.44	-98	0.05
2009	845	0.39	999	0.46	-154	0.07
2010	863	0.38	1,077	0.48	-215	0.09
2011	881	0.37	1,159	0.49	-279	0.12
2012	901	0.37	1,241	0.51	-341	0.14
2013	922	0.36	1,318	0.51	-397	0.15
2014	944	0.35	1,393	0.52	-449	0.17
2015	969	0.35	1,473	0.53	-504	0.18
2025	1,256	0.32	2,438	0.61	-1,182	0.30
2035	1,612	0.30	3,991	0.75	-2,380	0.45
2045	2,092	0.30	5,881	0.84	-3,790	0.54
2055	2,732	0.29	7,669	0.81	-4,938	0.52

The general average premium (GAP) is defined as the average uniform contribution rate required over the projection period (2006 to 2055) to cover total benefit expenditure over that same period[8]. It is estimated at 41.5 per cent of the insurable base. The Pay-as-you-go (PAYG) cost rate is the contribution rate theoretically required to have sufficient annual contribution income to pay for the annual benefit expenditure. It is projected to increase from 19.5 per cent to 59.0 per cent of insurable base from 2005 to 2055.

Table 3.10 OGA Main & Additional branch key actuarial indicators for the projection period, 2005-2055

Indicator	Reference period	% of insurable base
Present average contribution rate	2005	21.0
General average premium	2005-55	41.0
Pay-as-you-go benefit cost rate	2005	19.5
Pay-as-you-go benefit cost rate	2025	40.8
Pay-as-you-go benefit cost rate	2055	59.0

It is important to analyze components of the PAYG cost rate: the demographic and the system replacement ratios. The demographic ratio (or dependency ratio) is obtained by dividing the number of pensions by the number of active insured members. The system

[8] The GAP is calculated by making the ratio of the present value of total expenditure (benefits and administration) over the present value of the insurable base.

replacement ratio is the average consolidated[9] pension over the average insurable base. The PAYG is the product of those two ratios.

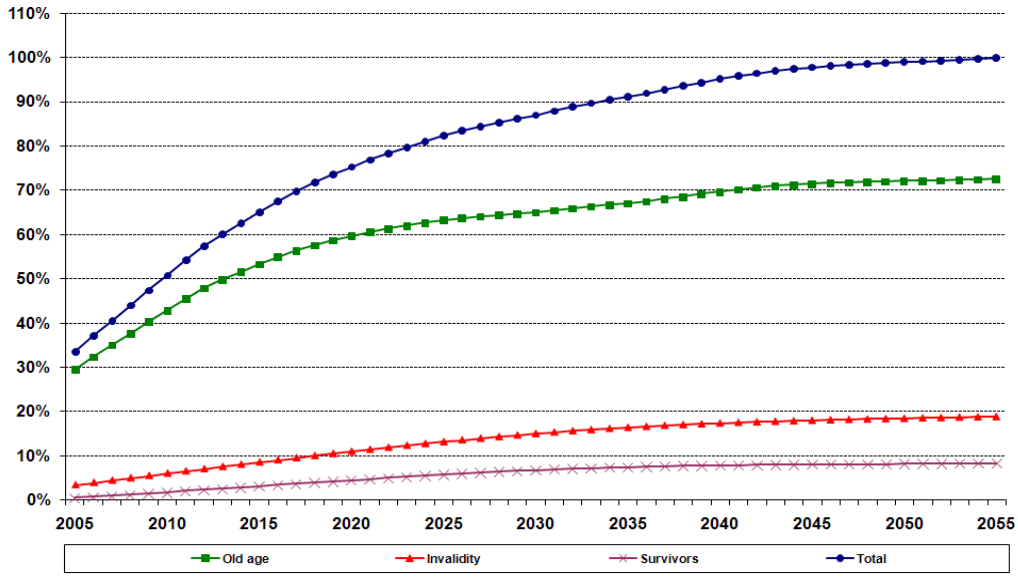
The demographic ratio of OGA must be analyzed bearing in mind two key factors :

- The maturity of the scheme with an underlying ageing population as it is projected to see a growing number of pensioners and a decreasing number of active insured members.

- The complexity of relatively different sets of provisions of the Basic, Main and Additional benefit branches with significant differences in terms of their status as a branch.

As a result, the analysis over time must focus on the consolidation of branches and not solely on the predominant Main branch. It is observed that many of the previous OGA contributors receive a pension from the Additional and Basic branches and non from the Main pension branch. Chart 3.2 presents the demographic ratios of the Main branch and Chart 3.3 presents the demographic ratios after the incorporation in the numerator of Additional pensions[10]. The ageing and maturing process experienced under OGA clearly appears as the demographic ratio is projected to increase to a level above 100 per cent at the end of the projection, implying there will be more than one pensioner for every active insured member.

Chart 3.2 OGA Main branch projected system demographic ratio, 2005-2055

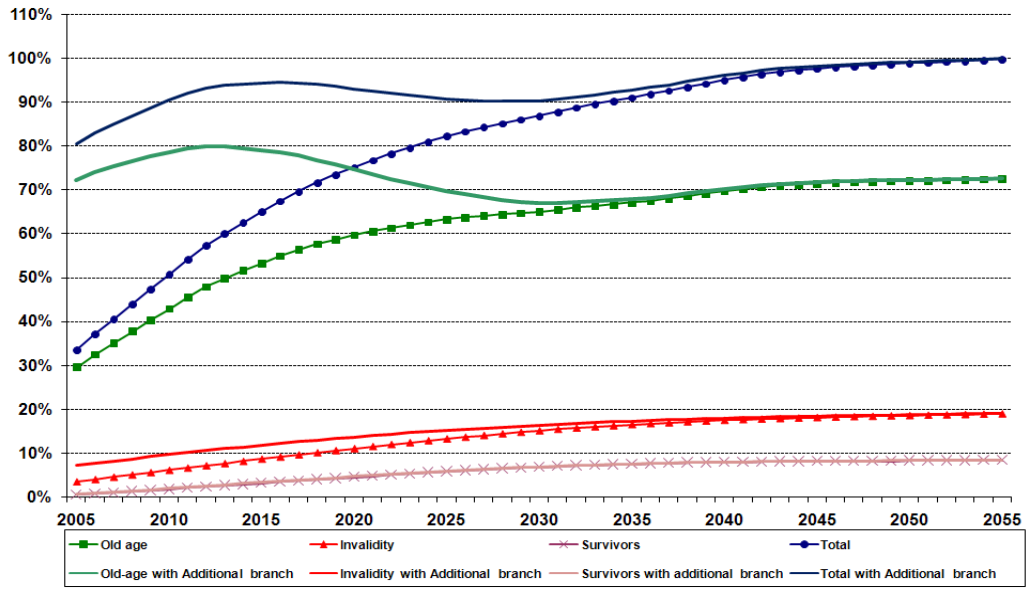


Note: demographic ratio = number of pensions divided by number of active insured members

[9] Consolidated pensions refer to the inclusion of both Main & additional

[10] The picture remains incomplete as some formers contributors to OGA who only receive a Basic pension are not included here.

Chart 3.3 OGA Main & Additional branches projected system demographic ratio, 2005-2055



Note: demographic ratio = number of pensions divided by number of active insured members

The system replacement ratio measures for a given year the average level of pensions provided by the system in relation to the average insurable base. In the case of OGA, the interpretation of the development of this indicator is difficult to measure as many pensioners receive 2 pensions (see section 3.1.2).

Chart 3.4 presents the evolution of the system replacement ratio for the Main branch. The analysis of the development of the system replacement ratio is not obvious as many elements interfere:

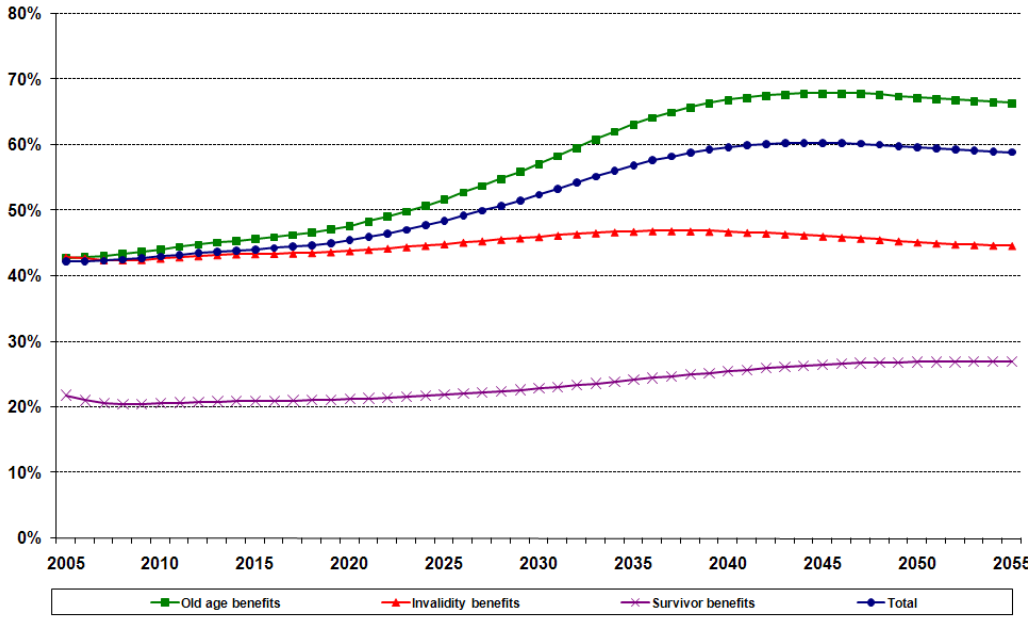
- The potentiality for insured members to accrued years of credit is linked to the maturity of the system. In the case of OGA, current pensions beneficiaries could not accrue a full career of credits as the contributory system was established in 1988.

- The benefit formula differs under the Additional and the Main branches.

- The current average level of pensions reflects how pensions were indexed in the past. As a result, the system replacement ratio increases slowly at the beginning of the projection period from a level of 40 per cent of insurable base and increase at a more rapid pace thereafter until it reaches a stable level close to 60 per cent of insurable base around year 2040.

One concludes that the projected system replacement ratio will be sustainable as it presents a reasonable level ultimately. This indicates that the benefits formula provides a system replacement rate above the recommended minimum income replacement under the international labor organization convention n° 102 on minimum requirement for a social security scheme.

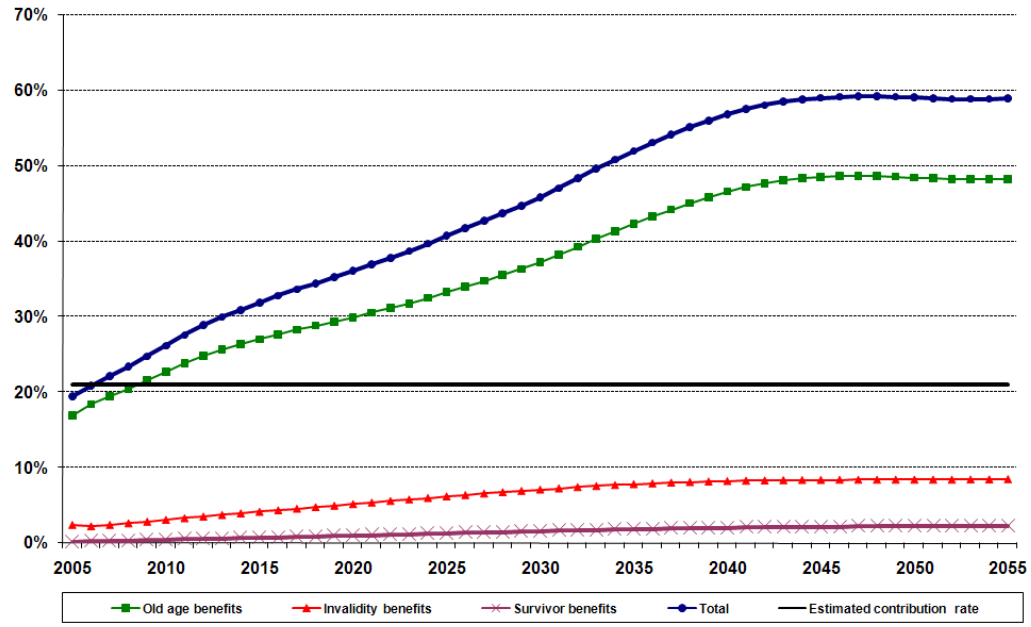
Chart 3.4 OGA Main branch system replacement ratio, 2005-2055



Note: replacement ratio = average insurable base divided by average pension

Finally, the yearly PAYG benefit cost rates for the different benefits categories is shown on Chart 3.5. The total pay-as-you-go cost rate for all benefit categories becomes higher than the current average contribution rate of 21 per cent of insurable base as of the third year of projection. The two branches are thus projected to be in deficit as early as in 2007. The situation is projected to deteriorate until around year 2040 to increase to nearly 60 per cent of the insurable base by then and remaining stable afterwards.

Chart 3.5 OGA Main & Additional branches Pay-as-you-go, 2005-2055 (% of insurable base)

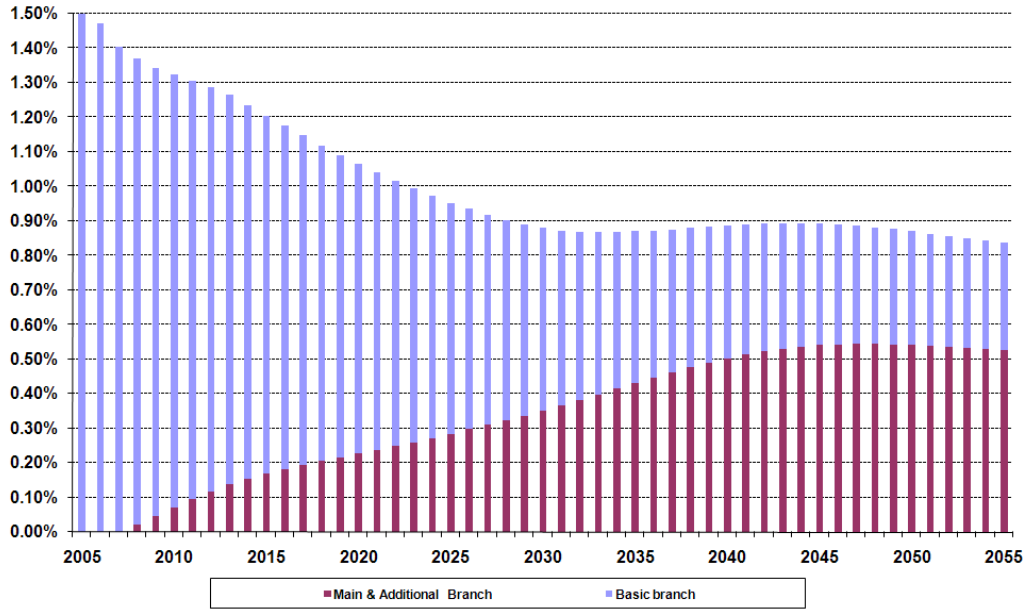


3.4. Projected consolidated financial situation under the OGA scheme

Chart 3.6 presents the projected total deficit in percentage of GDP of the Basic, Main and Additional branches. As expected, pensions under the mature Basic branch are the main benefits expenditure until 2025-2030 and then remain at a relatively constant level thereafter that is becoming a smaller proportion of the total expenditure over the projected period. This leads to a relatively stable level of the consolidated deficit after 2030 to 2055.

After a steady decline during the first half of the projection due to the decline of the deficit of the Basic branch, the deficit stabilizes around 0.9 per cent of GDP as the increase in the deficit for the maturing Main & Additional branches compensates the decrease of the Basic branch.

Chart 3.6 OGA projected net annual deficit, 2005-2055 (% of GDP)



3.5. Projections under sensitivity tests for OGA

Due to the inherent uncertainties surrounding some of the projection assumptions used for OGA, sensitivity test allow an assessment of the potential effect of changes in the assumptions under the status quo base projection. Indeed, long term actuarial projections include an extensive set of demographic, economic and scheme-specific assumptions. Actual experience will inevitably differ from the projections. Three sensitivity tests are presented in reference to the lower mortality and two different indexation basis.

3.5.1. Sensitivity test on mortality

The mortality experience observed under OGA over recent years prior to the valuation date indicate that the OGA insured population faces a mortality better than the general population. The ILO projection under the base case did not take into account that the mortality experience of OGA is better than the assumption taken in the base scenario in the view of EU Ageing Working Group requirements. This sensitivity test reflects mortality patterns more closely aligned to the actual mortality experience of OGA.. Table 3.11 shows the financial impact of the sensibility test.

Table 3.11 Impact of demographic assumptions, 2005-2055

Scenario	System	General Average Premium (% of insurable base)	PAYG (% of insurable base)			Deficit (% of GDP)		
			2005	2030	2055	2005	2030	2055
Base	Basic	47.1	75.5	36.1	22.4	1.51	0.53	0.31
	Main & Additional	41.0	19.5	45.9	59.0	N/A	0.37	0.52
	Total OGA					1.51	0.89	0.83
Lower mortality projection	Basic	51.6	75.5	41.5	24.6	1.51	0.61	0.34
	Main & Additional	43.9	19.5	49.8	64.6	N/A	0.42	0.60
	Total OGA					1.51	1.03	0.94

Lower mortality rates indicate that the cost of the system will be higher as pensions would be paid on average for a longer period. The deficit in percentage of GDP would be about 0.1 percentage-points higher in 2055 at 0.94 per cent of GDP.

3.5.2. Sensitivity test on indexation basis

Annual indexation of OGA pensions over the past years has been systematic higher than consumer price. The base projections assume pensions-in-payment are indexed at a rate equal to consumer price inflation plus 0.5 percentage-points. Given the uncertainty and high impact of this assumption on the financial situation of OGA, two sensitivity tests have been performed: assuming future pension indexation as of 2008 will be lower at a level equal to consumer price and assuming higher pension indexation by using national wage growth. Table 3.12 and 3.13 present the results under the different indexation assumptions.

Table 3.12 Impact of sensitivity test with lower indexation basis, 2005-2055

Scenario	System	General Average Premium (% of insurable base)	PAYG (% of insurable base)			Deficit (% of GDP)		
			2005	2030	2055	2005	2030	2055
Base	Basic	47.1	75.5	36.1	22.4	1.51	0.53	0.31
	Main & Additional	41.0	19.5	45.9	59.0	N/A	0.37	0.52
	Total OGA					1.51	0.89	0.83
Indexation At CPI	Basic	45.3	75.5	33.6	20.9	1.51	0.49	0.29
	Main & Additional	39.3	19.5	43.7	55.3	N/A	0.33	0.47
	Total OGA					1.51	0.83	0.76

Table 3.13 Impact of sensitivity test with higher indexation basis, 2005-2055

Scenario	System	General Average Premium (% of insurable base)	PAYG (% of insurable base)			Deficit (% of GDP)		
			2005	2030	2055	2005	2030	2055
Base	Basic	47.1	75.5	36.1	22.4	1.51	0.53	0.31
	Main & Additional	41.0	19.5	45.9	59.0	N/A	0.37	0.52
	Total OGA					1.51	0.89	0.83
Indexation on salary	Basic	51.5	75.5	42.3	26.8	1.51	0.62	0.37
	Main & Additional	45.3	19.5	51.2	69.1	N/A	0.44	0.67
	Total OGA					1.51	1.06	1.04

It resulted that the impact of different assumptions for indexation basis is substantial. The lower indexation scenario would reduce the PAYG cost rate of the Main & Additional branches in 2055 from 59 per cent of insurable base under the base scenario projections to 55.3 per cent in year 2055. The total annual deficit of OGA in percentage of GDP would decrease from 0.83 per cent to 0.76 per cent. On the contrary, under the higher indexation scenario (indexation on salary), the cost would be substantially higher and the PAYG cost rate of the Main & Additional branches would increase by 10 percentage-points to 69.1 per cent in 2055. In relation to GDP, the total deficit of OGA would increase to more than one per cent of GDP.

3.5.3. Summary of the sensitivity tests

Chart 3.7 presents the OGA projected PAYG cost rates as a percentage of insurable base for the sensitivity tests presented earlier for the Main & Additional branches and Chart 3.8 presents the total deficit of OGA in percentage of GDP.

Chart 3.7 OGA Main & Additional branches projected pay-as-you-go cost rate under the different sensitivity tests, 2005-2055 (% of insurable base)

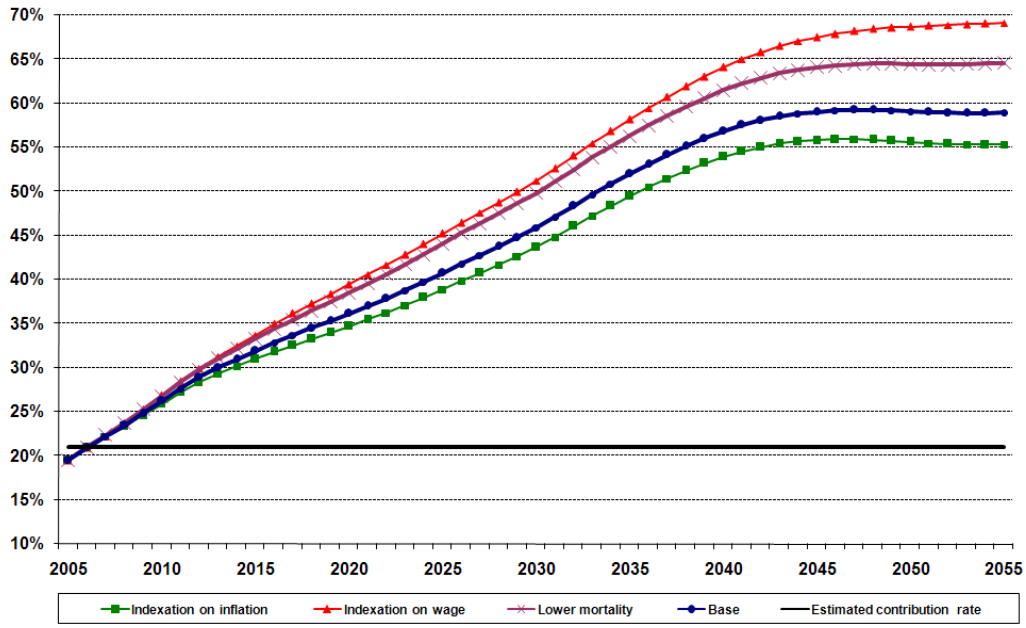
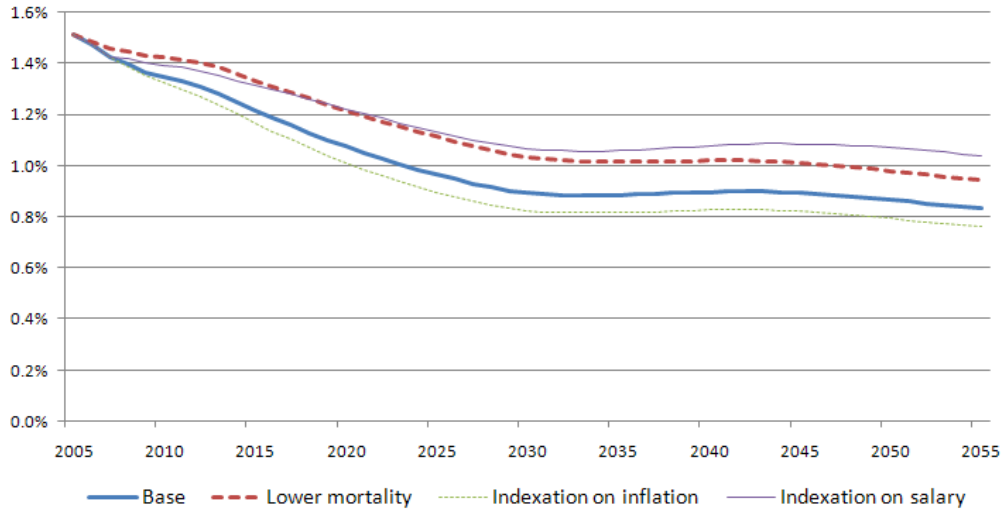


Chart 3.8 Total OGA projected deficit under the different sensitivity, 2005-2055 (% of GDP)



Appendix I Methodology, initial data and assumptions

I.1 Demographic and economic assumptions

This actuarial review makes use of the comprehensive methodology developed by the International Financial and Actuarial Service of the ILO (ILO FACTS) for reviewing the long-term actuarial and financial status of a national pension scheme. The review has been undertaken by modifying the generic version of the ILO modelling tools to fit the specific case of IKA. These modeling tools include a population model, an economic model, a labour force model, a wage model, a model of old-age, disability and survivor benefits model and an employment injury benefits model.

The actuarial valuation begins with a projection of Greece's future demographic and economic environment. Next, projection factors specifically related to the IKA are determined and used in combination with the demographic/economic framework to estimate future cash flows and reserves. Assumption selection takes into account both recent experience and future expectations, with emphasis placed on long-term trends rather than giving undue weight to recent experience.

I.2 Modelling the demographic and economic developments

The general Greek population has been projected beginning with census data in 2003 and by applying appropriate mortality, fertility and migration assumptions. The total fertility rate (TFR) was estimated at 1.29 in 2003 and it is assumed that it will increase rapidly to 1.5 in 2025 remaining constant thereafter. The pattern of fertility rates by age corresponds to the medium variant projections of the United Nations.

Mortality rates have been established according to the United Nations' medium variant. Consistency checks have been performed to ensure they reproduce, with a reasonable degree of accuracy, the number of deaths in the population and among the pensioners of IKA. Mortality rates of the population base are provided in Table AI. 1.

Table AI. 1 Mortality rates, 2005-2055

	Male		Female	
Age	2005	2055	2005	2055
20	0.0008	0.0002	0.0003	0.0001
25	0.0010	0.0003	0.0004	0.0001
30	0.0009	0.0003	0.0004	0.0002
35	0.0010	0.0004	0.0006	0.0002
40	0.0015	0.0007	0.0009	0.0005
45	0.0023	0.0015	0.0014	0.0008
50	0.0041	0.0022	0.0022	0.0011
55	0.0061	0.0040	0.0032	0.0017
60	0.0095	0.0061	0.0049	0.0027
65	0.0151	0.0093	0.0076	0.0045
70	0.0239	0.0153	0.0130	0.0078
75	0.0428	0.0255	0.0248	0.0148
80	0.0747	0.0441	0.0488	0.0267
85	0.1230	0.0734	0.0904	0.0472
90	0.1920	0.1281	0.1554	0.0854
95	0.2806	0.2147	0.2438	0.1668

Table AI. 2 shows life expectancies at certain ages.

Table AI. 2 Life expectancies

	Males			Females		
Life expectancy at:	2005	2030	2055	2005	2030	2055
Birth	76.8	79.7	82.1	81.8	84.8	87.0
Age 60	20.7	22.8	24.6	24.4	26.7	28.6
Age 65	16.8	18.7	20.4	20.0	22.1	24.0

Net migration was set at 45,000 in the year 2003 and assumed to decline linearly to 40,000 in 2010, to 38,000 in 2020, and to 35,000 in 2030, remaining constant thereafter.

The projection of the labour force, i.e. the number of people available for work, is obtained by applying assumed labour force participation rates to the projected number of people in the total population. The total participation rate for ages 15 to 64 years changes over time, due to the variation in the age composition of the population. Table AI. 3 shows the age-specific labour force participation rate for selected ages.

Table AI. 3 Age-specific and total labour force participation rates (active persons as % of total population)

Age	Males		Females	
	2005	2055	2005	2055
17	12%	12%	6%	6%
22	61%	63%	47%	50%
27	91%	90%	77%	72%
32	96%	95%	73%	76%
37	97%	96%	70%	78%
42	97%	97%	70%	79%
47	96%	97%	61%	78%
52	88%	92%	50%	70%
57	75%	79%	36%	55%
62	47%	46%	23%	38%
67	22%	22%	10%	10%

Year	Population 15-64	
	Males	Females
2005	69%	66%
2030	66%	62%
2055	57%	54%

The projected real GDP is obtained by applying the projected labour productivity per worker to the number of employed people required to produce total output. Unemployment is calculated from assumed unemployment rates and labour force.

Estimates of increases in total wages as well as the average wage earned are required.

Annual average real-wage increases are assumed to be equal to the increase in labour productivity as it is expected that wages will adjust to efficiency levels over time. Such increases are assumed to decrease gradually in the first years of the projection period from 2.6 in 2005 to 1.2 per cent in 2010 and then to increase to 1.9 in 2016 remaining constant at the level of 1.8 thereafter. The GDP deflator assumption affects nominal average wage increases.

I.3 Modelling the IKA scheme specific projections

Table AI. 4 Future IKA coverage rate, 2005-2055

Year	Males	Females
2005	47.5%	56.3%
2015	49.2%	61.4%
2025	49.7%	62.9%
2035	49.4%	62.9%
2045	49.0%	62.7%
2055	49.6%	63.5%

* Covered population 15-69 / Employed population 15-69

Table AI. 5 Active insured population, earnings and past credits as of valuation date (2005)

Ages	# of active insured			Average annual insurable earnings			Average # of years of contribution		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
15-19	27,067	17,114	44,181	8,957	6,804	8,123	2.9	3.0	2.9
20-24	149,030	125,970	275,000	11,463	9,955	10,772	4.5	4.5	4.5
25-29	232,592	202,598	435,190	13,376	11,963	12,718	6.1	6.2	6.2
30-34	227,259	173,936	401,195	15,519	13,575	14,676	9.1	8.5	8.9
35-39	202,153	146,377	348,530	16,407	13,436	15,159	13.1	11.1	12.3
40-44	156,274	114,249	270,523	16,853	13,333	15,366	16.7	13.5	15.4
45-49	135,140	96,879	232,019	17,505	13,311	15,754	20.6	16.0	18.7
50-54	112,273	67,368	179,641	18,143	13,142	16,268	24.7	17.8	22.1
55-59	84,659	36,213	120,872	17,941	12,661	16,359	27.3	17.6	24.4
60-64	28,013	11,023	39,036	16,558	12,178	15,321	26.0	16.6	23.3
65-69	6,606	3,178	9,784	15,736	11,396	14,326	25.2	16.2	22.2
All ages	1,361,066	994,905	2,355,971	15,450	12,513	14,210	13.4	10.2	12.1

Table AI. 6 Retirement and invalidity pensions-in-payment as of valuation date

Age	Retirement pension						Invalidity pension					
	Number			Average pension			Number			Average pension		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
15-19							184	143	327	7,522	7,526	7,526
20-24							403	221	624	7,193	7,285	7,229
25-29							702	360	1,062	6,873	7,149	6,964
30-34							1,341	601	1,942	6,520	6,766	6,595
35-39							2,105	1,061	3,166	6,479	6,756	6,572
40-44							3,175	1,683	4,858	6,557	6,495	6,535
45-49							4,994	2,766	7,760	6,749	6,130	6,528
50-54	1,389	6,020	7,408	16,898	9,443	10,841	7,925	3,978	11,903	6,977	5,855	6,602
55-59	13,653	22,519	36,172	15,916	7,785	10,854	12,545	5,138	17,683	7,059	5,395	6,575
60-64	48,832	33,268	82,100	12,141	7,212	10,144	12,976	4,062	17,038	6,810	5,295	6,448
65-69	80,130	45,243	125,374	9,608	6,417	8,456	12,797	4,719	17,516	6,476	5,265	6,150
70-74	79,816	44,440	124,255	8,247	5,978	7,436	12,259	5,613	17,872	6,428	5,244	6,056
75-79	63,527	36,183	99,710	7,543	5,850	6,929	10,399	6,256	16,655	6,270	5,183	5,861
80-84	32,664	17,975	50,639	7,244	5,719	6,703	5,480	3,899	9,379	6,145	5,279	5,785
85-89	13,591	7,250	20,841	6,853	5,663	6,439	2,473	2,050	4,523	5,992	5,486	5,763
90-94	5,037	2,712	7,749	6,464	5,343	6,072	1,086	768	1,853	5,805	5,577	5,711
95+	1,087	972	2,059	6,082	5,132	5,633	268	143	411	5,729	5,726	5,725
Total	339,725	216,583	556,308	9,154	6,478	8,112	91,113	43,459	134,571	6,601	5,535	6,257

Table AI. 7 Survivors' pensions-in-payment as of valuation date

Age	Widower(s)						Children, orphans and parents					
	Number			Average pension			Number			Average pension		
	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total
0-4							10	16	26	7,128	6,135	6,399
5-9							64	174	238	5,798	5,690	5,714
10-14							173	405	578	5,513	5,860	5,757
15-19	6	10	16	4,752	3,386	3,830	293	577	870	5,452	5,776	5,665
20-24	11	46	58	4,057	4,986	4,770	223	403	626	5,362	5,681	5,564
25-29	11	229	240	6,089	5,385	5,408	39	47	87	5,173	6,141	5,683
30-34	28	602	630	4,030	6,067	5,974	71	71	142	6,259	5,685	5,989
35-39	92	1,367	1,459	4,730	6,186	6,095	121	158	278	5,803	6,083	5,969
40-44	146	2,410	2,556	5,667	6,405	6,362	131	206	337	4,882	5,894	5,508
45-49	274	4,996	5,270	5,471	6,363	6,317	236	362	598	5,148	5,086	5,109
50-54	521	7,684	8,205	4,915	6,198	6,117	259	461	720	5,131	5,128	5,130
55-59	686	12,403	13,089	4,993	6,021	5,967	227	486	713	5,374	5,538	5,484
60-64	770	16,898	17,668	4,403	5,654	5,599	135	346	481	4,979	5,666	5,477
65-69	1,312	31,774	33,086	3,990	5,368	5,314	103	357	460	4,721	5,350	5,210
70-74	2,021	44,017	46,038	3,306	5,231	5,146	80	308	388	5,447	5,111	5,185
75-79	2,527	49,280	51,807	3,147	5,210	5,109	76	228	303	5,005	5,002	5,010
80-84	1,626	32,933	34,559	3,199	5,167	5,074	38	113	151	4,709	4,767	4,759
85-89	899	16,190	17,089	3,076	5,202	5,090	21	57	78	4,234	5,208	4,959
90-94	347	6,671	7,017	3,341	5,184	5,093	18	25	43	4,867	5,667	5,309
95+	69	1,516	1,585	2,689	6,402	6,239	27	25	52	1,961	3,457	2,674
Total	11,347	229,024	240,371	3,664	5,392	5,310	2,346	4,824	7,170	5,255	5,492	5,414

Table AI. 8 Density of contributions

Age	Males	Females
17	21%	27%
22	31%	59%
27	37%	80%
32	71%	80%
37	80%	82%
42	81%	85%
47	81%	86%
52	82%	84%
57	77%	81%
62	72%	74%

Table AI. 9 Probability of a deceased having eligible survivors and their average ages

Age	Males		Females	
	Probability of being married	Avg # of eligible children	Probability of being married	Avg # of eligible children
17	15.9%	0.02	12%	0.02
22	28.2%	0.05	18%	0.04
27	38.5%	0.06	22%	0.05
32	46.9%	0.07	26%	0.05
37	53.6%	0.06	28%	0.05
42	58.9%	0.05	30%	0.05
47	62.8%	0.04	30%	0.04
52	65.7%	0.03	30%	0.03
57	67.7%	0.02	30%	0.02
62	68.9%	0.01	29%	0.02
67	69.6%	0.01	28%	0.02
72	69.9%	0.01	26%	0.02
77	70.1%	0.01	25%	0.02
82	70.1%	0.01	24%	0.02
87	70.1%	0.01	23%	0.02

Table AI. 10 Distribution of new entrants

Age	Male	Female
15	1.1%	0.8%
16	3.4%	2.7%
17	6.4%	5.3%
18	9.0%	7.7%
19	10.7%	9.6%
20	11.4%	10.5%
21	11.0%	10.6%
22	10.0%	10.0%
23	8.6%	8.9%
24	7.1%	7.7%
25	5.7%	6.3%
26	4.4%	5.1%
27	3.3%	3.9%
28	2.4%	3.0%
29	1.7%	2.2%
30	1.2%	1.6%
31	0.9%	1.2%
32	0.6%	0.8%
33	0.4%	0.6%
34	0.3%	0.4%
35 +	0.4%	0.8%

Table AI. 11 Invalidity rates

Age	Male	Female
15	0.04%	0.02%
20	0.04%	0.02%
25	0.06%	0.03%
30	0.08%	0.06%
35	0.13%	0.12%
40	0.21%	0.25%
45	0.37%	0.42%
50	0.73%	0.75%
55	1.34%	1.13%
60	2.18%	1.50%
65	2.98%	1.87%

Table AI. 12 Retirement rates

Age	MaleGenPre	FemGenPre	MaleArdPre	FemArdPre	MaleConPre	FemConPre	MaleGenPost	FemGenPost	MaleArdPost	FemArdPost	MaleConPost	FemConPost
55	3%	14%	5%	23%	0%	26%	3%	14%	5%	23%	0%	26%
56	5%	12%	6%	16%	0%	7%	5%	12%	6%	16%	0%	7%
57	6%	10%	7%	13%	0%	12%	6%	10%	7%	13%	0%	12%
58	14%	11%	17%	13%	45%	11%	14%	11%	17%	13%	45%	11%
59	14%	12%	17%	17%	23%	40%	14%	12%	17%	17%	23%	40%
60	18%	29%	47%	21%	30%	39%	18%	29%	47%	21%	30%	39%
61	14%	22%	29%	19%	21%	23%	14%	22%	29%	19%	21%	23%
62	15%	19%	21%	14%	18%	23%	15%	19%	21%	14%	18%	23%
63	14%	16%	17%	17%	21%	19%	14%	16%	17%	17%	21%	19%
64	19%	20%	21%	24%	34%	47%	19%	20%	21%	24%	34%	47%
65	43%	25%	43%	33%	44%	43%	43%	25%	43%	33%	44%	43%
66	32%	26%	31%	31%	31%	50%	32%	26%	31%	31%	31%	50%
67	30%	28%	34%	32%	32%	17%	30%	28%	34%	32%	32%	17%
68	23%	24%	28%	30%	33%	38%	23%	24%	28%	30%	33%	38%
69	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table AI. 13 Average number of years credited since registration by sex, age and group

Age	MaleGenPre	FemGenPre	MaleArdPre	FemArdPre	MaleConPre	FemConPre	MaleGenPost	FemGenPost	MaleArdPost	FemArdPost	MaleConPost	FemConPost
55	30.5	22.5	30.8	18.8	23.6	15.0	8.0	7.4	8.3	8.0	7.0	6.4
56	31.3	22.4	30.9	18.4	24.5	15.2	7.9	7.4	8.0	7.9	7.1	7.1
57	31.6	21.9	31.3	18.3	24.8	13.9	8.1	7.5	8.0	8.2	7.0	5.8
58	31.4	22.2	31.1	18.6	22.6	11.8	8.0	7.4	8.6	8.1	7.1	6.7
59	31.0	21.8	31.0	18.7	21.4	16.7	8.2	7.5	8.5	8.2	7.1	6.0
60	30.8	20.6	28.9	18.4	20.8	11.6	8.0	7.6	8.2	8.3	7.1	7.3
61	30.7	19.9	27.2	19.0	21.2	12.8	8.2	7.5	8.3	8.4	7.1	6.5
62	30.3	20.0	26.5	19.1	21.0	15.3	8.0	7.5	8.5	7.9	7.2	7.1
63	30.2	18.9	26.7	19.4	21.1	13.5	8.2	7.3	8.8	8.5	7.3	7.8
64	30.4	19.6	26.5	19.0	21.6	10.9	8.3	7.4	8.4	7.8	7.5	5.8
65	29.1	18.8	26.7	20.3	22.4	11.1	8.1	7.7	8.8	8.5	7.2	5.2

* Gen = General, Ard = Arduous, Con = Construction, Pre = first register before 1993 and Post = first register after 1992

I.4 Modeling the OGA scheme specific projections

Table AI. 14 Number, average annual insurable earnings, average number of years of contributions and distribution of new entrants, active insured members as of valuation date

Ages	Number of active insured			Average annual insurable earnings			Average number of years of contribution			Distribution of new entrants		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female 2006	Female 2016
15-19	6	7	13	4,406	4,455	4,432	1.0	1.0	1.0	0%	0%	0%
20-24	4,417	1,879	6,296	4,521	4,494	4,513	2.3	2.2	2.3	17%	7%	17%
25-29	19,863	11,972	31,835	4,570	4,529	4,554	4.0	4.2	4.1	24%	15%	24%
30-34	34,570	25,996	60,566	4,650	4,606	4,631	8.1	8.3	8.2	17%	14%	17%
35-39	41,425	38,553	79,978	4,770	4,700	4,736	11.0	11.2	11.1	14%	13%	14%
40-44	41,475	45,098	86,573	4,919	4,819	4,867	11.3	11.7	11.5	10%	11%	10%
45-49	41,744	51,359	93,103	5,049	4,989	5,016	11.8	12.3	12.1	8%	12%	8%
50-54	37,972	54,765	92,737	5,211	5,183	5,194	12.2	12.8	12.6	5%	12%	5%
55-59	39,414	64,920	104,334	5,519	5,522	5,521	12.9	13.4	13.2	3%	9%	3%
60-64	39,791	67,728	107,519	6,312	6,306	6,308	15.4	15.8	15.6	2%	7%	2%
65-69	4,353	7,535	11,888	6,846	6,720	6,767	15.1	15.1	15.1	0%	0%	0%
All ages	305,030	369,812	674,842	5,181	5,292	5,242	11.3	12.5	11.9	100%	100%	100%

Table AI. 15 Number and yearly average amount of old-age and disability pensions-in-payment as of valuation date, Basic branch

Age	Retirement pension						Invalidity pension					
	Male		Female		Total		Male		Female		Total	
	Number	Avg	Number	Avg	Number	Avg	Number	Avg	Number	Avg	Number	Avg
15-19	-	-	-	-	-	-	18	3,200	9	4,276	27	3,559
20-24	-	-	-	-	-	-	391	4,025	237	3,812	628	3,945
25-29	-	-	-	-	-	-	832	4,286	525	4,437	1,357	4,344
30-34	-	-	-	-	-	-	1,361	4,250	861	4,357	2,222	4,291
35-39	-	-	-	-	-	-	2,187	4,181	1,400	4,298	3,587	4,227
40-44	-	-	-	-	-	-	2,774	4,005	2,029	3,972	4,803	3,991
45-49	-	-	-	-	-	-	3,598	3,955	2,937	3,813	6,535	3,891
50-54	-	-	-	-	-	-	4,075	3,803	4,075	3,648	8,150	3,725
55-59	-	-	-	-	-	-	5,113	3,586	6,338	3,445	11,451	3,508
60-64	-	-	-	-	-	-	6,815	3,405	9,077	3,291	15,892	3,340
65-69	45,397	2,759	81,038	2,828	126,435	2,803	9,936	3,425	14,106	3,306	24,042	3,356
70-74	67,643	2,785	113,059	2,906	180,702	2,861	8,988	3,534	13,109	3,462	22,097	3,491
75-79	65,319	2,844	109,166	2,944	174,485	2,906	6,960	3,681	11,927	3,544	18,887	3,595
80-84	32,547	2,934	59,282	2,982	91,829	2,965	5,616	3,599	10,971	3,440	16,587	3,494
85-89	16,937	3,016	37,011	3,018	53,948	3,017	2,507	3,639	4,978	3,580	7,485	3,600
90-94	10,353	3,049	22,423	3,048	32,776	3,048	755	3,906	1,315	3,767	2,070	3,818
95+	4,045	3,076	10,722	3,054	14,767	3,060	96	3,799	125	3,919	221	3,867
Total	242,241	2,848	432,702	2,932	674,942	2,902	62,022	3,653	84,019	3,501	146,041	3,566

Table AI. 16 Number and yearly average amount of uninsured pensions in-payment as of valuation date, Basic branch

Age	Retirement pension					
	Male		Female		Total	
	Number	Avg	Number	Avg	Number	Avg
65-69	6,019	2,980	8,846	2,980	14,865	2,980
70-74	7,423	2,980	10,788	2,980	18,211	2,980
75-79	4,986	2,980	9,076	2,980	14,061	2,980
80-84	2,960	2,980	6,739	2,980	9,699	2,980
85-89	1,790	2,980	5,093	2,980	6,883	2,980
90-94	1,116	2,980	3,933	2,980	5,049	2,980
95+	470	2,980	1,950	2,980	2,420	2,980
Total	24,764	2,980	46,424	2,980	71,188	2,980

Table AI. 17 Number and yearly average amount of old-age and disability pensions-in-payment as of valuation date, Additional branch

Age	Retirement pension						Invalidity pension					
	Male		Female		Total		Male		Female		Total	
	Number	Avg	Number	Avg	Number	Avg	Number	Avg	Number	Avg	Number	Avg
15-19	-	-	-	-	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	-	-	-	-	-	-
25-29	-	-	-	-	-	-	-	-	-	-	-	-
30-34	-	-	-	-	-	-	1	957	1	649	2	803
35-39	-	-	-	-	-	-	146	518	99	503	245	512
40-44	-	-	-	-	-	-	438	616	328	621	766	618
45-49	-	-	-	-	-	-	536	654	452	691	988	671
50-54	-	-	-	-	-	-	587	714	677	747	1,264	732
55-59	-	-	-	-	-	-	934	760	1,259	759	2,193	759
60-64	-	-	-	-	-	-	1,366	802	1,997	780	3,363	789
65-69	28	1,119	71	1,119	99	1,119	2,724	821	4,211	779	6,935	795
70-74	27,832	1,143	46,613	1,133	74,445	1,137	3,127	736	4,510	668	7,637	696
75-79	55,183	520	92,910	512	148,093	515	1,052	334	1,687	299	2,739	312
80-84	13,165	226	26,182	225	39,347	225	35	208	70	208	105	208
85-89	2	427	9	428	11	428	-	-	-	-	-	-
90-94	-	-	2	204	2	204	-	-	-	-	-	-
95+	-	-	-	-	-	-	-	-	-	-	-	-
Total	96,210	660	165,787	642	261,997	648	10,946	714	15,291	680	26,237	694

Table AI. 18 Number and yearly average amount of old-age and disability pensions-in-payment as of valuation date, Main branch

Age	Retirement pension						Invalidity pension					
	Male		Female		Total		Male		Female		Total	
	Number	Avg	Number	Avg	Number	Avg	Number	Avg	Number	Avg	Number	Avg
15-19	-	-	-	-	-	-	-	-	-	-	-	-
20-24	-	-	-	-	-	-	3	1,847	1	1,539	4	1,770
25-29	-	-	-	-	-	-	32	1,673	21	1,843	53	1,741
30-34	-	-	-	-	-	-	112	1,745	74	2,190	186	1,922
35-39	-	-	-	-	-	-	310	1,945	226	2,299	536	2,094
40-44	-	-	-	-	-	-	502	2,321	477	2,411	979	2,365
45-49	-	-	-	-	-	-	817	2,453	769	2,239	1,586	2,349
50-54	-	-	-	-	-	-	1,076	2,515	1,346	2,175	2,422	2,326
55-59	-	-	-	-	-	-	1,660	2,476	2,244	2,148	3,904	2,288
60-64	-	-	-	-	-	-	2,659	2,504	3,456	2,096	6,115	2,274
65-69	41,100	2,666	76,886	2,270	117,986	2,408	2,963	2,437	3,486	2,010	6,449	2,206
70-74	29,424	2,197	51,380	1,871	80,804	1,990	528	2,119	510	1,871	1,038	1,997
75-79	2	2,518	18	1,850	20	1,917	1	1,859	1	2,020	2	1,940
80-84	1	1,521	2	2,317	3	2,052	-	-	-	-	-	-
85-89	-	-	2	2,319	2	2,319	-	-	-	-	-	-
90-94	-	-	-	-	-	-	-	-	-	-	-	-
95+	-	-	-	-	-	-	-	-	-	-	-	-
Total	70,527	2,470	128,288	2,110	198,815	2,238	10,663	2,424	12,611	2,105	23,274	2,251

Table AI. 19 Survivors' pensions-in-payment as of valuation date

	Children, Orphans and Parents					
	Basic		Main		Additional	
Age	Number	Avg	Number	Avg	Number	Avg
0-4	1,000	3,163	320	1,148	212	1,148
5-9	1,000	3,163	320	1,148	212	1,148
10-14	1,000	3,163	320	1,148	212	1,148
15-19	1,000	3,163	320	1,148	212	1,148
20-24	-	-	320	1,148	212	1,148
25-29	-	-	320	1,148	212	1,148
30-64	-	-	-	-	-	-
65-69	-	-	540	1,148	-	-
70-74	-	-	540	1,148	-	-
75-79	-	-	540	1,148	-	-
80-84	-	-	540	1,148	-	-
85-89	-	-	540	1,148	-	-
90-94	-	-	540	1,148	-	-
95+	-	-	540	1,148	-	-
Total	4,000	3,163	5,699	1,148	1,270	1,148

Table AI. 20 Density of contributions

Age	Males	Females
17	0%	0%
22	87%	96%
27	94%	97%
32	96%	98%
37	98%	98%
42	98%	99%
47	98%	99%
52	98%	99%
57	98%	99%
62	98%	98%

Table AI. 21 Invalidity rates

Age	Male	Female
17	0.00064	0.00074
22	0.00064	0.00074
27	0.00078	0.00095
32	0.00107	0.00129
37	0.00148	0.00175
42	0.00205	0.00237
47	0.00293	0.00357
52	0.00479	0.00576
57	0.00768	0.00889
62	0.01196	0.01334

Table AI. 22 Statistics related to family and disability increments, Basic branch

	Males					Females				
	Old age pension		Disability			Old age pension		Disability		
Average Increment / Age	marital	dependant children	marital	dependant children	disability percentage	marital	dependant children	marital	dependant children	disability percentage
17	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%
27	0%	1%	0%	0%	60%	0%	2%	0%	0%	49%
32	1%	2%	0%	0%	48%	1%	8%	0%	0%	52%
37	1%	4%	0%	0%	50%	2%	14%	0%	0%	53%
42	3%	7%	0%	0%	44%	6%	12%	0%	0%	48%
47	10%	7%	0%	0%	40%	13%	6%	0%	0%	37%
52	23%	6%	0%	0%	37%	15%	3%	0%	0%	32%
57	33%	3%	0%	0%	31%	15%	1%	0%	0%	28%
62	37%	1%	1%	0%	24%	10%	0%	0%	0%	17%
67	31%	1%	1%	0%	19%	3%	0%	0%	0%	13%
72	17%	1%	0%	0%	21%	1%	0%	0%	0%	16%
77	7%	2%	0%	0%	26%	0%	0%	0%	0%	21%
82	3%	1%	0%	0%	24%	0%	0%	0%	0%	20%
87	4%	2%	0%	0%	24%	0%	0%	0%	0%	19%

Table AI. 23 Statistics related to family and disability increments, Main branch

	Males					Females				
	Old age pension		Disability			Old age pension		Disability		
Average Increment / Age	marital	dependant children	marital	dependant children	disability percentage	marital	dependant children	marital	dependant children	disability percentage
17	10%	0%	0%	0%	0%	1%	0%	0%	0%	0%
22	10%	0%	0%	0%	0%	1%	0%	0%	0%	0%
27	10%	0%	3%	2%	0%	1%	0%	7%	11%	0%
32	10%	0%	6%	7%	4%	1%	0%	8%	27%	0%
37	10%	0%	8%	14%	0%	1%	0%	13%	37%	0%
42	10%	0%	10%	23%	1%	1%	0%	11%	25%	1%
47	10%	0%	14%	23%	1%	1%	0%	13%	11%	0%
52	10%	0%	17%	13%	1%	1%	0%	13%	4%	1%
57	10%	0%	19%	5%	1%	1%	0%	9%	1%	1%
62	10%	0%	18%	1%	1%	1%	0%	5%	0%	1%
67	10%	0%	13%	1%	1%	1%	0%	1%	0%	1%
72	10%	0%	2%	0%	1%	1%	0%	9%	0%	0%
77	10%	0%	0%	0%	0%	1%	0%	0%	0%	0%
82	10%	0%	0%	0%	0%	1%	0%	0%	0%	0%
87	10%	0%	0%	0%	0%	1%	0%	0%	0%	0%

Appendix II Summary of provisions of IKA as of valuation date

The following summary provides a general overview of the key coverage, contribution and benefit provisions as at December 2005.

II.1 Contingencies covered

The Social Insurance Institute provides the following benefits:

Long-term benefits:
Old age, Disability and Survivors

Short-term benefits:
Sickness, Maternity and Medical

Employment injury benefits:
Temporary disability, Permanent disability, Medical expenses and Survivors

II.2 Insured people

The Social Insurance Institute covers employees in industry, commerce, and related occupations and certain urban self-employed persons (including actors, newspaper vendors, and chartered accountants). The coverage is compulsory, except for Greeks living abroad and specific self-employed persons who can be insured on a voluntary basis. There are special systems for agricultural workers, shipping agents, doctors and dentists, commercial motor vehicle operators, architects, notaries, public-sector employees, tradesmen, and craftsmen.

II.3 Maximum and minimum insurable earnings

The maximum amount of earnings for contribution and benefit purposes for those who were first insured after December 31, 1992, is €68,337.92 a year, or 14 monthly salaries of €4,881.28. There are no minimum earnings for contribution and benefits purposes.

II.4 Contribution Rates of the Social Insurance Institute as of valuation date

Contributions payable by employers and employees are based on the monthly earnings of the insured person. The total contribution for long-term benefits on behalf of an employed person is 6.67 per cent of monthly earning; 8.87 per cent of monthly earnings if in arduous or unhealthy employment. The contributions are shared between employer and employee with a ratio of 2 to 1. Therefore, the employer's contribution is 13.33 per cent of the monthly payroll; 14.73 per cent if the employee is in arduous or unhealthy work. The government contributes 10 per cent of the annual payroll as an employer and a guaranteed annual state subsidy.

Contributions payable by employees in respect of sickness and maternity are 0.4 per cent for cash benefits and 2.15 per cent for medical benefits. These contributions are also shared between employer and employee with a ratio of 2 to 1 so that employers contribute 0.8 per cent of the monthly payroll for cash benefits and 4.3 per cent for medical benefits. The government guarantees an annual State subsidy.

Self-employed persons contribute at the same level as regular employees.

II.5 Benefit provisions of IKA as at valuation

a. Long-term benefits

(a) Retirement Pension (full pension)

Age requirement and contribution requirement:

- People insured before 31.12.1992:

Condition	Days of employment	Age	
		Men	Women
General	4,500	65	60
	10,000	62	57
	10,500	58	58
	11,100	No limit	No limit
Arduous / Unhealthy	10,500 and at least 7,500 of these in arduous/unhealthy occupations	55	55
	4,500 and at least 3,600 of these in arduous/unhealthy occupations, including 1,000 (arduous/unhealthy occupations) during the last 13 years	60	55
Construction	4,500 and at least 3,600 of these in constructions including 1,000 during the last 13 years	58	53
	4,500 in constructions including 500 during the last 13 years	58	53
Mothers of underage children	5,500	-	55

- People insured since 1.1.1993:

Condition	Days of employment	Age	
		Men	Women
General	4,500	65	65
	11,100	No limit	No limit
Arduous / Unhealthy	4,500 and at least 3/4 of these in arduous/unhealthy occupations	60	60
Mothers of underage children	6,000 with an underage child	-	55
	6,000 and at least 3 children	-	65 - 3×*n* (*)

- The age limit of 65 is decreased by three years for each child with a minimum age limit of 50 years.
-

Amount of Benefits:

- People insured before 31.12.1992:

The old-age pension consists of the two following amounts:

i) The basic amount which is defined as a percentage of pensionable earnings (earnings in the best five years of the last ten years) according to the insurance class to which the insured individual is assigned.
ii) A pension increase which is calculated as 1 per cent of earnings for every 300 days of contributions between 3,300 days and 7,800 days and as 1.5 to 2.5 per cent (depending on wage class) for every 300 days beyond 7,800.

This pension is increased by 1.5 times the daily wage of an unqualified worker for a non-working and non-pensionable spouse. Additionally, there is a further increase of 20 per cent for the first child, 15 per cent for the second child and 10 per cent for the third. Children must be under age 18 years (24 if studying) or unable to work.

- People insured since .1.1.1993:

Earnings (for the calculation of pension)

- The determination of the monthly pension is based on the ratio of total monthly earnings (excluding Christmas, Easter and leave bonuses) in the immediate five years prior to retirement, divided by the number of months worked within this period.
- Earnings in the calendar years prior to the year of retirement are increased by the percentage increase in IKA pensions.

Calculation of basic monthly pension

- The accrual rate for old-age and disability pensions, is 2 per cent up to the 35th year of contributions. For every year of service beyond 35, between the age of 65 and 67, the amount increases to 3 per cent of the monthly pension.
- The basic pension amount, which is calculated as described above, is increased by 8 per cent for the first child, 10 per cent for the second child, and 12 per cent for the third child. For more than three children the increase is also 12 per cent. Children should be under age or unable to work. In the cases of students, the increased pension amount is paid until they reach the age of 24 years.

Monthly Minimum Basic Pension:

- People insured before 31.12.1992:

Single person	€ 428.24
Insured person with spouse	€ 459.74
Insured person with spouse and one child	€ 480.20
Insured person with spouse and two children	€ 500.40
Insured person with spouse and three children	€ 520.67
Single person with one child	€ 449.39
Single person with two children	€ 470.05
Single person with three children	€ 490.30

- People insured since .1.1.1993:

Single person	€ 436.26
Insured person with one child	€ 458.06
Insured person with two children	€ 484.24
Insured person with three children	€ 514.78
Insured person with four children	€ 545.32
Insured person with five children	€ 575.86

Those who get the minimum pension and have, in total, more than 4,500 days of employment, receive for each 300 days of employment (exceeding the 4,500) a 1 per cent increase of the Basic Monthly Pension as initially calculated and before it is adjusted to the minimum pension.

Monthly Maximum Pension: € 3,239

Duration of Pension: Payable for life.

(b) Early Retirement Pension (reduced pension)

Age Requirement and contribution Requirement:

- People insured before 31.12.1992:

Condition	**Days of employment**	**Age**	
		Men	**Women**
General	4,500 including at least 100 for each of the last 5 years	60	55
	10,000 including at least 100 for each of the last 5 years	60	55
Arduous / Unhealthy	10,500 and at least 7,500 of these in arduous/unhealthy occupations	53	53
Mothers of underage children	5,500	-	50

- People insured since 1.1.1993:

Condition	**Days of employment**	**Age**	
		Men	**Women**
General	4,500 including 750 during the last 5 years	60	60
	10,500	55	55
Mothers of underage children	6,000	-	50

Amount of Benefits:

The reduction rate is set at 1/267 for every month short of the age limit for full pension rights.

(c) Invalidity Pension

Eligibility:

For the full pension, the insured must be assessed as, at least, 80 per cent disabled with a minimum of 4,500 days of contributions (1,500 days if the insured began working after 1993); 300 days if younger than 21 years. From age 21, the number of required contribution days increases with age up to the maximum); or 1,500 days of contributions, including 600 days in the five years before the onset of disability. (For the insured, who began working after 1993, the number of contribution days in the five years before the onset of disability can include days of contribution credited.)

For partial disability, the insured must be assessed as, at least, 50 per cent disabled. No benefit is payable for an assessed degree of disability of 49 per cent or less.

Amount of Benefits:

For the full pension (assessed degree of disability of 80 per cent or more), the amount is the same as the retirement pension. For an assessed degree of disability of 67 to 79.9 per cent, 75 per cent of the pension is paid. For an assessed degree of disability of 50 to 66.9 per cent, 50 per cent of the pension is paid.

The minimum and the maximum pension are the same as the retirement pension.

Benefits are payable fourteen times per year.

(d) Survivors' Pension

Eligibility:

The qualifying conditions vary according to the date the deceased first entered the system. Normally, the number of contribution days is half that required for the disability pension (see above).

For persons first insured before 1 January 1993, eligible survivors include a widow (or a disabled widower without means) who was married to the deceased for at least six months (two years if the deceased was a pensioner); a divorced spouse with limited income who was married to the deceased for at least 15 years and was receiving alimony; dependent children up to age 18 years (age 24 years if a student, disabled, or a full orphan); dependent grandchildren and stepchildren; and dependent parents.

For those first insured after 31 December 1992, eligible survivors include a widow(er) who was married to the deceased for at least one year (two years if the deceased was a pensioner; the marriage condition is waived if the spouse has a dependent child); a divorced spouse with limited income who was married to the deceased for at least 15 years and was receiving alimony; and dependent children up to age 18 years (age 24 years if a student, disabled, or a full orphan).

Amount of Benefits:

Survivor pension: The pension varies according to the date the deceased first entered the system. The surviving spouse, irrespective of age, is entitled to the survivor pension for a period of three years beginning in the month following the insured's death. A surviving spouse receives the full pension payable to the deceased provided that they do not work or

receive any other pension or have an assessed degree of disability of, at least, 67 per cent; 70 per cent is paid if the spouse is within three years of age 65 and working or receiving a pension; 50 per cent if the spouse is younger than age 65 and working or receiving a pension; or 70 per cent if the spouse is age 65 or older and working or receiving a pension.

The pension ceases on remarriage.

A surviving divorced spouse may receive a pension equal to 30 per cent of the survivor pension if they were married to the deceased for at least 15 years; 40 per cent if married for at least 25 years. An eligible surviving divorced spouse is not entitled to receive the minimum survivor pension or the survivor social solidarity grant.

Orphan's pension: If the deceased was first insured before 1 January 1993, each orphan up to age 18 years (age 24 years if a student, no limit if disabled) receives 25 per cent of the insured's basic pension; 50 per cent for a full orphan. If the deceased was first insured after 31 December 1992, each orphan up to age 18 years (age 24 years if a student, no limit if disabled) receives 20 per cent of the insured's basic pension; 60 per cent for a full orphan.

Grandchild's or parent's pension (in the absence of other eligible survivors): 20 per cent of the deceased's pension is paid for a grandchild up to age 18 years (age 24 years if a student, no limit if disabled); 40 per cent for a widowed mother; 40 per cent for a dependent father. (The deceased must have been insured before 1 January 1993.)

The minimum survivor pension is €385.70 a month for those first insured before 1 January 1993; €349 a month for those first insured after 31 December 1992.

The maximum survivor pension is 100 per cent of the deceased's pension.

Benefits are payable fourteen times per year.

Duration of Benefits:

The surviving spouse, irrespective of age, is entitled to the survivor pension for a period of three years beginning the month following the insured's death; survivors may receive benefits beyond three years provided they do not work or receive any other pension or are assessed with a mental or physical disability of, at least, 67 per cent. Survivor pensions that have been interrupted or reduced will be paid in full when the survivor reaches age 65.

b. Employment injury benefits

Eligibility:

There is no contributions requirement for employment injury benefits. The injury must be reported in the five days following the accident. Accidents that occur while commuting to and from work are covered.

Amount of Benefits:

(a) Temporary Disability Benefits

The benefit is equal to 50 per cent of daily earnings, according to one of 28 wage classes.

Dependent's supplement: 10 per cent of the benefit is paid for each dependent, up to a maximum of 40 per cent.

The maximum daily benefit, including dependents' supplements, for the first 15 days must not exceed €14.03; from the 16th day to the 30th day, €25.86; after the 30th day, the maximum must not exceed 70 per cent of the daily wage of the insurance class in which the worker is classified. If the insured is hospitalized and there are no dependents, the benefit is paid at 33 per cent of the awarded rate.

(b) Permanent Disability Benefits

The benefits are equal to the invalidity pension described in the Long-Term Benefits section.

(c) Survivors Benefits

The benefits are equal to the survivor pension described in the Long-Term Benefits section.

Appendix IIII Summary of provisions of OGA as of valuation date

III.1 Basic Branch

PENSION NAME	**BASIC PENSION**	CATEGORY					
		A: without family protected memebers					
LAW	4169/1961	B: married with non pensioner spouse, under 65				1296/1982	
		C: with at least one child under 18					
Number of pensions per year	14						
KIND OF BENEFIT:	OLD AGE PENSION	DISABILITY PENSION	CHILDREN'S DISABILITY PENSION	WIDOW/ER PENSION	ORPHANS PENSION	UNINSURED OVER AGED PENSION	FUNERAL GRANT
ELIGIBILITY CONDITIONS	Age 65, at least 25 years of work after the age of 21.	Diasbility at least 67%, confirmed after at least 3 years of sickness, Disability has occurred between 21 and 65, Working time at least 5 years before the diasbility advent.	Disability at least 67%, at least 3 years of sickness, 18 years old, not receiving any pension from other source, one of the parents must be OGA pensioner or OGA insured for at least 3 years.	65 years old, Married before, not receiving pension from any other source, Pension amount minimum OGA pension (category A), Practically no widow/er basic pension emerges	Orphans from both parents,under 18, (or under 24 in case of studies), Non other source pensioners , Dead parents must be OGA pensioner or at least 3 years OGA insured, Pension amount minimum OGA pension (category A)	65 year old, Non other source pensioner, Total income under minimum OGA annual pension.	OGA pensioner, or OGA main pension insured without contributions owing during the last 6 months before death has occurred
COMMENTS	Gradual abolishment starting from 2003 and ending at 2026 (2003 pension is 4% less than 2002 pension, 2004 pension is 8% less than 2002 pension, after indexing according income policy, no new basic pension pensioners after 2027)					No gradual abolishment	
PENSION AMOUNT A NEW 2004			184.74			200.80	500 from1/5/2003
PENSION, AMOUNT A NEW 2003			193.97			200.80	630 from 1/6/2005
PENSION, AMOUNT A OLD			200.80			200.80	
PENSION, AMOUNT B NEW 2004		187.43				203.73	
PENSION, AMOUNT B NEW 2003		196.78				203.73	
PENSION, AMOUNT B OLD		203.73				203.73	
PENSION, AMOUNT C NEW 2004		190.12				206.65	
PENSION, AMOUNT C NEW 2003		199.58				206.65	
PENSION, AMOUNT C OLD		206.65				206.65	
ADDITIONAL INCREASE FOR BLINDNESS	= each time maximum pension =206,65						
ADDITIONAL INCREASE FOR TOTAL DISABILITY			=20*(UWDE)				
ADDITIONAL INREASE FOR PARA/TETRAPLEGIA			=20*(UWDE)				
PENSION INDEXING	Decree according annual income policy						
(UWDE): Unspecialised Worker Daily Earnings, Indexed according to the unique collective work contract							

III.2 Additional Branch

PENSION NAME	**ADDITIONAL PENSION**	CLASS	BENEFIT COEFFICIENT	
		A	0.3	MANDATORY
LAW	1745/1987	B	0.425	VOLUNTARY
		C	0.55	VOLUNTARY
DURATION	The "additional pension" branch is abolished from the begining of the "main pension branch" (law 2485/1997) which is its total successor.			
Number of pensions per year	14			
KIND OF BENEFIT:	OLD AGE PENSION	DISABILITY PENSION	ORPHANS PENSION	
ELIGIBILITY CONDITIONS	Eligible for OGA basic pension, at least 5 years insured in the branch since 1993,insured 1 year more from each year after 1993 for years 1994- 1997, year of branch abolishment.		The deceased person is eligible for additional pension at the year of his death. Orphans or disabled descendants get additional pension if and while they are eligible for the basic orphans pension.	
COMMENTS	Time spent insured in the "additional pension" branch, abolished after 1998, is counting for the "main isnurance" branch, after application		For more than 1 descendants, pension amount is divided in equal parts. Each part cannot be less than 6,86 or 13,72 in the case of the death of both parents.	
PENSION AMOUNT	=(UWDE)*[(years in class A)*0,3 + (years in class B)*0,425+ (years in class C)*0,55]			
MINIMUM PENSION	13.72		6.86	
MAXIMUM PENSION	133.21			
PENSION INDEXING	Decree according annual income policy			
(UWDE): Unspecialised Worker Daily Earnings, Indexed according to the unique collective work contract				

III.3 Main Branch

NAME	**MAIN PENSION**	CATEGORY	AMOUNT 2004		
		1	352.15	mandatory	
LAW	2458/1997	2	436.51	voluntary	
		3	525.27	voluntary	
Number of pensions per year	14	4	648.16	voluntary	
Number of contributions per year	12	5	771.05	voluntary, mandatory for employees	
		6	893.07	voluntary	
		7	1014.18	voluntary	
KIND OF BENEFIT:	OLD AGE PENSION	DISABILITY PENSION FROM COMMON SICKNESS	DISABILITY PENSION FROM WORK ACCIDENT	DISABILITY PENSION FROM ACCIDENT OUT OF WORK	SURVIVORS PENSION
ELIGIBILITY CONDITIONS	Age 65, 6 years of contributions in the branch (5 years since 2003 and 1 year more for every year after 2003 since 15 years are reached for 2018 and after pensioners)	At least 67% disability, sickness of at least 1 year, 5 years insured (2 of those in the last 5 years before the disability advent) or 15 years of insurance.	Independently from the time insured	Insurance for half the years of the case of common sickness disability pension.	The deceased person is eligible for disability pension, the survival person should not be working in a profession not covered by OGA or being an outside OGA pensioner. Descendants must be under 18, under 24 if studying and without age limit if disabled.
COMMENTS	Time spent insured in the "additional pension" branch, abolished after 1998, is counting for the "main insurance" branch, after application.				50% to survival spouse, 25% for every descendant until the maximum of 100% of the deceased pension is reached.
PENSION AMOUNT	=2%*[(years in CATEGORY 1)* (AMOUNT OF CATEGORY 1) + (years in CATEGORY 2)* (AMOUNT OF CATEGORY 2) +…+ (years in CATEGORY 7)* (AMOUNT OF CATEGORY 7)]				
MINIMUM PENSION		105.65	140.86	105.65	
PENSION LOADINGS					
SPOUSE ADDITIVE	=10%*1 st CATEGORY AMOUNT = 35,22				
FIRST CHILD ADDITIVE	=8%*1 st CATEGORY AMOUNT =28,17				
SECOND CHILD ADDITIVE	=10%*1 st CATEGORY AMOUNT =35,22				
THIRD AND AFTER CHILD ADDITIVE	=12%*1 st CATEGORY AMOUNT =42,26				
TOTAL DISABILITY ADDITIVE		50% OF PENSION AMOUNT			
MINIMUM TOTAL DISABILITY ADDITIVE		176.08			
BLINDNESS ADDITIVE	=maximum basic pension				
PARA/TETRAPLIGIC ADDITIVE	=20*(UWDE)				
PENSION INDEXING	Decree according annual income policy				

Appendix IV Summary of IKA actuarial projections

Table AIV. 1 IKA sensitivity tests description

Scenario	Description
Lower Indexation (inflation)	Indexation equals to Inflation from 2008
Higher Indexation (wage)	Indexation equals to wage growth from 2008
Lower Mortality	Mortality rates adjusted to 75% of the base scenario level
Higher Mortality	Mortality rates adjusted to 125% of the base scenario level
Lower Density	Density adjusted to 90% of the base scenario level over 30 years
Higher Density	Density adjusted to 110% of the base scenario level over 30 years (max 100%)
Lower initial past credit	Initial average years of contribution adjusted to 90% of the base scenario level
Higher initial past credit	Initial average years of contribution adjusted to 110% of the base scenario level

Table AIV. 2 IKA projected cost under different sensitivity tests, 2005-2055

Scenario	GAP	PAYG			Deficit / GDP		
		2005	2030	2055	2005	2030	2055
Base	**35.3%**	**26.1%**	**32.3%**	**59.3%**	**0.7%**	**2.1%**	**7.0%**
Lower Indexation (inflation)	33.0%	26.1%	30.3%	52.5%	0.7%	1.7%	5.8%
Higher Indexation (wage)	41.3%	26.1%	37.5%	77.9%	0.7%	3.0%	10.4%
Lower Mortality	37.1%	26.1%	34.0%	63.3%	0.7%	2.4%	7.8%
Higher Mortality	33.8%	26.1%	30.9%	55.8%	0.7%	1.8%	6.4%
Lower Density	37.4%	26.1%	35.1%	63.7%	0.7%	2.4%	7.1%
Higher Density	33.9%	26.1%	30.5%	56.5%	0.7%	1.8%	7.0%
Lower initial past credit	34.7%	26.1%	31.5%	58.7%	0.7%	1.9%	6.9%
Higher initial past credit	36.0%	26.1%	33.1%	59.8%	0.7%	2.2%	7.1%

Table AIV. 3 IKA demographic projections under the lower mortality sensitivity test, 2005-2055

Year	Number of contributors*	Number of pensioners			Total number of pensioners	Ratio of contributors to pensioners
		Old-age	Invalidity	Survivors		
2005	2,355,971	557,715	134,571	247,580	939,866	2.51
2006	2,397,061	565,893	137,700	248,990	952,583	2.52
2007	2,440,648	573,991	140,824	250,264	965,079	2.53
2008	2,479,273	581,777	144,060	251,448	977,285	2.54
2009	2,528,422	589,505	147,434	252,654	989,593	2.56
2010	2,571,605	597,417	150,985	253,860	1,002,262	2.57
2011	2,610,332	605,764	154,810	255,126	1,015,700	2.57
2012	2,644,908	614,654	158,862	256,384	1,029,900	2.57
2013	2,677,085	624,148	163,154	257,814	1,045,116	2.56
2014	2,708,536	634,225	167,666	259,242	1,061,133	2.55
2015	2,739,278	644,964	172,375	260,535	1,077,874	2.54
2025	2,768,381	794,694	232,133	271,806	1,298,633	2.13
2035	2,714,251	917,829	270,498	274,580	1,462,907	1.86
2045	2,384,056	1,454,761	377,546	312,985	2,145,292	1.11
2055	2,254,391	1,628,140	400,905	382,105	2,411,150	0.93

Table AIV. 4 IKA benefit expenditure projections by benefit category under the lower mortality sensitivity test, 2005-2055 (millions)

Year	Pensions, grants & benefits				Benefits (PAYG)	Benefits
	Old-age	Invalidity	Survivors'	Total	(% insurable earnings)	(% of GDP)
2005	4,534	842	1,316	6,692	26.1	3.79
2006	4,850	904	1,384	7,138	26.1	3.81
2007	5,190	970	1,454	7,614	26.1	3.84
2008	5,475	1,026	1,505	8,006	25.9	3.86
2009	5,777	1,086	1,559	8,422	25.7	3.88
2010	6,099	1,151	1,615	8,865	25.6	3.92
2011	6,445	1,220	1,675	9,340	25.6	3.96
2012	6,817	1,295	1,737	9,849	25.6	4.01
2013	7,218	1,376	1,802	10,396	25.7	4.06
2014	7,648	1,463	1,871	10,982	25.7	4.11
2015	8,111	1,555	1,942	11,608	25.8	4.16
2025	15,036	2,929	2,867	20,832	29.9	5.25
2035	29,095	5,572	4,314	38,981	39.8	7.33
2045	54,555	9,573	6,880	71,008	56.5	10.18
2055	83,827	14,075	11,198	109,100	63.3	11.59

Table AIV. 5 IKA financial projections under the lower mortality sensitivity test, 2005-2055 (millions)

Year	Revenue from contribution (A)	Benefit expenditure (B)	Annual deficit (A)-(B)	Annual deficit (% of GDP)
2005	5,380	6,691	-1,311	0.74
2006	5,732	7,138	-1,406	0.75
2007	6,113	7,614	-1,501	0.76
2008	6,485	8,007	-1,522	0.73
2009	6,870	8,423	-1,553	0.71
2010	7,241	8,865	-1,624	0.72
2011	7,632	9,340	-1,708	0.72
2012	8,039	9,849	-1,810	0.74
2013	8,463	10,397	-1,934	0.76
2014	8,916	10,982	-2,066	0.77
2015	9,401	11,609	-2,208	0.79
2025	14,535	20,832	-6,297	1.59
2035	20,485	38,980	-18,495	3.48
2045	26,270	71,008	-44,738	6.41
2055	35,997	109,100	-73,103	7.77

Appendix V Peer review statement

The Social Security Department of the International Labour Organization (ILO) has been appointed by the Greek National Actuarial Authority (NAA) to undertake actuarial valuations of the 12 largest public pension schemes of Greece. A senior actuary has been appointed to review the work done by the ILO actuarial staff for the valuation of two major schemes known as IKA and OGA. IKA covers all private sector employees whilst OGA is the pension scheme for agricultural workers. This report describes the nature of the work done by the actuary performing the peer review of the actuarial valuation and highlights key findings.

Scope of the review

The objective of the peer review was to ensure the data used is sufficient and reliable and the methodology and assumptions used in the forecast of demographic and financial results are appropriate. The peer review has been performed in a few steps during the completion of the actuarial valuation by ILO. The peer reviewer provided guidance and approval as necessary in the selection of major orientations to be followed in the modelling process.

Since no translation of the Greek legislation was available in the official ILO languages, actuaries relied on the description of benefits provided by the NAA as a summary of the legislation prevailing at the valuation date. A review of the communications between ILO and NAA indicates that there is no risk of material error in the description of the provisions of the schemes for which demographic and financial projections were made. The reviewer could also rely on direct communications with the NAA staff.

Data

Data requests were submitted by ILO to NAA, who was responsible for the collection of data from public statistical agencies and pension scheme administrators. NAA had no direct access to operational data bases of the pension schemes and had to process their own requests through their statistical agency. NAA staff made follow-ups with that statistical agency and the pension administrators in order to ensure proper completion of requests and full understanding of data.

Due to certain limitations of the pension schemes database especially, the full set of data could not be made available. This had an impact on the degree of uncertainty regarding the determination of certain assumptions. Some input data regarding the participants at the valuation date do not fully reflect their current characteristics but this was corrected through proper calibration of the model. This was possible due to indications obtained from consistency checks between various sets of data that are known to be accurate.

In accordance with the NAA request, the determination of demographic and economic assumptions relied on data provided by the European Union Ageing Working Group (AWG). In this respect, the peer review consisted in comparing the data provided by NAA with the one shown in official reports and in analyzing the techniques used in the replication of AWG assumptions when the variables developed by the AWG were not as detailed as required by the ILO projection model. ILO made tests in order to comment the appropriateness of using AWE assumptions to assess the long term financial sustainability of pension schemes.

Methods and Assumptions

Adjustments to the ILO generic model have been exhaustively reviewed and it is reasonable to conclude that they properly reflect the provisions of the schemes such as described by NAA. The examination of the projection formulas remained at a general level and even though it did not cover all detailed calculations, it was exhaustive enough to ensure that any remaining inaccuracy would have a minor impact on results.

Scheme-specific assumptions are based on the recent experience of IKA and OGA as much as possible. They have been determined on the best-estimate approach, which implies there is no margin for adverse deviations. Examination of the AWG assumptions used in the determination of the demographic and economic framework leads to the conclusion that they are appropriate to assess the long-term financial sustainability of pension schemes, subject to the following comments regarding the mortality rates. The recent experience of pensioners would suggest lower mortality rates than those used in the baseline scenario, but the ILO view on the best-estimate assumption is properly reported in the sensitivity analysis.

Conclusion

According to the reviewer, the financial projections of IKA and OGA pension schemes made by ILO rely on sufficient and reliable data and appropriate methods and assumptions. It is worth noticing that improvements in the data base are highly desirable in order to reduce the degree of uncertainty of financial projections.

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