Original Article

The distinction between basic pension and contributory pension: The paradoxes of the recent reform to the Greek pension scheme (Laws 3863 and 3865/2010)

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ABSTRACT Greece under severe financial and economic crisis has accepted the control of the World Monetary Fund and the European Union. Among other measures imposed on Greece is government funding to remain at 5 per cent of the GDP until 2030. In order to fulfill this obligation, Laws 3863 and 3865/2010 have been passed. With these laws, the distinction between basic pension and contributory pension is introduced. A theoretical mathematical model based on social security principles for calculating the aggregate pension (basic pension and contributory pension) is presented and compared to the model that corresponds to the recent reform to the Greek pension scheme. Apart from the social and economic merits of this reform, some paradoxes and shortcomings are pointed out.

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THE FRAMEWORK OF SOCIAL INSURANCE REFORM

With Laws 3863/2010 and 3865/2010, Greece has taken drastic measures to enhance the sustainability of the pension scheme and maintain the adequacy of pensions.^{1,2,3} Social reaction was rather moderate compared to the past. Greek society, under the pressure of a potential state bankruptcy, accepted what had been rejected in

the past, in the hope that the worst can be avoided. The applicable actuarial projections⁴ show that, were it not for these radical changes, in 2040 24.1 per cent of the GDP would be required for pensions instead of the current 11.4 per cent, 5 per cent of which comes from the state budget and 6.4 per cent from contributions and social taxes to fund a number of social insurance organizations.

The explanatory report of Law 3863/2010 states clearly that the aim is for government funding to remain at 5 per cent of the GDP until 2030. In view of the fact that the number of pensioners is expected to rise, whereas

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government funds remain at the same level, it is obvious that reform of the social insurance scheme is in essence to reduce pension expenditure or/and increased revenue. Laws 3863 and 3865/2010 mostly adopt provisions that limit the entitlement to a pension (reduced pensions, increased retirement age limits, extended contributions record required in order to qualify for pension) as, on the one hand, social insurance contributions are already high and, on the other, the high fiscal deficit makes any discussion on pensions being funded by the state sound unrealistic. What the legislator aims, at least, is for this 'poverty allocation' – because this is what it really is – to be implemented fairly. In some cases, the law succeeds in doing so, whereas in others inequalities and distortions are caused (see below), which must be rectified in the future.

The Greek pension scheme derives its primary features from the Bismarck model; however, the manner in which it was implemented systematically ignored fundamental principles of the model, for example that benefits are determined in connection with contributions and are based on actuarial projections. In the course of time, the legislator proved to be extremely generous to groups of the population that lacked sufficient qualifying time and had not paid contributions that could finance the pensions awarded to them. This occurred because, with regard to the pensions awarded, there had been no actuarial projections or any respective provisions set up on how these would be funded. A typical example is that full pension was granted to women with only 15 qualifying years required, irrespective of an age limit, or with a low retirement age limit, when it was obvious that on the one hand a population group perfectly capable of working would be removed from workforce disabled, and on the other their contributions would not be sufficient enough to finance their pensions, given that they had paid contributions for 15 years, whereas they would receive pension for more than 45 years (life expectancy for women is 82 years). These and many other provisions of similar nature led society to believe that social insurance means

that social insurance organizations – being funded by contributions and, in any event, by the government – pay benefits irrespective of the contributions paid by each insured person throughout his/her working life. The want of a contributory principle and the resulting lack of social insurance awareness on the part of employees led to high rates of employees working without any social insurance or employees insured for less time than they actually work or at lower remuneration than they are actually paid. Therefore, boosting the contributory element of the pension scheme and raising the awareness of employees in terms of social insurance is crucial to combating uninsured employment and enhancing the sustainability of the pension scheme.

Pensions are calculated based on a mathematic formula that takes into account the following factors: pensionable earnings (ΣA),⁵ contributions record⁶ and replacement ratio.⁷ The state pension replacement ratios for contributions records up to 31 December 2010 are, with regard to persons affiliated to social insurance organization until 31 December 1992, 77 per cent over pensionable earnings (ΣA) and, with regard to persons affiliated to social insurance organization after 1 January 1993, 70 per cent over ΣA . The mathematic formula in the case of an insured person paid on the basis of working days (HE) is $2 \text{ per cent} \times (\text{HE} : 300) \times \Sigma A$, whereas in the case of an insured person paid on the basis of qualifying years (EA) is $2 \text{ per cent} \times \text{EA} \times \Sigma A$.

It is asserted, particularly by the Greek General Confederation of Labor (GSEE), that because pensionable earnings and, in general, salaries are low in Greece, this high replacement ratio fails, in practice, to result to high pensions. In 2005, 64 per cent of IKA-ETAM pensioners (IKA-ETAM is the Social Insurance Institute for private employees) received pensions of up to €599⁸ and the situation has yet to improve. However, it must be taken into account that the state pension replacement ratio is boosted with the supplementary pension replacement ratio, and as a result the aggregate ratio is somewhat higher.

Greece is going through extremely hard times in terms of economic, fiscal and, as a result, social

conditions. Already, there is a recession and a dramatic increase in unemployment rates. Therefore, state intervention is necessary in order for a minimum income that ensures a decent level of living to be guaranteed and social tensions to be avoided. To date, the state funded and granted the following social assistance benefits to insured persons, based on income criteria: (a) minimum pensions, that is, the difference between payable pension and minimum pension required for a decent standard of living. The minimum monthly pension in 2010 was €605, (b) the Social Solidarity Benefit (EKAS) to pensioners with an income lower than the statutory limit. In addition, the state granted funds and the Agricultural Insurance Organization (OGA) awarded a pension of €360 to uninsured persons over the age 65 years.

On the basis of these facts and connected to the objectives of adequacy and sustainability, the contribution of the recent pension reform will be evaluated below – in particular, the distinction between basic pension and contributory pension. With regard to this distinction, a theoretical model is developed, which places particular emphasis on the provision of incentives to people in order to obtain social insurance, given that uninsured employment plagues the Greek scheme (II). Subsequently, the recent pension reform is presented and commented upon (III). Finally, the pension reform model is compared with the theoretical model for the purpose of demonstrating the paradoxes of this reform and the distortions that need to be rectified (IV).

A THEORETICAL MODEL FOR THE DISTINCTION BETWEEN BASIC PENSION AND CONTRIBUTORY PENSION⁹

Objectives – principles

Pension is calculated based on the contributions paid by the insured person throughout his/her working life (*contributory pension*).¹⁰ In the event that the pension is lower than a statutory threshold (*reference pension*), it is supplemented by the state (*basic pension*). This supplement paid by the state is a social assistance benefit to be

awarded under certain conditions (age limit, income criteria). The amount of basic pension varies depending on the contributions that insured persons have paid for their social insurance. Hence, persons who have worked more receive a higher pension amount compared to persons who have worked for a shorter time or not at all. However, even persons who have not worked at all are entitled, provided that certain age and income requirements are met, to a *minimum pension* in the form of a minimum social assistance benefit. Government funding for pensions that are below the statutory threshold is calculated based on the objective criteria, outlined below, namely in accordance with the principles of equality, social solidarity and justice.

Pension calculation method (see Appendix 1A for further analysis of the mathematic formula)

1. In the event that the amount of the contributory pension is equal to or higher than the reference pension, the pension equals the contributory pension.
2. In the event that the amount of contributory pension is lower than the reference pension, the pension consists of the sum of two parts, namely contributory pension plus basic pension. Basic pension is calculated by the formula:

$$\text{Basic Pension} = a \times (\text{reference pension} - \text{contributory pension})$$
The multiplicative factor (a) is a solidarity rate ranging between 0 and 1. The values between 0 and 1 are determined based on the implementation of an appropriate social policy. Therefore, basic pension is not a constant amount but depends on the amount of contributory pension (see in detail and with examples Appendix A).
3. The pension for the uninsured, which is to be awarded to persons with zero working days = $(a) \times (\text{reference pension})$.

According to the foregoing process:

1. A high reference pension means high pension replacement, whereas a low reference pension means low pension replacement. If, for

example, the reference pension is €500, then all contributory pensions lower than €500 shall be supplemented by the State according to the above mathematic formulas. If the reference pension is €700, then all pensions below this amount shall be supplemented by the State, which calls for higher state expenditure.

2. If the solidarity rate is close to 0, then the government policy focuses on the contributory nature of pensions and, as such, pensions are almost completely contributory. If, by contrast, the government policy focuses on solidarity and a is close to 1, solidarity prevails almost entirely and all pensions below are raised to the level of the reference pension. Both of these extreme versions (0 and 1) do not serve the objective of balancing solidarity with the contributory principle; therefore, the solidarity rate should be fixed at an in-between value.

It is obvious that basic pension decreases when contributory pension increases – however, in a way that aggregate pension constantly increases as contributory pension increases. As a result, this provides incentives for people to obtain social insurance at work and continue working. Thus, this calculation method allows the State to implement a proper social policy and determine government funding for the pension scheme at a higher or lower level in accordance with its economic situation and social priorities. In addition, according to a variation of this model, persons who qualify for pension equaling the reference pension receive an additional amount, as depicted in the chart in the Appendix B, so that there is an extra incentive for at least attaining the minimum level of qualifying time. However, when the final reference pension (increased by an amount as incentive) is too high as compared to the initial reference pension, it can lead to distortions.

The model described above can be further adjusted in connection with secondary objectives that may be set by the government policy. As such, it is an extremely flexible and transparent tool for the implementation of pension policy.

PENSION REFORM AND THE DISTINCTION BETWEEN BASIC PENSION AND CONTRIBUTORY PENSION

Principles – definitions

The recent reform has reevaluated the correlation between contributions and benefits (contributory principle), the association of social assistance with social insurance and the connection with pension readjustment based on demographic and development data. The government funds will remain at the same levels at least until 2015, by which time it is assumed that the areas that are as yet only indirectly deduced from the law will be specified. That is, that government funding will be gradually limited to basic state pension, certain social assistance benefits and extraordinary funding.

- (a) *Contributory pension* is defined in Article 1, part 2 of Law 3863/2010 as the pension amount that is corresponding to the amount of social insurance contributions for the qualifying years as of 1 January 2011 and thereafter with regard to any insured person who qualifies for pension as of 1 January 2015 onward, with such pension amount being paid by social insurance organizations or the State to the people with a contributions record that is greater than 1 year.

Contributory pension is calculated as follows: There are 10 classifications of days worked (HE), and for each class there is a replacement ratio over Pensionable Earnings (ΣA), starting from 0.80 per cent for 1 HE to 4500 HE and increasing gradually to 1.50 per cent for 11 701 – 15 000 HE. Monthly ΣA equals the aggregate remuneration of the working life for which contributions were paid, without taking into account Christmas, Easter and holiday bonuses, divided by the months of employment of an insured person in this period. Pensionable Earnings (ΣA) have taken into account the percentage change in the Consumer Price Index and with a rate of wage drift determined on an annual basis through a joint decision of the Ministers

of Finance and Employment and Social Insurance taking into account the opinion of the National Actuarial Authority and the National Statistical Service of Greece. In Greece, there is no available information on the contributions paid by each insured person and when there actually is some information – for example in IKA-ETAM, this information only spans over the past decade. Pensionable Earnings (ΣA) are calculated based on applicable social insurance contribution classes, with a proportional application of the formula above.

How the specific replacement ratios have been determined derives either from the law's explanatory report or ILOs' Technical Report to the National Actuarial Authority, entitled '*Consolidated financial development of the Greek pension scheme*', 2008–2060 of 22 June 2010, which was submitted before the Greek Parliament. It is possible that replacement ratios arise based on the very limited financial and actuarial capabilities of social insurance organizations. In addition, the rates for the preretirement indexation of yearly earnings will be determined by virtue of a Ministerial Decision.

- (b) *Basic pension* is defined in Article 1, part 1 of Law 3863/2010 as a pension that is not associated with contributions in contrast with contributory pension. On the one hand, it is paid to insured persons with 4500 or more working days or 15 or more qualifying years, without income criteria at the time of exit and, on the other, to insured parties with 1 to 15 qualifying years or 4500 working days and to uninsured parties,¹¹ based on income criteria, at their 65th year of age. Basic pension is funded by the state budget.¹² The amount of the basic pension is €360, which, until the application of this law, has been the amount of the social assistance pension granted to uninsured over-aged persons by OGA for many years. With regard to reduced pensions, the basic pension is reduced by 1/200 for each month remaining until full retirement age attained. With regard

to disability pensions, the basic pension rate is determined according to the degree of disability.

The scheme introduced by Law 3683/2010 is depicted in the following chart

The black line depicts the pension (Σ) as a function of the contributory pension (A) where Γ = contributory pension for 15 qualifying years or 4500 working days.

The pension arises as follows:

- In the event that the contributory pension is lower than Γ , it is supplemented until it reaches the amount of €360, provided that the beneficiary is at least 65 years old and that the requirements set based on income criteria are met. This is illustrated in the chart with line segment $\Delta \Theta$.
- In the event that the contributory pension is higher than Γ , at the time of exit (not necessarily 65 years of age), without income criteria, it is supplemented with the basic pension of €360. This is illustrated in the chart with line segment EH.

Two paradoxes are identified

First paradox: The basic state pension, which is funded through taxation, is awarded based on income criteria to uninsured persons and persons with a contributions record of up to 4500 working days or 15 qualifying years, whereas it is

also awarded, without income criteria, to insured persons with a longer contributions record who, by objective standards, enjoy a higher income and, as such, are in less need of protection.

The reasoning behind granting the basic pension to all the people who qualify for pension irrespective of income criteria, which is adopted by the legislator, tries in essence to give an answer to the criticisms of trade union organizations, in particular, the GSEE, which claims that contributory pensions are low and the state is responsible for the '*absence of social capital and the failure of subsidizing, albeit in part, the social insurance scheme disbursements from the returns on social capital ...*'.¹³ On the other hand, there is a failure to recognize that the purpose of social insurance is to protect all insured persons – primarily, those who do not qualify for pension, but in a way, however, that gives incentives to people in order to obtain social insurance and qualify for pension.

Second paradox: Every concept of the contributory principle is contravened as the pension of insured persons, in particular low-paid employees, with 15 qualifying years or 4500 working days is subsidized with a much higher percentage rate as compared to workers with high contributions through taxation, without income criteria. As a result, persons with 15 qualifying years or 4500 working days have low motivation in terms of staying in work and, at the same time, high motivation to report salaries lower than their actual salaries. In order to demonstrate how the contributory principle is contravened by the pension scheme introduced with the pension reform, we will compare the pensions arising after 35 qualifying years and

15 qualifying years with regard to employees (a) who became affiliated to social insurance organizations before 31 December 1992, (b) who became affiliated to social insurance organizations after 1 January 1993 and (c) who will become affiliated to social insurance organizations after 1 January 2011 (Laws 3863 and 3865/2010). It is pointed out that for contributions records before 31 October 2010, the pre-reform scheme applies, whereas for contributions records after 1 January 2011 the new scheme shall apply. A reference period of 35 qualifying years is chosen because until 2010 this was the period that entitled people to full pension. In order for the differences to become clear, the comparison is made based on low earnings (€1000), average earnings (€1800) and high earnings (€3500).

The following arise from Tables 1 and 2:

- On the basis of the pension reform (Table 2), the aggregate replacement ratio for insured persons with 35 qualifying years ranges from 56.13 per cent to 81.85 per cent. Insured people with higher earnings are awarded lower rates. In the case of 15 qualifying years, the aggregate replacement ratio ranges from 22.28 per cent to 48 per cent. Again insured people with higher earnings are awarded lower rates. By contrast, with regard to persons affiliated before 31 December 1992 and persons affiliated after 1 January 1993 (Table 1), a single replacement ratio applies for the same number of qualifying years, irrespective of the amount of pensionable earnings. For example, it is 70 per cent for persons affiliated before 31 December 1992 with 35 qualifying years, irrespective of whether their earnings amount to €1000, €1800 or €3500.

Table 1: Scheme for the persons affiliated to social insurance organizations up to 31 December 1992 and after 1 January 1993

Qualifying years	Pensionable earnings	Person affiliated before 31 December 1992	Replacement ratio (%)	Person affiliated after 1 January 1993	Replacement ratio (%)
35	€1000	€770	77	€700	70
35	€1800	€1386	77	€1260	70
35	€3500	€2695	77	€2450	70
15	€1000	€330	33	€300	30
15	€1800	€594	33	€540	30
15	€3500	€1155	33	€1050	30

Table 2: Scheme introduced with the pension reform

<i>Qualifying years</i>	<i>Pensionable earnings</i>	<i>Contributory pension</i>	<i>Replacement ratio (%)</i>	<i>Basic pension</i>	<i>Aggregate pension</i>	<i>Aggregate replacement ratio (%)</i>
35	€1000	€458.5	1.31	€360	€818.5	81.85
35	€1800	€825.3	1.31	€360	€1185.3	65.85
35	€3500	€1604	1.31	€360	€1964.7	56.13
15	€1000	€120	0.8	€360	€480	48
15	€1800	€216	0.8	€360	€576	32
15	€3500	€420	0.8	€360	€780	22.28

- In the scheme introduced with the pension reform, pension is the sum of contributory pension and basic pension. The contributory pension correctly adopts the – applicable to date – single replacement ratio for the same number of qualifying years, irrespective of the amount of pensionable earnings. Indicatively, for 35 qualifying years, the replacement ratio is 1.31 per cent irrespective of whether pensionable earnings are €1000 or €1800 or €3500. However, as the basic pension increases contributory pensions in a uniform manner, specifically by €360, insured persons with higher earnings (and, as a result, higher contributions) are eventually awarded lower pensions (lower aggregate replacement ratio) compared with insured persons with lower contributions.

ASSESSMENT OF THE PENSION REFORM AS COMPARED TO THE THEORETICAL MODEL

The main differences between the pension reform and the theoretical model are as follows:

- The pension reform grants to all insured persons with a contributions record of more than 15 qualifying years or 4500 working days the basic pension as an increment to the contributory pension, whereas the theoretical model grants the basic pension based on income criteria, that is, provided that insured persons receive a contributory pension lower than the reference pension.
- According to the pension reform, the basic pension is €360 for all insured persons, with this amount remaining fixed in terms of the contributory pension; however, in the theoretical model, the basic pension amount, which applies only to pensions that are less than the reference pension, increases proportionally to the contribution pension amount and, as such, provides people with an incentive for staying in work.
- The theoretical model stipulates income criteria for awarding the basic pension. For the purpose of administrative cost savings, it can be stipulated that the basic pension will be paid by Tax Authorities in the form of a tax rebate, while social insurance organizations will be limited to awarding the contributory pension or the contributory part of the pension. Thus, on the one hand, what the state pays for the pension of each insured person and what is payable to each insured person based on their own contributions becomes clear. On the other hand, the rebate is granted taking into account the pensioner's aggregate income to which the basic pension is added. As a consequence, the basic pension amount depends on the beneficiary's income and is reduced on the basis of his/her total income and tax bracket, without any income criteria checks by social insurance organizations being required. In addition, a higher tax rate for basic pension income can be stipulated so that a 'quasi-redistribution' may take place among persons insured.
- According to the pension reform, these provisions shall apply after 2015, whereas the contributions records of persons affiliated to social insurance organizations before 31 December 1992 and persons affiliated after 1 January 1993 will be calculated until 2011

based on the previous pension scheme. Hence, inequalities among different groups of the population will remain. By contrast, based on the theoretical model, the above calculation of pensions shall apply to all insured persons who submit an application for retirement after a certain point in time that will be determined by law. In this manner, inequalities among different categories of persons, depending on the time of affiliation, and among different schemes, depending on the social insurance organization, will cease to apply. It is pointed out that despite the extensive consolidations of social insurance organizations, schemes have not been consolidated, and as a result organizations apply different social insurance legislation for different groups of persons affiliated to them. However, it is not unlikely that further transitional provisions shall apply within the scope of achieving a smooth transition from the previous scheme to the new one.

The defects of pension reform with regard to the distinction between contributory and basic pension are as follows:

- (a) The basic pension is not scaled up or down proportionally to the amount of the contributory pension of persons who do not qualify for pension so that the aggregate pension can increase proportionally to the increase in the contributory pension and, as such, provide incentive for social insurance.
- (b) The basic pension practically results in contravening the contributory principle with regard to pensions for a contributions record equal to or higher than 15 qualifying years or 4500 working days. Hence, people are motivated to lie about their true income and socially inequitable solutions result.

Assuming that basic pension is a social assistance benefit, it should be awarded based on income criteria, and pensioners' income of any nature should have been taken into account, for

example, rents. The law fails to do this with regard to pensioners with more than 15 qualifying years or 4500 working days. As a result, an insured person with pensionable earnings of €1000 and a contributions record of 35 qualifying years receives a pension with an 81.85 per cent replacement ratio for €1000, notwithstanding any other income this person may have, for example, rents amounting to €50 000 per annum. On the other hand, an insured person with pensionable earnings of €3500 and a contributions record of 35 qualifying years receives a pension with a 56.13 per cent replacement ratio for €3500 even if this person has no additional income. Thus, basic pension, in spite of the law's assertions, lacks a true social assistance nature for persons with a contributions record of more than 15 years, and fails to serve the social assistance concept.

Assuming, however, that basic pension is a social insurance benefit, the lack of being scaled up or down in terms of the contributory pension is not consistent with its nature as it contravenes the contributory principle and equalizes different categories of insured persons. In the name of solidarity, some restrictions to the contributory principle are permitted; however, when solidarity is subsidized through taxation, the aggregate income of insured persons should be taken into account – which is not currently the case in terms of the basic pension of persons with a contributions record of more than 15 qualifying years or 4500 working days – so that everyone contributes proportionally to lifting state burdens and receives benefits according to their needs, as stated in the Constitution.

At any rate, accepting that low pensions are subsidized by higher pensions would be the same as accepting that the salaries of high-salaried employees subsidize the salaries of low-salaried employees. To date, this is not the case in the labor field, and thus why this could be the case in the social insurance field is beyond comprehension. Low pensions should, of course, improve, yet primarily through taxation and based on income criteria. The primary means for wealth redistribution should be taxation and then follows social insurance. It is not unlikely that

measures will be taken in favor of persons receiving low pensions on the basis of solidarity within a group of insured persons, for example, a pension ceiling; however, these measures should not result in contravening the contributory principle, blunting people's resolve to support social insurance, unequal treatment and disproportional burdens for those who have paid higher contributions.

CONCLUSIONS

The concept of making a distinction between basic pension and contributory pension may have a positive outcome on the sustainability of the Greek pension scheme. Despite the fact that it was adopted under enormous economic pressure and leads to a reduction in the pension replacement ratio, it attempts to do so in a socially equitable way, by protecting the most vulnerable groups of the population. However, there is always the danger that it might not achieve its objectives, as the basic pension, as instituted by the law, undermines the contributory principle.

The above theoretical model can serve as a basis for the enhancement of the scheme as it is a flexible and transparent method for implementing desirable social policy from time to time, given that the legislator is able to determine the reference pension and the solidarity rate and introduce additional requirements for social insurance. In addition, this model specifies the scope of collective and individual responsibility, provides incentives for social insurance and improves conditions for persons insured who do not qualify for pension. Finally, it is a method that is easy to implement as, upon calculation of the contributory pension by the social insurance organization and provided that the contributory pension is lower than the reference pension, all it takes is a mathematical formula and a PC automatically calculates the basic pension and the pension in aggregate.

The positive results in terms of pension adequacy and scheme sustainability will be greater if the theoretical model is combined with a new architectural structure of the scheme in connection with the role of supplementary

pension and occupational retirement pension,¹⁴ and the introduction, in part, of the funded pension scheme or the quasi-funded pension scheme (for example, calculation of retirement points and so on).

REFERENCES AND NOTES

- 1 'Basic' state pension is a pension funded by the state budget (through taxation) and granted by social insurance organizations. Instead of 'basic', the terms 'social' or 'national' could be used, which refer directly to national social solidarity.
- 2 'Contributory' pension is the pension awarded according to the contributions that were paid throughout the entire duration or part of a person's working life at net present value in correlation with pensionable age and upon deduction of the operating expenses of social insurance organizations.
- 3 Law 3863/2010 pertains to all persons insured except for civil servants. Law 3865/2010 pertains to civil servants.
- 4 These are the actuarial projections developed by the National Actuarial Authority (NAA), based on ILO standards, in connection with IKA-ETAM (Social Insurance Institute-Supplementary Pension Fund for Private Employees), the Insurance Organization for the Self-Employed (OAEE), the State and the Agricultural Insurance Organization (OGA), that is, at a percentage corresponding to approximately 4/5 of the scheme. However, there had been previous projections such as that made by British Actuaries. The time span of these projections is until 2030 and the validity of their findings has been confirmed over time. The aforementioned projections have been published on the website of the Association for the Protection of Social Rights (EPKODI) on <http://www.epkodi.gr>.
- 5 'Private employees' ΣΑ for contributions records up to 31 December 2010 reflect the total earnings for which contributions have been paid (except for Christmas or Easter or holiday bonuses) in the last 5-year period before applying for pension benefits.
- 6 The contributions record is calculated in qualifying years (EA) or working days (HE) (300 HE per annum).
- 7 The replacement ratio is calculated over pensionable earnings (ΣΑ), which, as aforementioned, refer to the last 5-year period before retirement and, as such, they do not reflect all the contributions that the insured person has paid in.
- 8 Labor Institute of GSEE, 'Actuarial projection for IKA-ETAM' by S. Rombolis, G. Romanias, V. Margios and I. Hatzivasileiou, 2005, page 14.
- 9 Proposed by the author to the Committee for Social Dialogue on the social insurance reform where the writer was a member, upon request of the Ministry of Employment and Social Insurance.
- 10 In Greece, there is no available information on the contributions paid by each insured person and when there actually is some information, for example, in IKA-ETAM, this information only spans over the past decade. In the initial application of the law, as there is no complete information available, pension can be calculated on the basis of the contributions paid in the last 10 years before retirement.
- 11 The law has received positive evaluation as regards the fact that it establishes contributory pension for insured parties with less

than 4,500 working days or less than 15 qualifying years but more than one qualifying year. To date, these insured persons were treated similarly to uninsured persons. In the name of solidarity, their contributions eventually funded the benefits for persons with more than 4,500 working days or 15 qualifying years. This new provision is extremely significant at a time when employees have a difficult time attaining the contributions record required in order to qualify for pension and, often, their working life is disrupted by interim periods of unemployment or underemployment. Employment instability is thus addressed at a satisfactory level.

- 12 With the exception of two social security organizations (ETAA and ETAP-MME).
- 13 Labor Institute of GSEE, 'Actuarial projection of the social insurance scheme in Greece' LDSA (Laboratory of Demographic and Social Analyses) 2001, page 263. GSEE makes reference to the provisions of emergency law 1611/1950, pursuant to which Social Insurance Organizations were forced to deposit part of their reserves in the Bank of Greece at low interest rates. At the same time, however, when in need of borrowing, the loan rate was the market rate applicable from time to time. According to GSEE, as a result of these provisions, in 2000 the assets of the social insurance scheme amounted to approximately 5.6 trillion GDR whereas without the restrictions of the said law – according to GSEE's estimates – these assets would amount to approximately 20 trillion GDR.
- 14 A. Anagnostou – Dedouli in her article 'Social Insurance Reform=New social insurance scheme' (in Greek) that was published on the website of the Association for the Protection of Social Rights (EPKODI), <http://www.epkodi.gr>.

APPENDIX A

Further analysis of the theoretical model

Definitions

- Contributory pension (A) means the pension to which an insured person is entitled depending on the social insurance contributions paid by that person throughout his/her entire working life (or, in terms of the initial application of the law, the contributions paid for *part* of his/her working life) at Net Present Value in correlation with his/her age on the date of exit and upon deduction of operating and other expenses of the social insurance organization.
- Reference pension means the cash amount defined by law as a threshold under which the state supplements contributory pension. Reference pension shall be designated hereinafter by the letter (P).
- Basic pension (B) means a social assistance supplement paid by the state in the event that

the contributory pension is lower than the reference pension (P).

- Pension (Σ) means

Either the contributory pension in the event that the amount thereof exceeds the basic pension ($\Sigma = A$)

Or the sum of the contributory pension (A) plus the basic pension (B) in the event that the amount of the contributory pension is less than the reference pension (P). That is, $\Sigma = A + B$.

- Minimum pension means a cash amount that, *under certain conditions*, persons will receive from the state if their contributory pension is zero (safety net), that is, if they have not worked at all.
- The expenditure incurred by the state for the basic pension equals the difference between the pension minus the contributory pension ($B = \Sigma - A$).

The mathematic formula for pension calculation

- In the event that the amount of the contributory pension (A) is equal to or higher than the reference pension (P), the pension (Σ) equals the contributory pension.
When $A > P$, then $\Sigma = A$
- In the event that the amount of the contributory pension (A) is lower than the reference pension (P), the pension (Σ) consists of the sum of two parts, namely the contributory pension (A) plus the basic pension (B). Namely, $\Sigma = A + B$.

The amount of the basic pension is determined with the formula $B = a(P - A)$ where (a) is a solidarity rate ranging between 0 and 1. The values between 0 and 1 are determined based on the implementation of an appropriate social policy.

- If $a = 0$, then $B = 0$ and the pension is purely contributory.
- If $a = 1$, then $B = (P - A)$; therefore $\Sigma = A + B = P$, meaning that the pension is

the same for everyone, that is, it equals P for everyone, irrespective of the working life timespan of each insured person. Hence, pension (Σ), which is the sum of contributory and basic pension, equals $\Sigma = A + B$, and as $B = a(P - A)\Sigma$ can be depicted with the mathematic formula $\Sigma = aP + (1 - a\alpha)A$.

The pension for the uninsured that is to be awarded to persons with zero working days ($A = 0$) is aP .

The theoretical model is depicted as follows in the chart

A = Contributory pension; B = Basic pension;
 P = Reference pension (for example, An amount of €600); a = solidarity rate; Σ = Aggregate pension

This chart (the black line) shows how pension (Σ) is derived as a function of the contributory pension (A) and the reference pension (P).

According to this process

- A high reference pension (P) means high pension replacement, whereas a low reference pension (P) means low pension replacement.
- If the solidarity rate is close to 0, then the government policy focuses on the contributory nature of pensions and, as such, pensions are virtually contributory. If, by contrast, the government policy focuses on solidarity and α is close to 1, solidarity prevails almost entirely and all pensions below P are raised to the level of the reference pension (P). Both of these extreme versions (0 and 1) do not serve the objective

of balancing solidarity with the contributory principle; therefore, the solidarity rate should be fixed at an in-between value.

Examples of how to calculate pension when the contributory pension is lower than the reference pension

- Example with a solidarity rate of $a = 0.50$ and a reference pension of (P) = €600
 - Given that the insured person is entitled to a contributory pension (A) of €300, then he/she shall receive a pension (Σ) = $0.50 \times €300 + (0.50) \times €600 = €450$.
 - Given that the insured person is entitled to a contributory pension (A) of €500, then $\Sigma = 0.50 \times €500 + 0.50 \times €600 = €550$.
 - Persons who have not worked at all ($A = 0$) will receive the minimum pension, which is €300 ($0.50 \times €600$).
- Example with a solidarity rate of (a) = 0.50 and a reference pension of (P) = €700
 - Given that an insured person is entitled to a contributory pension of €300, then $\Sigma = 0.5 \times €300 + 0.5 \times €700 = €500$.
 - Given that an insured person is entitled to a contributory pension of €500, then $\Sigma = 0.50 \times €500 + 0.50 \times €700 = €600$.
 - Persons who have not worked at all will receive the minimum pension, which is €350 ($0.50 \times €700$).
- Example with a solidarity rate of (a) = 0.45 and reference pension of (P) = €800
 - Given that an insured person is entitled to a contributory pension of €300, then $\Sigma = 0.45 \times €800 + 0.55 \times €300 = €525$.
 - Given that an insured person is entitled to a contributory pension of €500, then $\Sigma = 0.45 \times €800 + 0.55 \times €500 = €635$.
 - Persons who have not worked at all will receive the minimum pension, which is €360 ($€800 \times 0.45$).

The foregoing model can be further adjusted in connection with secondary objectives that may be set by the government policy. As such, it is an extremely flexible and transparent tool for the implementation of pension policy.

APPENDIX B

A variation of the theoretical model

The basic pension is increased by an amount as incentive for people to continue working

$P1$ = The reference pension increased by an amount as incentive for people to continue working and qualify for pension; a = solidarity rate; Σ = aggregate pension; the black line indicates how pension is derived as a function of the contributory pension (A).