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To: Members of the Executive Board

From: The Secretary

Subject: **Greece—Selected Issue—An Overview of Pension Reform**

This paper provides background information to the staff report on the 2001 Article IV consultation discussions with Greece (SM/02/32, 2/1/02), which is tentatively scheduled for discussion on Friday, February 22, 2002. At the time of circulation of this paper to the Board, the Secretary's Department has received a communication from the authorities of Greece indicating that they consent to the Fund's publication of this paper.

Questions may be referred to Mr. Lutz (ext. 36588).

Unless the Documents Section (ext. 36760) is otherwise notified, the document will be transmitted, in accordance with the procedures approved by the Executive Board and with the appropriate deletions, to the WTO Secretariat on Friday, February 15, 2002; and to the European Commission, the Food and Agriculture Organization, and the Organisation for Economic Cooperation and Development, following its consideration by the Executive Board.

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INTERNATIONAL MONETARY FUND

GREECE

**Selected Issue—An Overview of Pension Reform**

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Approved by the European I Department

February 7, 2002

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## **I. INTRODUCTION**

1. Greece will face in the coming decades one of the most adverse demographic trends among advanced economies. In contrast with many other countries, the Greek pension system has not undergone a fundamental reform over the past decade. Following the successful adoption of a “mini” reform package of measures in the late 1990s, the government in Spring 2001 began discussions with social partners on fundamental pension reforms. A labor union-sponsored pension reform conference last fall also highlighted the need for reforms, and suggested that a consensus was emerging on several components. The government aims for an agreement among social partners, and to approve reform legislation during 2002. This remains all the more urgent as the public debt burden is equivalent to almost 100 percent of GDP and, in the absence of pension reforms, the fiscal accounts are expected to be confronted by the largest increase in aging-related expenditure pressures among European Union economies.

2. This paper provides an overview of the public pension system in Greece, and of prospective pension-related spending pressures, and considers some policy options. Section II reviews the structure of Greece’s pension system, discusses reforms adopted in the early and late 1990s, and compares some basic parameters of the Greek pension system (e.g., retirement ages, replacement rates and the indexation system) with those of other European Union economies. The section ends with an overview of demographic projections for Greece in an international context. Section III discusses pension expenditure projections and, following the European Commission (EC, 2001) and Dang and others (2001), allocates the projected changes in pension spending that result from changes in the old-age dependency ratio, the employment ratio, the benefit ratio, and the eligibility ratio. Section IV examines the sensitivity of the expenditure projections to variations in demographic and macroeconomic assumptions, including those relating to the rate of productivity growth. Section V considers some policy reform options, and Section VI provides conclusions.

## **II. BACKGROUND, PREVIOUS REFORMS, AND DEMOGRAPHIC OUTLOOK**

### **A. Background**

3. Greece’s public pension system is characterized by an exceptional degree of complexity.<sup>1</sup> There are over two hundred funds providing primary and supplementary pensions, as well as separation payments. Pension benefit rules and levels differ among the various funds. Practically 100 percent of the population is covered by this system. The three largest primary funds, which cover retirement, disability and survivor pensions, are: IKA, the Social Insurance Institute, covering private sector wage earners; TEBE, covering non-agricultural self-employed individuals; and OGA, which covers farmers. There are over 20 other more specialized primary funds, covering particular professions (e.g., lawyers,

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<sup>1</sup> Private pensions schemes are all but nonexistent in Greece (OECD 2001).

doctors, and engineers), while the state budget directly provides for civil servants' pensions. Employees in public enterprises and state-owned banks have enterprise-specific funds.<sup>2</sup>

4. The large number of (over 200) supplementary funds exists to top up the generally low levels of primary pensions (although high in comparison to contributions). Many primary funds have corresponding supplementary funds, but their memberships do not fully match. The largest surplus fund is run by IKA, called IKA-TEAM. Separation funds, which provide a one-off payment upon retirement, cover smaller groups of pensioners, including public employees, lawyers and doctors, although more recently, funds covering a few groups of private sector employees have been created.

5. While a number of funds (especially supplementary and separation funds) have annual surpluses, and have accumulated assets totaling about 12 percent of GDP, the main primary funds have significant operating deficits, which are covered by budgetary transfers and earmarked taxes.<sup>3</sup> The pension system is effectively operated on a "pay-as-you-go" basis. The shortcomings of this structure in the face of adverse demographic developments are well known.<sup>4</sup> But these have been compounded in Greece by eligibility conditions, which were loosened in the late 1970s and early 1980s, (to essentially universal coverage, without comparable increases in contributions), combined with generous pension benefits relative to contributions. This has fostered incentives for early retirement, contribution evasion and other abuses of the system, abetted by weak administration and the system's complexity.<sup>5</sup>

6. Following the extension of pension eligibility and benefits in the previous decade (including to immigrants of Greek origin and members of national resistance), by the early 1990s pension benefits were excessively generous relative to contributions. Minimum

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<sup>2</sup> In 2000, there were 2.47 million pensions, although this number overstates the number of pensioners because some individuals receive multiple pensions. IKA accounted for 36.8 percent of this total, OGA for 36.1 percent, TEBE for 5.8 percent, the public sector (civil servants and state-owned enterprise employees) for 9.7 percent, with the remaining 11.6 percent of pensions covered by other primary funds (Government of Greece, 2001a).

<sup>3</sup> In 1998, the latest year for which detailed data are available, the supplementary and separation funds recorded surpluses of Dr 170.8 billion (0.5 percent of GDP) and Dr 49.2 billion (0.1 percent of GDP), respectively, while the primary funds had a combined deficit of Dr 1.14 trillion (3.2 percent of GDP), excluding budgetary transfers and earmarked taxes (Government of Greece, 2001a). On a national accounts basis, the social security sector had a consolidated surplus of 2.4 percent of GDP in 2000, including transfers from other government sectors of 5.6 percent of GDP and earmarked taxes of 0.4 percent of GDP.

<sup>4</sup> See, for example, Chand and Jaeger (1996).

<sup>5</sup> These shortcomings are discussed in some detail in OECD (1997).

pensions increased sharply as a share of average wages in the late 1970s and early 1980s.<sup>6</sup> This, combined with a relatively short minimum contribution period (of only 13½ years), created strong incentives for early retirement.<sup>7</sup> Incentives to evade contributions also existed. Private employee pensions were based on earnings over only the last two years of employment, creating a bias to underreport income for earlier years. A regressive replacement rate schedule also provided an incentive to underreport earnings (and thus contributions). The same incentives existed for the self-employed, who placed themselves in lower, self-selected, income contribution classes, but received primary pension broadly comparable to those from IKA. Prior to 1998, farmers were not required to make pension contributions, although their primary pensions were relatively low. In contrast, civil servants also made no contributions, but received among the most generous pensions and the possibility of retiring at earlier ages compared to private sector employees. Public enterprise and state-owned bank employees also enjoyed among the most generous pensions and liberal retirement ages, although there was little possibility for contribution evasion.<sup>8</sup>

## **B. Previous Reforms**

7. In response to a rapidly worsening financial position, Greece initiated reforms to its pension system in 1990–92. A distinction was made between those in the workforce prior to, and those entering the workforce after, 1992, with a unified, less generous, system created for the latter group.<sup>9</sup> For those already working, contributions were introduced (for civil

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<sup>6</sup> The pension base was broadened to include Christmas, Easter, and holiday bonuses in 1978, effectively raising pensions by 16.6 percent. The minimum pension was raised to 80 percent of the minimum blue-collar wage from 60 percent, and the minimum wage itself was raised by 50 percent in 1982 (OECD, 1997).

<sup>7</sup> The OECD reported that the share of IKA-provided pensions based on the minimum eligibility period increased steadily from about 9 percent in 1975 to almost 20 percent in 1990. By the mid-1990s, some 70 percent of the stock of all pensions were at the minimum pension (OECD, 1997).

<sup>8</sup> Civil servant and public sector pensions were more generous than their private sector counterparts in part because their pension base was the last month's salary. As a result, the average replacement rate for primary and supplementary pensions was in excess of 100 percent of average wages. Moreover, civil servants receive a lump-sum (nontaxable) separation payment equivalent to two years of salary (for 25 years of work). The relatively handsome public sector pensions, and total remuneration package, has been argued to have depressed private sector employment, boosted workers' reservation wages, thereby contributing to a rise in unemployment (Demekas and Kontolemis, 1996; and Lutz, 2001).

<sup>9</sup> Among the major provisions applying to all post-1992 labor market entrants, the retirement age was set at 65 years. The replacement rate was set at 80 percent for combined primary and supplementary pensions, and the pension base was extended to five years. Employer and

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servants) or increased, a progressive tax was levied on high pensions, replacement rates were to be gradually lowered (with limits on the total value of all pensions), minimum contribution periods were extended (to 15 from 13½ years), and public sector minimum pensionable ages were gradually raised. The most important change affecting existing private employee pensioners was a shift from indexing primary pensions from minimum wage increases to increases in civil servants' pensions. Given that civil servants' wage and pension increases were kept purposefully low to moderate inflation, this resulted in a decline in average primary pensions' real value over 1990–95 by over 20 percent.<sup>10</sup> This, however, proved not sustainable, and in 1996 the link was shifted to consumer prices, while providing a means-tested supplement to low income pensioners above 65 years of age. Subsequently, the indexation base was again changed for IKA pensioners to increases in civil servants' pensions, which in turn were linked to increases in civil servants' wages.

8. Despite these efforts, the 1990–92 measures were of a stopgap nature. Pensions continued to be overly generous compared with contributions in actuarial terms, even for new labor market entrants. Moreover, the supposed surplus of the pension system was more than accounted for by budget transfers, and pension funds collected earmarked taxes that often had no clear economic link to specific funds, and, moreover, contributed to a fragmented tax system.

9. In the late 1990s, the government committed itself to fundamentally reforming the pension system, in order to place it on a sustainable basis. In light of a “window of opportunity” given by a relative dearth of new pensioners until about 2010, the government intended to approach the reform effort in two steps.<sup>11</sup> The first consisted of a number of additional, relatively minor, measures designed to improve the governance of the existing pension system, reduce administrative burdens, and improve the yields on funds' assets. The second step was to undertake more fundamental reforms. Among the more important measures included in the first step was the introduction in 1997 of compulsory contributions by farmers, with the state still providing two-thirds of total contributions. Beginning in 1998, the government also began a process of “regularizing” previously illegal foreign workers,

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employee contribution rates were not changed (with the employer paying 13.33 percentage points of wages, and the employee 6.67 percentage points for the primary pension, and 3 percentage points paid by each for supplementary pensions), but the government now contributed 10 percentage points as well. Spouse and child dependency allowances were trimmed, survivor pensions became means tested and pensions were reduced or eliminated for those simultaneously working.

<sup>10</sup> OECD (1997).

<sup>11</sup> The window resulted from the combined effects of the 1990–92 reforms, and a marked reduction in the number of individuals reaching retirement age because of low fertility rates experienced during the 1940s.

issuing working permits, and requiring them and their employers to make pension contributions.<sup>12</sup> As part of the first, or “small” reform package of 1998–99, a number of additional measures were adopted. This included the consolidation, unification or abolition of more than 60 funds, further measures to discourage early retirement, and to combat contribution evasion.

10. Nevertheless, the Greek pension system remains in a parlous state. From an international perspective, the average old age retirement age is low (Table 1). Replacement rates in Greece, especially for pre-1992 labor force participants, vary widely, while those for post-1992 entrants are among the highest (at 80 percent, including supplementary pensions, Table 2). This is even more the case considering that the base upon which the pension is based is as short as the last month of work for pre-1992 public sector employees, and is still only the last five years for all post-1992 labor market entrants. Given that wage structures tend to be progressive, pension benefits in Greece are likely higher in relation to lifetime contributions than is the case in pension systems in which pensions are based on lifetime earnings. As regards indexation, primary pensions for state sector employees are linked to increases in civil servant wages (while private sector minimum pensions are adjusted in line with civil servant pensions, and those for the self-employed and professionals are increased on an ad hoc basis). Eight other EU economies (Austria, Belgium, Finland, France, Ireland, the Netherlands, Portugal, and Sweden) index their pensions to a mix of wages and prices, or adjust them on some other ad hoc method. Two EU economies (Denmark and Germany) generally link their pensions to wage increases, while four others (Italy, Luxembourg, Spain, and the United Kingdom) tie their pension increases to prices.<sup>13</sup> In comparing pension expenditure projections, the choice of indexation clearly has a significant bearing on pension expenditure projections.

### **C. Demographic Outlook**

11. Greece presently has an old-age dependency ratio (defined for international comparability as those aged 65 and older as a share of those aged 20–64) above the EU average. It should be noted, however, that data from the recently completed decennial population census, which were not available at the time of these projections, suggest that previous estimates of relatively young economic migrants were substantially underestimated and, if integrated into the economy in general and pension system in particular, could improve the latter’s prospects (although with implications for other government

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<sup>12</sup> By April 2000, 90,000 immigrants had been registered by IKA, an additional 90,000 by OGA, and 20,000 by TEBE. However, the number of workers that initially applied for guest worker status was about 225,000, while some estimates of the total number of economic immigrants totals 650,000, which would exceed 10 percent of the labor force (Bank of Greece, 2000).

<sup>13</sup> European Commission (2000).

expenditures, notably health and education, Figure 1).<sup>14</sup> In addition to its relatively high initial dependency ratio, Greece is also projected to have the fourth most rapidly growing dependency ratio in the EU (trailing only Spain, Italy, and Austria), and is projected to have the third highest average by 2050 (European Commission, 2001).<sup>15</sup> This reflects both a growing number of people of retirement age, and, as importantly, an absolute decline of the number of individuals of working ages (due to low fertility rates). Thus, even ignoring the shortcomings of the pension system outlined above, Greece is expected to face above average pension expenditure pressures.

### III. PENSION EXPENDITURE PROJECTIONS AND THEIR DETERMINANTS

12. Greece presently has among the highest pension expenditures in the EU (Table 3). This reflects the already high old age dependency ratio, the low effective retirement age and long life spans, and the sharp increases in pension eligibility in the 1980s. It is projected to experience by far the highest increase in pension expenditures (relative to GDP) in the next half century. Differences in the treatment of pension indexation overstates somewhat the increase in Greece's pension expenditures relative to some other economies, but the increase would still be higher than in other countries even if Greece's pensions were indexed only to inflation.<sup>16</sup> Other countries experiencing large increases include Spain, the Netherlands, and Portugal. Only in the United Kingdom are pension expenditures projected to decline.

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<sup>14</sup> Demographic projections were provided by Eurostat, and based on central demographic projections, including a broad increase in and convergence of life expectancies and fertility rates, and "reasonable" assumptions about annual net migrant flows. The recently completed decennial census indicates that the population was 10.9 million in 2001, compared to only 10.5 million previously estimated, and thus potentially overstating Greece's comparatively poor demographic prospects.

<sup>15</sup> In light of Greece's relatively low retirement age (and low youth participation rates, see Lutz, 2001), its effective dependency ratio is even higher.

<sup>16</sup> The projections included in Table 3 were produced by national authorities (or by others under contract to the national authorities, as was the case in Greece), using country specific models to reflect individual institutional details. The project was jointly undertaken by the OECD and the Working Group on Ageing of the Economic Policy Committee of the European Union. As noted above for the EU economies, the projections employed Eurostat central demographic assumptions. In addition, similar assumptions were employed regarding rates of growth of labor force productivity (generally 1.75 percent per annum) and similar developments regarding labor force participation and unemployment (with a return to the OECD's estimate of the structural unemployment rate). See European Commission (2001) for more details regarding these assumptions. In projecting Greek pension expenditures, a working assumption of pensions increasing by one percent in real terms was used to broadly capture the fact that most (including IKA- and state-financed) pensions are indexed directly

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13. It is possible to allocate the projected expenditure increase among the separate influences of changes in the old-age dependency ratio, in the employment ratio, the benefit ratio (the average pension benefit relative to GDP per worker), and the eligibility ratio (the share of those at retirement ages that receive pensions, Table 4).<sup>17</sup> It is not surprising that the contribution from the rise in the old-age dependency ratio in Greece is among the highest in the EU. The sizable negative contribution from the employment ratio reflects an assumed rise in the participation rate in Greece (especially of women) toward levels broadly seen already in non-Mediterranean EU economies (similar magnitudes are projected for Italy and Spain). As with the dependency ratio, the contribution attributed to the eligibility ratio in Greece is also among the highest in the EU. This reflects a number of factors, including: the retirement with pensions (including supplementary pensions and separation payments) by individuals in sectors that previously were not covered by the pension system; and the eventual rising share of pensioners among those of retirement age resulting from projected increases in participation rates and reduction in unemployment rates.<sup>18</sup>

14. One area in which Greece is clearly an outlier among EU economies regards the projected rise in the benefit ratio. While, with the exception of the Netherlands, the benefit ratio in other EU economies is either constant or declining, it accounts for almost one-third of the projected increase in old-age pension spending in Greece. A decline in this ratio would be expected in systems with growing labor productivity and pensions indexed to prices (Italy, Luxembourg, Spain, and the United Kingdom), or not fully linked to real wages. It would appear that the rise in the Greek benefit ratio reflects two developments. The first is the maturation of separation payment schemes, which were more recently introduced and have become more widely available. Secondly, there are some notable shifts in the composition of pension recipients (Table 5). It is projected that the share of disability pensions among total pensions would decline in the coming decades. As these receive relatively lower payments,

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or indirectly to civil servants wages, although others (including those for the self-employed) are not. Estimates for other economies that index their pensions to wages, notably Denmark and Germany, abstracts from this feature, thereby understating the degree to which pension expenditures are set to rise and overstating the differences in the comparative increase in Greek expenditures. Nevertheless, including the indexation feature in the Greek projections results in a more accurate assessment of the scale of reforms necessary to place the system on a sustainable basis.

<sup>17</sup> See the annex to Dang, Antolin, and Oxley (2001) for details regarding construction of the components. The numbers in the last four columns are log-linear estimates of the overall change in the second column, and thus may not sum completely due to rounding.

<sup>18</sup> Recall that in Greece, data are available for the number of pensions, rather than the number of pensioners. Thus, to the extent that a growing proportion of individuals of retirement age that receive primary pensions begin also to receive supplementary pensions and/or separation payments, the rise in the actual eligibility ratio may be overstated.

the average pension should be expected to rise. Similarly, the share of farmers' pensions (OGA) among total pensions is also projected to decline. As OGA pensions are on average significantly lower than other types of pensions, this would also be expected to raise the effective average pension.

#### IV. SENSITIVITY OF PENSION PROJECTIONS

15. By their very nature, long-term pension expenditure projections are subject to a large degree of uncertainty. While life expectancy projections are relatively less uncertain, those for fertility rates and migration are subject to greater variability. In addition, pension costs will be sensitive to change in various macroeconomic variables (labor force participation and unemployment rates, as well as projected labor productivity growth). The European Commission asked its member states to explore pension costs under a scenario consistent with the conclusions of the Lisbon Summit (the "Lisbon scenario").<sup>19</sup> Concretely, labor force participation rates were presumed to gradually converge to 83 percent by 2045 (which would imply significant increases in female participation rates in some economies, including Greece). Unemployment rates were projected to decline to 4 percent by 2045. Demographic projections were taken from the Eurostat "high" population growth scenario.<sup>20</sup>

16. Pension expenditure projections under the "Lisbon scenario" are presented in Table 6, while differences with the baseline scenario are included in Table 7. With the exception of the United Kingdom, where pension expenditure shares were already projected to decline, expenditure shares continue to rise in all reporting economies. Also, Greece continues to record the largest projected increase, although by 8.2 percentage points of GDP, compared to 12.2 under the baseline scenario.<sup>21</sup> Seven economies, including Greece, are still projected to experience increases in pension expenditures of at least 3 percentage points of GDP (compared with 11 economies under the baseline scenario). Thus, while the improved macroeconomic performance under the "Lisbon scenario" goes some way in reducing

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<sup>19</sup> This includes a "goal for full employment", and an increase "in the employment rate from an average of 61 percent today to as close as possible to 70 percent by 2010 and to increase the number of women in employment from an average of 51 percent today to more than 60 percent by 2010." (European Union 2000).

<sup>20</sup> This variant assumes a higher fertility rate and life expectancy. Thus, while the overall population is higher than in the central variant, there is relatively little variation in the structure of the population, and therefore does not allow for a sufficient variation in pension expenditures as shares of GDP. For this reason, the Greek study also explored the sensitivity of pension spending to alternate demographic projections.

<sup>21</sup> As not all members followed precisely the "Lisbon" assumptions outlined above, intercountry comparisons should be treated cautiously when examining both scenarios.

pension burdens, additional reforms appear to be necessary to ensure that pension spending pressures do not undermine the long-term sustainability of the public finances.

17. It is also useful to examine the relative sensitivity of the projections to variations in different parameters individually. As seen in Figure 2 and discussed below, the projections are most sensitive to variations in demographic variables, and less so to changes in macroeconomic parameters.<sup>22</sup> However, even under the more optimistic demographic scenario, the ratio of the population of working age to those of retirement age falls by 50 percent (from 3:1 to 2:1), compared to a halving under the central scenario, and the share of pension expenditures still rises by 7½ percentage points of GDP before beginning to fall back.

18. Pension expenditure projections are found to be less sensitive to changes in macroeconomic parameters. This is because over projection periods as long as those considered here, initial beneficial (detrimental) impacts of changes are largely offset once the affected cohorts eventually retire. Thus, while an increase in the male participation rate by 3 percentage points and by about 7 percentage points for females initially boosts output, thereby reducing the pension expenditure share, eventually the larger number of workers retire, providing an upward impetus to the spending share. The same applies to variations in the unemployment rate.

19. As regards an increase in the productivity growth rate (by ¼ percentage point per year), it also boosts output more than pension spending initially, but eventually implies higher real pension levels once the more productive (and more highly compensated) workers retire. However, the size of the variation considered here is relatively small, and larger persistent increases in this variable, which would be an outcome of a convergence in real living standards in Greece with its EU partners, could have a sizable beneficial impact on the pension expenditure share.<sup>23</sup> Nevertheless, the pension expenditure share would still rise by at least 4 or more percentage points of GDP by 2050.

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<sup>22</sup> The demographic variants examined here were designed to alter the relative population structures to a larger degree than those contained in the corresponding Eurostat variants. The “old” variant combines a smaller increase in the fertility rate and a larger increase in life expectancy than in the central projection, thereby creating more of a “mushroom” shape in the population age profile. The “young” variant combines a larger rise in the fertility rate and smaller increases in life expectations, and therefore less of a “mushroom” pattern.

<sup>23</sup> On a purchasing power adjusted basis, Greece’s per capita income is about two-thirds of the EU average. If the latter’s labor productivity was assumed to grow at 1¾ percent per annum, Greece’s productivity would have to grow by 2.6 percent to have the same living standard by 2050. This growth differential is about three times that shown in Figure 2. Thus, on a rough basis (recognizing that the projections are not linear), this productivity growth rate would lower the increase in the pension expenditure share to about 21 percent of GDP in

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20. The sensitivity to the level of indexation has a somewhat larger and more permanent impact, as it affects the numerator of the expenditure share without affecting the denominator, an issue returned to in the next section.

## V. SOME POLICY OPTIONS

21. We have seen that in the Greek context, following macroeconomic policies and undertaking structural reforms that would enable the economy to operate consistent with the “Lisbon scenario” would be insufficient to reduce the pension expenditure share sufficiently to forestall the need for fundamental reforms to the pension system. In fact, even if productivity were to grow at a pace sufficient to align Greek and EU living standards by 2025 (with the former far exceeding the latter by 2050), the pension expenditure share would still rise to about 16 percent of GDP. Thus, the pension system itself must be reformed to ensure that the public finances remain sustainable over the long run.

22. One possible option for improving the pension system’s financial position would be through increased contribution rates. However, Greece total tax wedge on labor, that is the difference between employer’s total labor costs (including employer-paid social insurance contributions) and the net amount received by employees (less employee-paid social insurance contributions and income taxes), already exceeds the Euro area and EU averages (European Commission, 1999). The Greek government’s report (2001b) estimates that in the absence of reforms to the pension system, and were the government’s contributions to remain fixed at its current share of GDP (at almost 5 percent), contributions would have to double by 2050 to finance future expenditures. Clearly, this could sharply reduce potential growth. Thus, reforms to pension expenditures should also be considered. This section considers two possible types of reforms as contained in the government’s report (2001b). The first is “parametric” in nature, adjusting particular numbers or rates, while largely maintaining the existing system. The second is structural in nature, shifting from a full pay-as-you-go system toward some multi-pillar, or partly funded system. It should be noted that these reform examples are but a few of many possibilities, and are chosen merely for illustrative purposes.

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2050. In fact, Greece has averaged labor productivity growth of about 3 percent annually in the second half of the 1990s (with GDP growth of  $3\frac{1}{3}$  percent, and employment growth of  $\frac{1}{3}$  percent). Were productivity to rise to  $3\frac{1}{2}$  percent annually, while remaining at  $1\frac{3}{4}$  percent in the EU on average, living standards would be equalized by 2025, and the pension expenditure share would rise to only about 16 percent of GDP in 2050 (a still sizable increase).

### **A. Parametric Reforms<sup>24</sup>**

23. There are an infinite number of combinations of the various parameters of the present system, including changes in the retirement rate, the pension accrual rate, the pension base, and the degree of real pension indexation. This section considers the relative sensitivity of pension expenditure shares to variations of these parameters separately, while the implications of changes in combinations of them can be inferred on a very gross basis (Figure 3).<sup>25</sup> The top two panels consider four changes in retirement ages. The first two raise the retirement age to 67 years, applying either to post-1992 labor market entrants, or to all workers under age 50 (while assuming that those over age 50 and close to retirement are not affected). While the option including all workers less than fifty has superior financial implications during 2005–2040 (with correspondingly better implications for government debt), the two options are identical at the end of the projection period. Both reduce the government's burden by increasing years of contributions and reducing years of receiving pensions. Nevertheless, in both cases the government's pension burden increases substantially. Were the retirement age raised to 70 years, the total increase in the annual burden to the government would be limited to slightly more than 4 percentage points of GDP, with in fact lower burdens until around 2030 if the higher retirement age applied to all those under 50 years of age.

24. Two options are considered regarding pension levels. First, the basic pension replacement rate for pre-1992 labor market participants could be reduced to that available to post-1992 labor market entrants. This basically accelerates the transition to the new system, but has little impact on the government's burden. The second does not affect the pre-1993 workers, but instead lowers the maximum primary pension for post-1992 workers to 40 percent of the average salary. This also provides little relief to the government's burden until the latter years of the projection, when the post-1992 workers begin retiring.

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<sup>24</sup> It should also be borne in mind that these scenarios are also “static” in nature, in that they assume that individual behavior regarding labor force participation and retirement ages are not affected by parametric changes in the pension system. Thus, they may understate savings that could be obtained were pension reforms able to, for example, reduce the share of individuals that retire with minimum pensions.

<sup>25</sup> Figures 3 and 4 display the governments' pension burden, which differs from total pension expenditure shares shown in previous figures, as it is net of employer and employee contributions and investment income (net of administrative expenditures). It assumes for simplicity that the government covers all pension sector shortfalls. This method was chosen, rather than comparing differences in total pension expenditures, to allow for comparisons when changes in contribution rates, including under the structural reform alternatives, are considered.

25. Another option would be to include a larger number of years in the base period for determining pensions. The middle-right panel of Figure 3 examines a shift to include all contribution years in determining pension levels.<sup>26</sup> The question then becomes whether to scale up contributions from earlier years in the pension base by inflation or by nominal wage growth, or some intermediate combination, in determining pensions. Given an assumed positive growth in labor productivity, indexing old contributions by wage growth would result in higher pensions and a greater government burden.

26. The final panel of Figure 3 considers the implications of reforming the level of real wage indexation. The central projection assumes pensions are indexed at one percent above the inflation rate, reflecting that civil servants' wages and pensions are set to rise by less than average wages. Clearly, if the index were to increase to 2 percent above inflation (and also above the 1¾ percent real wage growth rate), the government's burden would rise even more substantially, while the increase would be moderated were pensions to be kept constant in real terms upon retirement.

27. It would appear that a combination of the parametric changes explored above could significantly limit or even halt the impact of demographic pressures on the government's pension burden under the present pay-as-you-go system. However, this would most likely require resorting an increase in the pension age, extending the pension base (which should have additional beneficial effects not captured here by reducing contribution evasion and incentives to retire early), and possibly modifying the post-retirement indexation system. Alternately, more fundamental structural changes to the system could be considered.

## **B. Structural Reforms**

28. While the goals of all pensions systems are largely similar, there are numerous ways in which they can be attained.<sup>27</sup> This section considers three possibilities for illustrative purposes:<sup>28</sup>

- introduce a flat-rate pension proportionate to the contribution period but not dependent on earnings, combined with a reduced earnings-related pension;
- base the level of pensions upon retirement on actual contributions paid, allowing for changes in life expectancy;

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<sup>26</sup> This scenario does not include any reduced contribution evasion that may result from a shift to lifetime contributions in calculating the pension base.

<sup>27</sup> These issues are well covered in World Bank (1994).

<sup>28</sup> See Government of Greece (2001b).

- reduce the current pension and divert part of the contributions into individual savings accounts, while allowing for additional voluntary contributions.

29. Of course, each basic system suggested above could also include more detailed combinations of features considered in the previous subsection as well as others (e.g., adjustments to the survivor pension system), chosen to meet social goals within overall financial constraints. The scenarios included in Figure 4 are for illustrative purposes.

30. The first option considered assumes that the maximum flat rate pension of 20 percent of average wages, indexed to wages, is paid to those with 40 years of contributions. The earnings-related portion would reach a maximum of 30 percent of average wages also after 40 years (accruing at  $\frac{3}{4}$  percent per year), indexed after retirement to consumer price inflation. The flat rate pension would provide a higher replacement rate for workers with lower earnings, while the flat accrual rate would penalize early retirement compared to the current system. As for the transition period, it is assumed that supplementary pension would cease to exist, with the current contributions for these funds used to finance current pension costs, including already accrued supplementary pension benefits. The first panel of Figure 4 shows that this particular set of assumptions would reduce the government's pension burden by over 6 percentage points of GDP compared to the baseline scenario by 2050, although the remaining burden would still be more than twice its 2000 level.

31. A second option ties more closely eventual pensions to actual contributions, and to provide for future flexibility as circumstances (including retirement ages and life expectancies) change. One large advantage of this system is that it reduces contribution evasion and early retirement. This scheme need not involve the actual build up of funds for each contributor—rather “notional” individual accounts could be constructed, with “points” earned each year proportionate to contributions, and accumulated toward the eventual pension. It is also possible for these points to increase over time with a “rate of return,” dependent, for example on the economy's growth rate. The second panel of Figure 4 reflects the specific assumptions that: 75 percent of current contributions to primary and secondary pensions would be “invested” in the notional accounts;<sup>29</sup> that individuals would contribute for 40 years for a standard pension; and that pensions, once paid, would be increased by a rate one percent above inflation.<sup>30</sup> As a result, the increase in the government's pension burden is minimal, but pension incomes would also be far lower than they presently are, and would thus, most likely, need to be supplemented through other savings schemes.

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<sup>29</sup> While the total of the actual contributions would actually be used to pay current pensioners.

<sup>30</sup> A worker with 40 years of contributions and retiring at age 65 under this system would have a pension equivalent to about 30 percent of average earnings.

32. A third option would be to retain the current primary pension, but at a much reduced scale, while creating a fully funded supplementary pension system. Such a scheme would induce workers to take greater financial responsibility to provide for their later years, while creating a system that is more transparent, and therefore more flexible and sustainable. One simple example of such a system would be for the primary pension target to be 30 percent of average earnings (rather than 60 percent at present), to be earned after 40 years (rather than 35 years), with all contributions presently targeted for supplementary pensions placed in individual accounts (which could be used to purchase annuities upon retirement). The final pension would of course depend upon the rate of return (net of management fees) earned on the individual accounts.<sup>31</sup> As can be seen from in the bottom panel of Figure 4, there can be significant fiscal transition costs from such a system, as existing earned supplementary pension costs must be paid, but new supplementary contributions have been set aside in funded individual accounts. Only later, as the new lower primary pension replacement rates are phased in, would the overall costs of the new system be lower. In light of Greece's current debt burden, it is not clear if it would be feasible to shift to such a partly funded system as outlined here.

## VI. CONCLUSIONS

33. Greece is facing among the more dramatic demographic prospects in the coming decades. Moreover, current pension expenditures are among the highest of EU economies. Despite reforms at the beginning of the 1990s, and the "mini" reforms adopted late in the last decade, the public pension system remains excessively fragmented, exceedingly complex, and subject to abuse.

34. Recent improvements in economic management have raised the economy's growth potential in recent years, allowing for some long-delayed convergence in Greek living standards to those of its EU partners. Continued structural reforms, including in labor market performance, could further this process, with beneficial financial repercussions for the public pension system. In addition, a sharp upward revision of its estimated population in the recent census suggests that there are potentially more members, and contributors, to the pension system than thought before, although the task remains to integrate these workers into the system. Nevertheless, these developments by themselves most likely would be insufficient to place the system on a sustainable basis.

35. Thus, reforms to the various parameters of the current system, or of a more fundamental systemic nature, are necessary. As regards the former, current social insurance contribution rates are already relatively high, and further significant increases could harm potential growth prospects. It is thus likely that a combination of parameter changes

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<sup>31</sup> With 40 years of contributions, real net rates of return from 0–5 percent per annum would result in replacement rates of 39–54 percent, respectively.

concerning pension benefits, possibly including raising retirement ages, increasing the contribution period, adjusting replacement rates, increasing pension bases, and shifting the indexation system, are required. While not captured in the scenarios examined above, these reforms would most likely also improve contribution compliance and reduce pension years. Alternately, structural reforms, including introducing “notional” individual accounts, or even fully funded pillars to the pension system could be considered. However, careful consideration will need to be given to potential transition costs, in light of Greece’s presently high debt ratio. Regardless of the reforms ultimately chosen, the importance of introducing them as soon as feasible, especially given the long transition periods needed with such reforms, can not be overly stressed.

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Table 1. Greece: Average Retirement Age in 1998

	Old Age		Early Retirement	Disability
Belgium	62.6	1/	55.6	n.a.
Denmark	67.0		61.0	47.0
Germany	62.6	2/	...	51.6
Greece	60.7	3/	n.a.	51.4
Spain	65.3		60.9	50.3
France	61.8		n.a.	
Ireland	62.0	4/	n.a.	
Italy	61.4		55.6	50.5
Luxembourg	n.a.		n.a.	n.a.
Netherlands	65.0		60.0	n.a.
Austria	64.1		57.9	49.6
Portugal	65.8		n.a.	53.2
Finland 5/	65.4 (64.5)		60.4 (60.4)	49.1 (46.4)
Sweden	64.5		62.0	50.0
United Kingdom	n.a.		n.a.	n.a.

Source: Economic Policy Committee, European Commission (2000).

1/ Self-employed are not included (and pre-retirement is included under "early retirement").

2/ Data for general statutory pension scheme. Old age and early retirement combined.

3/ For women and men in the private sector. In the public sector the estimate is 55 years.

4/ For occupational pension schemes in 1995.

5/ Data for national pension scheme (in brackets: data for earnings-related pension schemes).

Table 2. Greece: Average Replacement Rate for Old-Age Pensioners, 1998

Belgium 1/	35.5
Denmark	56
Germany 2/	33
Greece 3/	20-109
Spain	65
France 4/	85+
Ireland	n.a.
Italy	53
Luxembourg	n.a.
Netherlands 5/	70
Austria	65
Portugal	n.a.
Finland 6/	50
Sweden	65
United Kingdom	n.a.

Sources: Economic Policy Committee, European Commission (2002); Government of Greece (2001c).

1/ Does not include self-employed.

2/ Old Bundeslander Statutory Pension Scheme, defined as the ratio between average first pension and average last wage for new beneficiaries in 1998. If another definition were to be used a different figure would result. The gross level of the standard pension (standard pension after 45 years of insurance/average earnings of all insured persons), for example was 48.5 percent in 1998.

3/ For pre-1993 labor market participants, 62 for private sector employees, 54 for the self-employed, 90 for professionals, 20 for farmers under the old system, 109 for public sector employees, and 80 for post-1992 entrants (including 20 for supplementary pension).

4/ For average earnings of non-executive employees in the private sector.

5/ Private sector employees. Fifty-four for the self employed, 90 for professionals, 109 for the public sector, and lower than 60 for the post-10,993 entrants.

6/ Data for earning-related pension scheme.

Table 3. Greece: Pension Expenditure Projections, 2000-50  
(In percent of GDP)

	2000	2010	2020	2030	2040	2050	Change 2000-Peak Year
Belgium	10.0	9.9	11.4	13.3	13.7	13.3	3.7
Denmark 1/	10.5	12.5	13.8	14.5	14.0	13.3	4.1
Germany	11.8	11.2	12.6	15.5	16.6	16.9	5.0
Greece	12.6	12.6	15.4	19.6	23.8	24.8	12.2
Spain	9.4	8.9	9.9	12.6	16.0	17.3	7.9
France	12.1	13.1	15.0	16.0	15.8	n.a.	4.0
Ireland 2/	4.6	5.0	6.7	7.6	8.3	9.0	4.4
Italy	13.8	13.9	14.8	15.7	15.7	14.1	2.1
Luxembourg	7.4	7.5	8.2	9.2	9.5	9.3	2.2
Netherlands	7.9	9.1	11.1	13.1	14.1	13.6	6.2
Austria	14.5	14.9	16.0	18.1	18.3	17.0	4.2
Portugal	9.8	11.8	13.1	13.6	13.8	13.2	4.1
Finland	11.3	11.6	12.9	14.9	16.0	15.9	4.7
Sweden	9.0	9.6	10.7	11.4	11.4	10.7	2.6
United Kingdom	5.5	5.1	4.9	5.2	5.0	4.4	-1.1
EU	10.4	10.4	11.5	13.0	13.6	13.3	3.2

Source: Economic Policy Committee, European Union (2001).

1/ Include the results of the semifunded labor market pension (ATP).

2/ Expressed as a share of GNP.

Table 4. Greece: Allocation of Changes in Old-Age Pension Spending, 2000-50  
(Level in percent of GDP; changes in percentage points)

	Total Old-Age Pension Spending, 2000	Change in Total Old- Age Pension Spending, 2000-2050	Contributions of:			
			Old-Age Dependency Ratio	Inverse of Employment Ratio	Benefit Ratio	Eligibility Ratio
Belgium	10.0	3.3	5.2	-0.9	-2.0	0.9
Denmark	10.5	2.8	4.1	-0.2	-1.7	0.5
Germany	11.8	5.0	6.2	-0.7	-2.7	2.0
Greece	12.6	12.2	9.9	-3.6	4.0	1.4
Spain	9.4	8.0	8.2	-2.4	-0.3	2.0
France	12.1	3.8	7.7	-0.9	-3.6	0.7
Ireland 1/	4.6	4.4	4.5	-0.9	-0.7	1.4
Italy	13.8	0.2	9.5	-3.1	-4.9	-1.4
Luxembourg	7.4	2.2	n.a.	n.a.	n.a.	n.a.
Netherlands	7.9	5.7	5.4	-0.6	0.2	0.5
Austria	14.5	2.5	10.5	-2.2	-2.9	-3.0
Portugal	9.8	3.4	6.7	-1.1	0.1	-2.4
Finland	11.3	4.7	6.6	-0.1	-0.1	-1.3
Sweden	9.0	1.7	3.9	-0.5	-2.6	0.8
United Kingdom	5.5	-1.1	2.4	0.0	-3.4	-0.1
EU	10.4	-0.2	6.4	-1.1	-2.8	0.6

Source: Economic Policy Committee, European Commission (2001).

1/ Percent of GNP.

Table 5. Greece: Projected Pensioners, 2000-50 1/  
(Share of total pensioners, unless otherwise noted)

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Old-age pensioners	66.7	65.9	65.9	66.7	68.7	69.7	71.0	71.9	72.7	72.8	72.7
IKA	21.1	22.5	24.1	25.9	28.2	29.9	31.5	32.8	34.0	34.8	35.2
OGA	25.8	24.2	22.8	21.3	20.0	18.7	17.4	16.2	15.1	14.0	13.2
TEBE	2.8	2.8	3.0	3.4	4.0	4.6	5.3	6.0	6.5	6.9	7.2
NAT	1.7	1.7	1.7	1.6	1.5	1.3	1.1	1.0	0.8	0.7	0.6
Public sector 2/	9.7	8.9	8.5	8.4	8.6	8.7	8.8	8.8	9.0	9.1	9.1
Other	5.6	5.7	5.8	6.1	6.4	6.6	6.9	7.1	7.3	7.4	7.4
Disability pensioners	17.4	16.2	14.9	13.9	12.2	12.3	11.8	11.3	10.8	10.4	10.1
IKA	6.6	6.1	5.8	5.5	4.4	5.2	5.3	5.3	5.2	5.1	5.1
OGA	9.2	8.4	7.6	6.8	6.2	5.6	5.1	4.7	4.4	4.0	3.8
TEBE	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7
NAT	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
Other	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Survivors pensioners	15.8	18.0	19.1	19.4	19.1	18.0	17.2	16.8	16.5	16.8	17.3
IKA	9.1	9.1	9.2	9.2	9.0	8.5	8.3	8.2	8.3	8.5	8.9
OGA	1.1	3.4	4.5	4.8	4.7	4.2	3.9	3.5	3.1	2.9	2.9
TEBE	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.1	2.2	2.3	2.5
NAT	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.3
Other	2.7	2.7	2.7	2.7	2.7	2.6	2.5	2.5	2.4	2.6	2.7
Total pensioners	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
IKA	36.8	37.7	39.1	40.6	41.7	43.6	45.0	46.3	47.5	48.4	49.1
OGA	36.1	36.1	34.9	32.9	30.9	28.5	26.5	24.4	22.6	21.0	19.8
TEBE	5.8	5.7	5.8	6.2	6.8	7.3	8.0	8.8	9.4	9.9	10.3
NAT	2.8	2.8	2.8	2.7	2.5	2.3	1.9	1.7	1.4	1.2	1.0
Public sector 2/	9.7	8.9	8.5	8.4	8.6	8.7	8.8	8.8	9.0	9.1	9.1
Other	8.8	8.9	9.0	9.2	9.5	9.6	9.8	10.0	10.2	10.4	10.6
Memorandum items:											
Pensioners/employed 3/	66.2	68.3	70.9	74.4	77.8	83.3	88.3	95.3	103.9	108.8	110.9
Pensioners/total population 3/	23.4	24.6	25.7	26.9	27.9	29.8	31.6	33.4	35.3	36.8	37.5

Source: Government of Greece (2001a); and Fund staff calculations.

1/ IKA—covers employees; OGA—covers farmers; TEBE—covers self-employed, and; NAT—covers seamen.

2/ Includes disability and survivors pensioners.

3/ May be overstated due to individuals with multiple pensions.

Table 6. Greece: "Lisbon Scenario" Pension Expenditure Projections, 2000-50  
(In percent of GDP)

	2000	2010	2020	2030	2040	2050	Change 2000-Peak Year
Belgium	9.9	8.4	9.5	11.0	11.3	11.1	1.5
Denmark	10.4	12.1	13.1	13.4	12.8	11.8	3.0
Germany	11.8	11.2	12.4	14.2	14.5	14.0	2.8
Greece	12.6	11.9	14.0	16.8	20.2	20.6	8.2
Spain	9.4	9.0	9.6	12.0	15.2	16.2	6.8
France	12.1	11.7	13.6	14.7	14.8	14.8	2.8
Ireland	4.6	5.5	6.7	7.4	8.3	8.2	3.7
Italy	13.8	13.4	13.9	14.4	14.5	14.4	0.9
Luxembourg	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Netherlands	7.9	9.2	11.5	13.3	13.9	13.4	6.0
Austria	14.5	14.4	14.7	15.8	15.2	13.5	1.4
Portugal	9.8	11.7	12.8	13.2	13.2	12.5	3.4
Finland	11.3	11.6	13.6	15.1	15.4	15.6	4.3
Sweden	9.0	9.2	10.0	10.4	10.4	9.9	1.6
United Kingdom	5.5	4.8	4.4	4.4	4.2	3.8	-1.7
EU	10.4	10.0	10.9	12.0	12.3	12.0	1.9

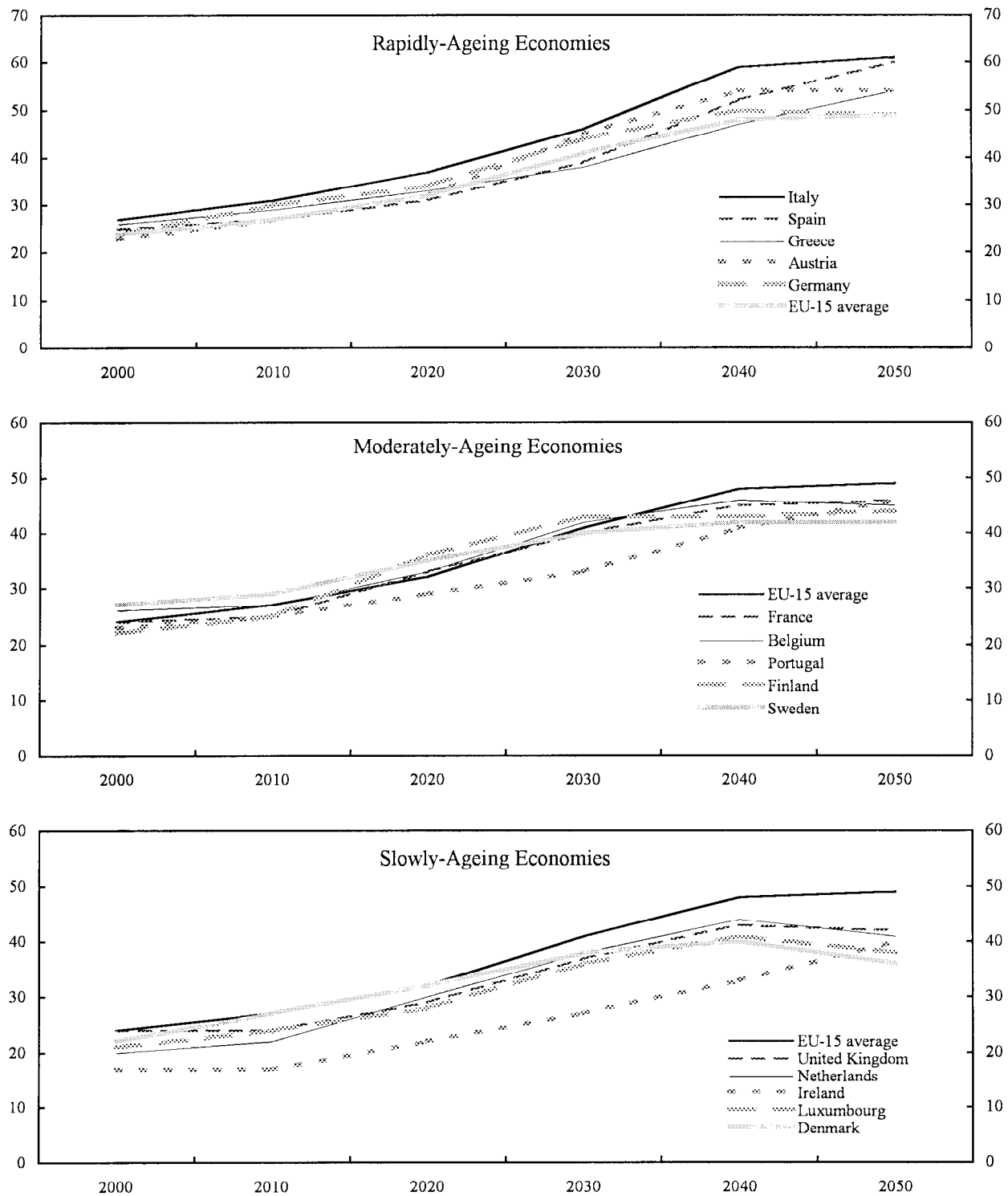
Source: Economic Policy Committee, European Commission (2001).

Table 7. Greece: "Lisbon Scenario" Less Baseline Pension Expenditure Projections, 2000-50  
(In percent of GDP)

	2000	2010	2020	2030	2040	2050	Change 2000-Peak Year	Percent Change 2000-Peak Year
Belgium	-0.1	-1.5	-1.9	-2.3	-2.4	-2.2	-2.2	-59.5
Denmark	-0.1	-0.4	-0.7	-1.1	-1.2	-1.5	-1.1	-26.8
Germany	0.0	0.0	-0.2	-1.3	-2.1	-2.9	-2.2	-44.0
Greece	0.0	-0.7	-1.4	-2.8	-3.6	-4.2	-4.0	-32.8
Spain	0.0	0.1	-0.3	-0.6	-0.8	-1.1	-1.1	-13.9
France	0.0	-1.4	-1.4	-1.3	-1.0	n.a.	n.a.	n.a.
Ireland	0.0	0.5	0.0	-0.2	0.0	-0.8	-0.7	-15.9
Italy	0.0	-0.5	-0.9	-1.3	-1.2	0.3	-1.2	-57.1
Luxembourg	n.a.	n.a.	n.a.	n.a.	n.a.	n.a. n.a.	n.a.	n.a.
Netherlands	0.0	0.1	0.4	0.2	-0.2	-0.2	-0.2	-3.2
Austria	0.0	-0.5	-1.3	-2.3	-3.1	-3.5	-2.8	-66.7
Portugal	0.0	-0.1	-0.3	-0.4	-0.6	-0.7	-0.7	-17.1
Finland	0.0	0.0	0.7	0.2	-0.6	-0.3	-0.4	-8.5
Sweden	0.0	-0.4	-0.7	-1.0	-1.0	-0.8	-1.0	-38.5
United Kingdom	0.0	-0.3	-0.5	-0.8	-0.8	-0.6	-0.6	54.5
EU	0.0	-0.4	-0.6	-1.0	-1.3	-1.3	-1.3	-40.6

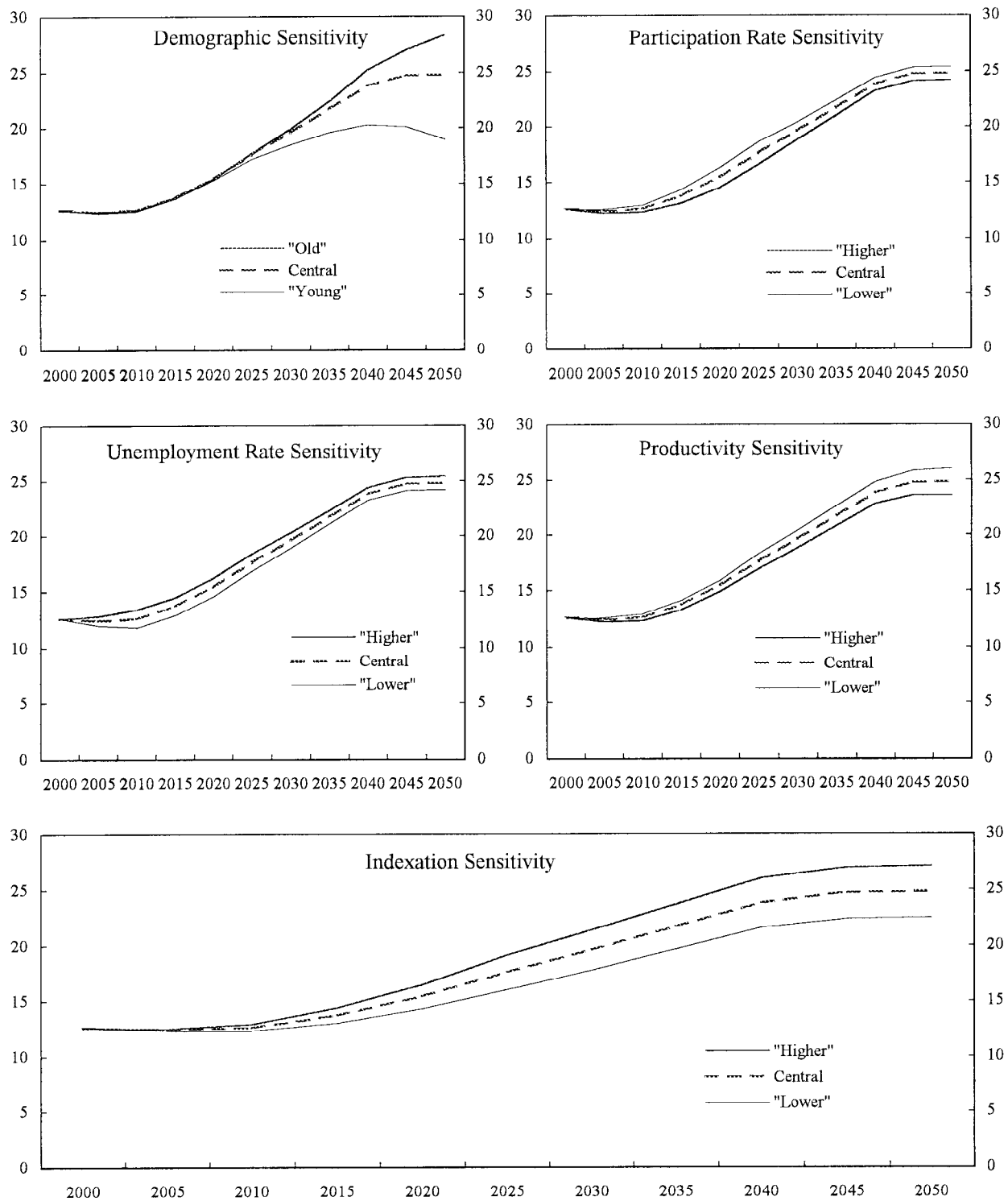
Sources: Economic Policy Committee, European Commission (2001); and Fund staff calculations.

Figure 1. Greece: Trends in Old-Age Dependency Ratios, 2000-50



Sources: Eurostat, as cited in Economic Policy Committee, European Commission (2001).

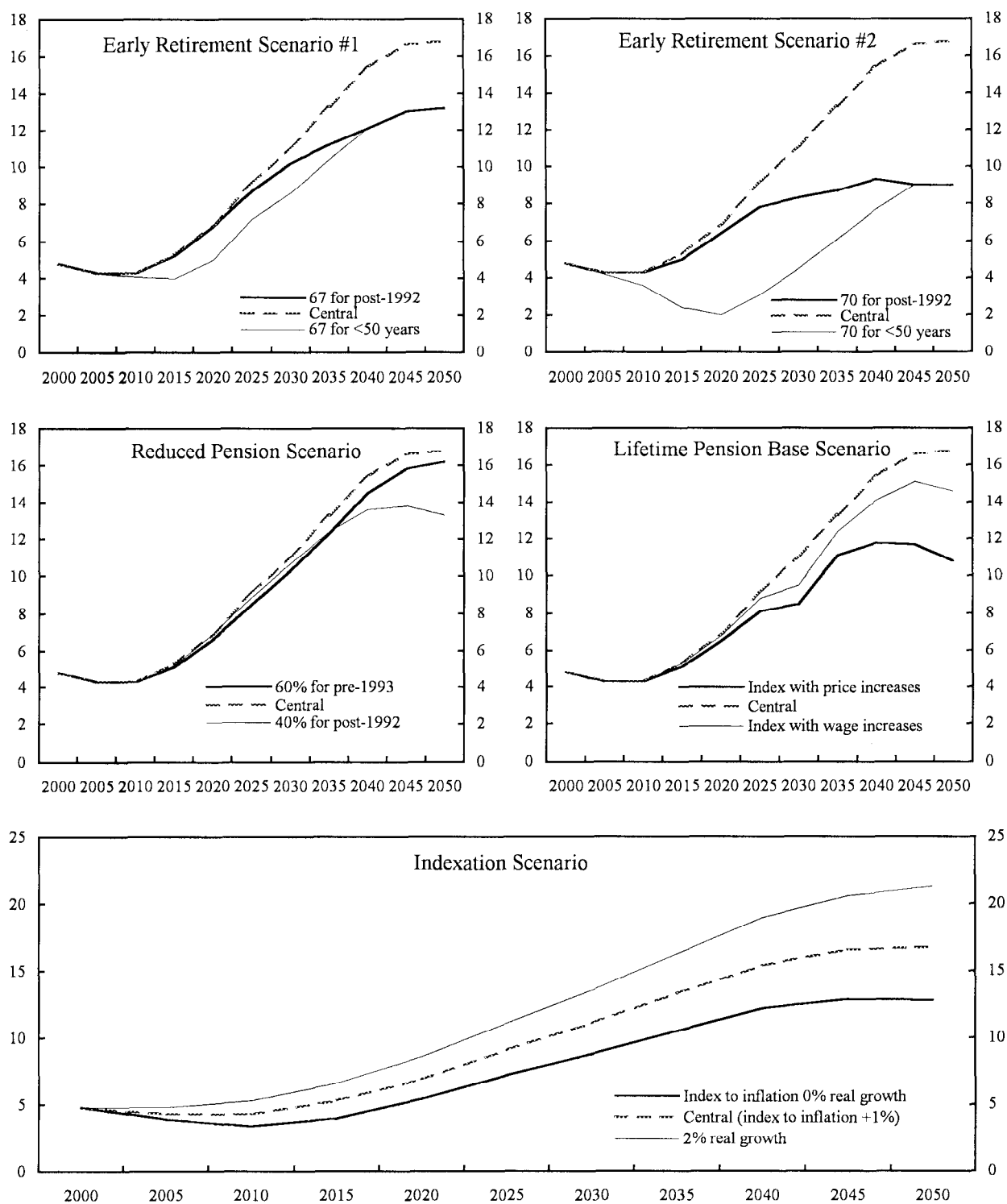
Figure 2. Greece: Pension Expenditure Sensitivity, 2000-50 1/  
(In percent of GDP)



Sources: Government of Greece (2001c); and Fund staff calculations.

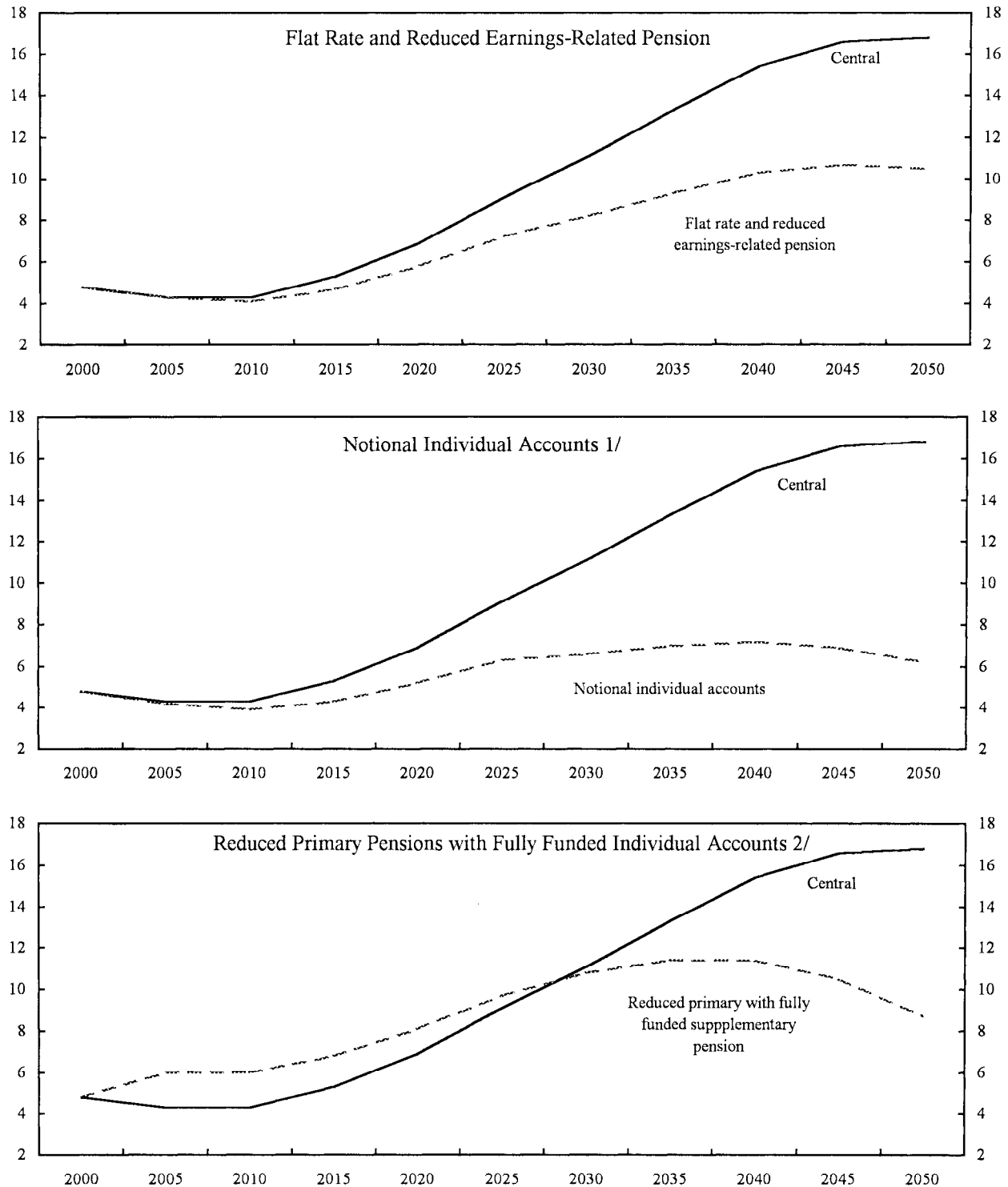
1/ Variants labeled in parentheses are calculated by staff as symmetric deviation from central projection.

Figure 3. Greece: Parametric Changes Scenarios, 2002-50  
(Government pension burden; in percent of GDP)



Source: Government of Greece (2001b).

Figure 4. Greece: Structural Change Scenarios, 2000-50  
(Government pension burden; in percent of GDP)



Source: Government of Greece (2001b).

1/ Notional individual accounts with a contribution rate of 75 percent of the current rate.

2/ Primary pensions accruing in the future at one-half the current rate for post-1992 new entrants, with fully funded individual accounts.