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Pension System Viability and Reform Alternatives in the Czech Republic

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Pension System Viability and Reform Alternatives in the Czech Republic¹

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Abstract

The finances of the Czech pension system have deteriorated markedly in recent years and the aging population will add further strains in the future. The system is also burdened by significant distortions and disincentive effects. This paper assesses the current pay-as-you-go (PAYG) system, including its long-run viability, and discusses reform options. It concludes that alterations to the basic PAYG parameters can go a long way toward addressing the problems, although more systemic changes—such as pre-funding, strengthening the link between contributions and benefits, and diverting part of the pension contributions to a mandatory, private pension savings pillar—could also help.

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I. INTRODUCTION

1. Against the background of the Czech Republic's preparations for EU accession, the authorities have sharpened their focus on the medium- and long-term fiscal risks arising from widespread off-budget activities and large contingent liabilities as well as mounting pressures from mandatory expenditures. However, a strategy remains to be developed that would address the structural weaknesses in the budget and place public finances on a sound medium-term path. This would include reform of the social security system in general and the pension system in particular, where finances have been deteriorating in recent years and population aging represents an additional burden for the future. At the same time, the living standard of pensioners has been eroded in the 1990s and distortions and inequities in the system have emerged and lead to calls from recipients for urgent changes.

2. While the pension system has been undergoing significant transformation in conjunction with the economic transition process, reforms undertaken have been mainly short term aimed at protecting pensioners from the adverse consequences of the liberalization of the economy while expanding opportunities for individuals to take responsibility for insuring their own future. The most significant reforms undertaken in the 1990s include the establishment of a state-contributory supplemental pension insurance scheme in 1994 and the introduction of a new general pension act in 1995 that provided for a phased increase in retirement ages and a closer link between earnings/contributions and benefits. However, these reforms created important new distortions and inequities in the system and did not relieve fully the short-term pressures on the pension finances. More importantly, they did not address the longer-term problems arising from demographic developments and maturing of the pension system.

3. This paper seeks to assess the key problems in the current public pension system, including its long-term financial outlook, and discusses the main alternatives for reform. These alternatives include changes to the main parameters of the current system as well as more systemic changes in the form of funding the pension system, either the public system itself or through a partial shift to mandatory private pension savings. The analysis is supported by extensive simulations of the existing pension system and various reform alternatives based on long-term macroeconomic and demographic projections. It updates and broadens the analysis included in previous studies of the Czech pension system (IMF 1995a and 1995b) and is inspired by studies and recommendations undertaken in recent years by the Czech Ministry of Labor and Social Affairs (*MLSA*).

4. The study is organized as follows: Section II reviews pension system developments in the 1990s both with respect to reforms undertaken and main pension indicators. Section III describes the current structure of the pension system and assesses the existing problems, including the long-term financial outlook of the basic public system. Section IV discusses various parametric and systemic reform options and quantifies their impact on pension system finances. Section V provides the main conclusions of the paper.

II. TRANSFORMATION OF THE PENSION SYSTEM

5. Prior to 1990, the pension system in the Czech Republic was characterized by a lack of transparency and considerable discretion of the government in granting pensions, generous eligibility requirements and benefits, special preferences for certain groups of people addressing concerns not related specifically to the pension system, and discrimination against other groups such as self-employed (*MLSA* 1998a). No separate contributions were collected for social or pension insurance and expenditures were financed from general state budget revenues. The system was static and unable to reflect appropriately economic or demographic developments, the amount of pensions bore little relationship to lifetime earnings, there was limited individual freedom in determining the time of retirement, and there were few possibilities for supplementing the basic public pension insurance on a voluntary basis. As such, the pension system was ill-suited to cope with the economic transformation process and the projected aging of the population.

A. Pension System Reforms in the 1990s

6. In conjunction with the economic reform program, a social reform program was developed in 1990 with the overall objectives of diminishing dependence on the state for social protection while cushioning the social consequences of the transformation, all within the constraints of international conventions and harmonization requirements (*MLSA* 1998b). The key aim for the pension system was to secure old age protection for all citizens while respecting the individual responsibility and the right to alternative arrangements; this was to be accomplished by providing a basic level of insurance through a public pension system and developing of opportunities for voluntary supplemental insurance.

7. The public pension system would rest on the following basic principles: (i) uniformity of treatment (no preferences nor discrimination); (ii) linkage of benefits to insured tenure and contributions through the establishment of a two-tier system with a basic flat rate component to ensure a socially acceptable minimum income level for low wage earners and a percentage based component to ensure a satisfactory link between contributions and benefits (the first component was not to exceed 15 percent of the pension amount and the total old-age pension to wage ratio was to fluctuate around 45 percent); (iii) maintenance of at least the real value of pensions; (iv) recognition of only the period in which insurance premium has been paid as insured tenure (in case of certain accepted "substitution periods" recognized as insured tenure but where premiums could not be paid, the state would pay the premium); (v) definition of eligibility requirements for benefits consistent with demographic developments so as to facilitate the maintenance of sustainable expenditures; and (vi) separation of pension insurance financing from the state budget through the creation of a pension fund.

8. The key reforms undertaken during the period 1990-97 are outlined in Box 1. The reforms initially centered on removing preferences and discrimination inherited from the old system, and subsequently on the establishment of a supplementary, voluntary private pension

Box 1. Pension System Reforms in the Czech Republic in the 1990s

- During 1990-92, preferences in the pension system were canceled and discrimination clauses for self-employed persons were removed.
- In 1993, premiums were introduced as a separate payment outside of the tax system but remained income of the state budget. The period for which the premium was paid and the amount of the assessment base from which the premium was calculated became decisive for the determination of pension benefits.
- In 1994, a state-contributory supplementary pension insurance scheme was introduced. Participation in this system of private pension funds is voluntary and operates on the basis of the individual citizen (rather than employee/employer).
- In 1995, a new material law of pension insurance was approved with effect from January 1, 1996. The overall aim of this law was to restructure the eligibility and benefit system so as to maintain the share of pension expenditure to GDP and counter the pressures on pension system finances from projected demographic developments without unduly burdening future generations, while strengthening intra-generational equity (especially between different types of pensions and between genders) and the link between contributions and benefits.
- From January 1, 1996, a special account of pension insurance was established as part of the state budget. All contributions are credited to this account and can only be used to finance pension expenditures (with any negative balance offset by explicit transfers from the state budget).
- During 1997, two amendments to the 1995 pension act were introduced, one with the main aim of countering some of the provisions that had been modified as part of the compromise on the 1995 reform and had reduced the financial savings expected from the reform.
- During 1990-97, pensions were adjusted a total of 13 times to compensate for higher than expected inflation and correct differences between pensions granted in different periods.

system (supported by the state) as well as measures to strengthen the finances of the public pension system and the principles of equivalence and equity in this system. As far as the public system was concerned, the 1995 reform strengthened the medium- and long-term finances of the pension system through increasing statutory retirement ages, forged a closer link between contributions and benefits through lengthening the period for which earnings are used to establish the percentage based component of the pension and adjusting past earnings in line with wage developments as well as through less progressive taxation of past earnings and elimination of pension minima, harmonized gender treatment (through the granting to men of equivalent rights to survivors benefits), and provided for more uniform early retirement provisions and less arbitrary benefit indexation.¹

9. In terms of the original objectives, the reforms implemented went a long way towards satisfying these, but fell short in some areas and at the same time created certain distortions in the system. Necessary compromises resulted in inter alia expansion of substitution periods, more liberal provisions for early retirement, and more advantageous computation of pensions, which combined with the method of adjustment used since 1996 (whereby the government has taken full advantage of the leeway provided by the law) has resulted in pension system deficits and inconsistencies in the internal structure of pensions that are not perceived as being fair. Further, while separate payroll pension contributions were introduced and a separate pension account was established, the envisaged separation from the budget in the form of a pension fund did not materialize. These problems are elaborated further in section III below. In contrast, several other transition economies and emerging markets undertook more comprehensive reforms of their pension systems aimed at ensuring financial viability and reducing distortions (see section IV).

B. Developments in Pension System Indicators

10. The reforms undertaken during 1990–97 generally helped contain the pressures on pension system finances arising from the transition process. While, contrary to most other transition economies, the large decline in output in the early phase of transition was not associated with a steep rise in unemployment, and restructuring/labor shedding subsequently proceeded at a relative slow pace, the systemic dependency ratio rose rapidly reflecting reliance on early retirement and disability pensions to cushion the impact of market forces (Table 1).^{2 3 4} Meanwhile, the living standard of pensioners relative to wage earners

¹ This was motivated to a large extent by the demographic outlook, with retirement of the 1940s baby-boom generation from early next century, the low birthrates in recent decades, and increasing life expectancy, as well as a secular decline in the female labor participation rate.

² The labor force participation rate remained broadly constant at 73–74 percent reflecting an increase of 4 percentage points for men and a similar decline for women (OECD 1997).

deteriorated markedly as evidenced by a sharp drop in the replacement rate and also fell in absolute terms with the real value of pensions in 1997 below the level in 1989 despite some improvement since 1994.^{5 6} Despite a slightly increasing share of labor in output, the share of pension expenditures to GDP remained stable at about 8 percent through 1996,⁷ before rising to 9 percent of GDP in 1997 due to a sizeable upward adjustment of pensions.⁷

11. On the revenue side, separate social security contributions were introduced in 1993, with the rate for pensions set at 27 percent of gross wage income. Despite a reduction in this rate to 26 percent from 1996, and weakening social security collections, revenues as a share of GDP were maintained at about 8½ percent of GDP reflecting the rapid growth of real wages from 1992. Overall, the pension system balance has weakened gradually since 1994, shifting from a small surplus to a deficit of more than ½ percent of GDP in 1998.

12. While these developments in general mirror those of other transition economies, there are some important differences. Notably, in other countries of transition rising systemic dependency ratios typically reflected also a rising demographic dependency ratio and increasing unemployment, and replacement rates tended to rise significantly.^{8 9} In these

³ Defined as the number of (old age) pensioners in relation to the number of contributors to social insurance.

⁴ Early retirement was permitted for structurally unemployed two years prior to the statutory retirement age at benefits superior to unemployment compensation. There was also a withdrawal from the labor force of persons above retirement age, some of which had earlier deferred benefits at an enhanced rate of accrual (IMF 1995a).

⁵ Defined as the average (old) age pension relative to the average gross wage in the economy.

⁶ The declining replacement ratio reflected only partial and discretionary indexation of pensions; new pensioners were particularly affected owing to the lack of indexation of the earnings base and wage brackets (which translate earnings into benefits at a declining marginal rate) used to assess pensions.

⁷ The share of pension expenditures to GDP is determined by the dependency ratio, the replacement rate, and the share of labor in output (see Appendix 1; a detailed account of pension system economics can be found in OECD 1988).

⁸ Defined as the number of persons above retirement age in relation to the number of persons of working age.

⁹ During 1990–97, the replacement rate increased from 56 percent to 65 percent on average in all Central and Eastern European (CEE) countries, but declined from 53 percent to 45 percent in the Czech Republic. However, (gross) replacement rates are not directly comparable across countries due to differences in tax treatment of both wage income and pensions. In the Czech Republic, social security contributions are not tax deductible and

(continued...)

countries, a stable share of pension expenditures to GDP was maintained primarily through a falling share of labor in output. Also, several countries raised contribution rates to protect the finances of the pension system, but nevertheless the pension balance deteriorated rapidly in many countries, including Poland and Hungary. By the mid-1990s, the key pension system indicators in the Czech Republic were in most respects similar to those of other advanced transition economies, but compared to most industrialized countries, dependency ratios, replacement rates, and the ratio of pension expenditures to GDP were relatively high.¹⁰

III. DESCRIPTION AND ASSESSMENT OF THE CURRENT PAYG SYSTEM

13. As indicated above, the current Czech pension system rests on two pillars: A basic, public pension system based on the social solidarity principle and financed on a pay-as-you-go (PAYG) basis, and a supplementary, state-supported private system based on the insurance principle and financed on a fully funded (FF) basis. This paper focuses on the PAYG system and its key features are described below.

A. Principles and Characteristics

14. The public pension system is guided by the *Pension Insurance Act of 1995* (Act 155/1995 Coll. with effect from 1996) and two *amendments* to this in 1997 (Acts 134/97 and 289/97 Coll.). As indicated above, the Act of 1995 notably stipulated a phased increase in retirement ages and extended the period for which earnings are calculated to determine the percentage based component of pensions, while on the other hand expanding "substitution" (non-contribution) periods, allowing for more liberal early retirement possibilities, and improving the generosity of pension computations. The latest *amendment* sought to reverse the negative impact of these latter compromise provisions on the financial position of the pension system by reducing substitution periods and temporarily changing the indexation mechanism for pensions. The new pension insurance act contained a ten-year protection period to ensure that no pension during this period would amount to less than that implied by the previous act.

15. The key principles of the pension system is compulsory participation, uniform treatment, financing on a PAYG basis, defined benefits with a relatively high degree of income redistribution, mix of flat-rate and earnings related pensions, and state provision of economic and legal guarantees in the form of maintenance of stable replacement ratios and management by a state institution with revenues and expenditures part of the state budget.

benefits are by and large tax exempt, whereas in many other countries (e.g., Hungary) contributions are tax exempt and benefits taxed.

¹⁰ Although several EU countries (e.g. Germany, Austria, France, and Italy) operated more generous and costly pension systems, most of these countries have subsequently undertaken comprehensive reforms aimed at ensuring sustainability and improving efficiency.

16. The PAYG system is financed through contributions from employers and employees, currently at a total rate of 26 percent of gross wages with the largest share paid by the employer (19.5 percent).¹¹ A separate scheme exists for self-employed with a considerable concessional element. Contributions are paid into a separate pension account of the state budget from where only pension expenditures can be undertaken. Exemption from payment of contributions is granted for certain substitution periods such as unemployment, higher level education, military service, and child rearing.

17. Pensions are provided for old-age, disability, and survivors. The statutory retirement age is being raised gradually from 60 years for men and 53–57 years for women (depending on the number of children reared) in 1995 to 62 and 57–61 years, respectively, in year 2007. Early retirement may be taken 2–3 years prior to official retirement if at least 25 years of insurance has been accumulated, with pensions reduced either temporarily or permanently at a specified penalty rate. Full disability pension is provided at the average replacement rate to persons who have lost at least $\frac{2}{3}$ of their working ability, while partial disability pensions are paid in relation to current earnings if at least $\frac{1}{3}$ of the working ability is lost. Survivors pensions are granted to widow(er)s or orphans of deceased old-age or disability pensioners independent of income from other sources. In concurrence of titles to more than one pension, only the highest is paid.

18. The pension formula is a two-tier construction, including a standard flat rate amount for all pensions, and an earnings related part depending on the type of pension. Earnings are assessed for the last 30 years (phased increase from last 10 years during 1996–2015) at current wage levels and “taxed” progressively in determining initial pensions. For old age pensions, the accrual factor is 1.5 per year of insurance. Paid out pensions are indexed to CPI inflation and real wage growth. The basic pension system provides for an average (gross) replacement rate of about 45 percent, significantly higher for low incomes than for high incomes.¹²

19. The differentiation between old-age pensions for different income levels and between different types of pensions declined markedly in the period 1980–97, in recent years mainly related to the introduction of the flat rate component and its increasing share in overall pensions due to cost of living adjustments. The rate of solidarity in the system has increased further at the expense of equivalence as a result of increasingly generous provisions for certain groups of insured such as early retirees, families with children, unemployed, students, and self-employed. In addition to the weakening relationship between contributions and

¹¹ Total social security contributions (including to health and unemployment) amount to 34 percent of gross wages, of which 8 percent are paid by the employee.

¹² The “net” replacement rate (pensions net of tax in relation to take home wages i.e., after employee social security contributions and taxes) is significantly higher, e.g. 63 percent for a person with an average income tax rate of 20 percent.

benefits, distortion or injustice has been introduced inadvertently in the form of substantial differences between pensions granted before and after the new pension law took effect in 1996. Meanwhile, the pension system finances have come under increasing pressures as evidenced by mounting deficits in recent years. The longer term outlook is assessed below.

20. As discussed in more detail in section IV below, the basic Czech pension system remains relatively generous in certain key aspects, notably with regard to eligibility, compared with other advanced transition economies that have undertaken comprehensive pension reforms and industrialized countries. Thus, statutory retirement ages remain relatively low and particularly favorable for women, penalties for early retirement remain limited, non-contribution periods are widely accepted, the minimum contribution period required to obtain full pension is still quite short, and the time period for assessing earnings in computation of the pension base is only slowly being lengthened. Also, contribution rates are quite high.

B. Long-Term Financial Outlook

21. The long-term financial outlook of the pension system is as in most other transition economies as well as industrialized countries affected by the aging of the population and gradual maturing of the pension system itself. By nature, long-term projections are very sensitive to the specific demographic and macroeconomic assumptions employed, but nevertheless useful to illustrate the potential consequences of inaction. The *MLSA* (1998a) projected that the cumulative deficit of the Czech pension system would reach 3 years of pension expenditure by the year 2020 based on the existing legal framework, contribution and replacement rates, and internal macroeconomic and demographic assumptions.¹³ Maintaining balance as you go would require a gradual increase in contribution rates to 36 percent by year 2020; alternatively, intertemporal balance could be ensured through pre-funding in the form of an up-front increase in the contribution rate to 29 percent or a capital injection of CSK 600 billion (about 30 percent of GDP).

22. In addition to the sensitivity of this projection to the factors mentioned above, it does not capture potentially important demographic changes over the very long term during which the entire current workforce retires. It is therefore useful to re-examine the long-run viability of the pension system using updated macroeconomic assumptions extending the time horizon to year 2050 (on the basis of population projections from the World Bank 1994) as done in most other studies (Scenario I).

23. The key *macroeconomic assumptions* are outlined in Table 2. The potential GDP growth rate during the transition period may be in the order of 4–5 percent allowing the

¹³ Specifically, the macroeconomic assumptions were a gradual decline in inflation to 2 percent and in nominal wage growth to 4 percent, stabilization of the unemployment rate at 6½ percent, and a gradual easing of interest rates to 7 percent.

Czech Republic to catch up with EU/OECD income levels in 15–20 years.¹⁴ Subsequently, growth would be expected to slow to 2–3 percent in line with normal industrial country rates. With population growth close to zero, the labor force participation rate assumed to remain broadly constant, and the unemployment rate assumed to stabilize at about 10 percent, the implied growth in labor productivity is somewhat higher than that observed in recent years for the economy as a whole, but consistent with developments in industry. Real wages should rise broadly in tandem with productivity as a tendency for the share of labor in output to rise towards EU levels may be offset by stabilization concerns: Inflation should decline gradually and reach the EU level of about 2 percent around the time of accession in 2003–2005.¹⁵ The real rate of interest is assumed to correspond to the real rate of GDP growth according to the golden rule (implying zero rate of time preference), which, realistically, would leave it slightly higher than is typical for more advanced economies during the convergence period, and then decline towards the neutral, real short term interest rate observed for e.g., Germany in the past.

24. The *demographic projections*, which reflect assumptions about future variations in fertility, life expectancy, and immigration flows, in conjunction with an assumption that the shares of old age pensioners to persons above retirement age (some persons over retirement age receive other types of pensions which may be higher than the old age pension to which these persons would then not be entitled) and of contributors to employed remain constant, imply that the old-age (systemic) dependency ratio increases from less than 40 percent now to 65 percent in year 2050 (Figure 1). The systemic dependency ratio declines slightly until year 2007 due to the approved increase in retirement ages, after which it rises continuously reflecting both the retirement of post-World War II baby-boomers (and later the retirement associated with a second increase in birthrates in the 1970s) as well as continued increases in life expectancy.

¹⁴ See e.g., Fischer et. al. 1998a and 1998b that link long term potential growth rates for transition economies to the initial level of per capita income, investment in human capital (proxied by primary and secondary school enrollment), capital investment, government consumption, and population growth in accordance with neo-classical and endogenous growth models. While the Czech Republic ranks in the top among transition economies both in terms of the initial level of per capital income and macroeconomic and policy convergence, and further compares favorably in terms of education standards, capital formation and exports with countries that have grown rapidly in the past, the recent lackluster growth performance suggests that such high rates of potential output growth will require a substantial deepening of structural reforms, including bank privatization and enterprise restructuring, and a recovery of the investment/GDP ratio.

¹⁵ Inflation could be somewhat higher (3–4 percent) with continued faster productivity growth in the traded goods sector relative to non-traded goods (Belassa-Samuelson effect). Also, initial participation in the ERMII rather than EMU would allow for some continued exchange rate flexibility to offset potential losses in competitiveness.

25. In projecting pension system revenues and expenditures, a number of *additional simplifying assumptions* are made. Most fundamentally, it is assumed that the prevailing average old-age replacement rate of about 45 percent is maintained throughout the projection period. While the recent amendments to pension legislation, including indexation of pensions mainly to consumer price inflation and the gradual extension of the earnings assessment base, imply a secular decline in the replacement rate, this assumption not only simplifies the calculations, but may also be seen to reflect social and political resistance to a further worsening of the relative living standard of pensioners and in some sense be the more relevant *ceteris paribus* assumption. Certainly, the Czech replacement rate does not appear to be particularly high by international standards. Other assumptions include a constant share of the population receiving non-old age pensions and average size of these pensions (implying a moderate increase in the non-old age dependency ratio), and constant shares of administrative expenditures to total pension expenditures and contribution collection rate of about 2 percent and 95 percent, respectively.

26. On the basis of these assumptions, the pension system deficit remains manageable at less than 1 percent of GDP through year 2006, but rises quickly thereafter to reach 5 percent of GDP in year 2025 and 11 percent of GDP in year 2050 (Figure 2). Pension system debt rises to unsustainable levels, reaching 40 percent of GDP in year 2025 and 135 percent of GDP in year 2050.¹⁶ To maintain year-by-year balance in the pension system, the contribution rate would need to rise gradually to 36 percent in year 2025 and 42 percent in year 2050, or, for the sake of illustration, the replacement rate would need to decline to 27 percent in year 2025 and 22 percent in year 2050 (Figures 3 and 4). These projections are insensitive to the assumption about real GDP growth given the assumptions of a constant replacement rate and share of labor in output, but in general public pension schemes that link contributions to wages and benefits to CPI inflation are more viable when GDP growth rates and real interest rates are higher. On the other hand, *sensitivity analysis* shows the expected vulnerability to changes in the rate of unemployment or labor force participation, with more adverse labor market developments adding further significant pressures on the pension system.

27. While the issue of long-run viability ultimately is related to the current or future political will to implement the changes required to address the growing imbalances of the pension system, it is clear that the dramatic increase in contribution rates or decline in replacement rates implied in the above analysis are neither politically feasible nor economically sound. Nor is adjustment to the general budget of the magnitudes implied. This underscores the need for further reform, including as a condition for EU membership down the road.

¹⁶ Such a disturbing outlook for the pension system is by no means unique to the Czech Republic (see e.g., Chand and Jaeger 1996 for an analysis of the financial prospects for pension systems in G7 countries and Koch et. al. 1997 for the Austrian system).

IV. OBJECTIVES AND ALTERNATIVES FOR FURTHER REFORM

28. The fundamental objective of reforming the pension system is to restore its long-term viability, but several other considerations are important in deciding on the strategy and measures to achieve this objective. These include intergenerational equity, the desire to reduce distortions in the economy (notably the labor market) caused by the pension system as well as distortions within the system itself, securing an appropriate balance between the principles of equivalence and solidarity (the former relates to the link between contributions and benefits while the latter relates to the degree of redistribution), development of the capital market, and external constraints in the form of ratified conventions and integration into the EU. As any pension reform would affect virtually all citizens sooner or later and stability of the system is needed to sustain confidence, it is essential that it relies on broad social consensus.

29. This section will focus on the financial implications of different reform alternatives, although clearly the broader concerns to improve the functioning of the economy and secure the desired distribution of income weigh heavily in designing the appropriate reforms. The reform recommendations of the *MLSA* (Box 2) include a number of immediate measures to reduce existing distortions in the pension system, as well as steps to strengthen the short-term finances and long-run viability of the system that will be referred to in the discussion below.

30. There are basically four ways to address the financial imbalances of public pension systems (see e.g., Chand and Jaeger, 1996): (i) through *parametric reform* of the PAYG system by revising retirement ages, contribution rates, or replacement rates (benefit determination, indexation, etc.); (ii) through *systemic reform*, principally by partial or full funding of the public pension system or substitution with a (mandatory) private, fully funded (FF), defined contribution (DC) system; (iii) through general fiscal adjustment; and (iv) through modifying the macroeconomic profile, including measures to affect e.g., labor force participation and migration. Borrowing features from the funded system, the PAYG system may also be modified by linking benefits directly to contributions through individual *notionally defined contribution accounts*.

31. The focus here is on the first two options, although it may in principle be less distortionary to address the pension system imbalances through general fiscal adjustment in the form of expenditure cuts or increases in e.g. consumption taxes, and there may be increasing scope for augmenting the labor force through international factor mobility. As a means of addressing the more or less global aging problem and associated pressures on public finances, The World Bank has in recent years favored the adoption of multi-pillar old age pension systems, including a public PAYG system focussed on providing a social safety net for the elderly, a mandatory private insurance pillar providing FF pensions based on individual contributions, and a voluntary private pension savings pillar.

32. Several other transition economies have in recent years implemented more comprehensive reforms of their pension systems along the lines of the World Bank

Box 2. Recommendations of the Ministry of Labor and Social Affairs

The *MLSA* has recommended to proceed in three steps in reforming further the PAYG pension system (see *MLSA* 1998b). Any reforms should safeguard the existing average replacement ratio of about 45 percent, while ensuring that low income workers receive a pension above the subsistence minimum from the basic public system after a certain minimum tenure. Higher income workers would rely on supplementary insurance from the private sector.

Step 1 (adjustments to the current structure):

- Initiate the process of reducing the difference between pensions granted before December 31, 1995 and after January 31, 1996 (old pensions need to be adjusted relatively fast in the future).
- Gradually increase the differentiation of pensions by size which was disrupted severely as a result of the adjustment methods used in 1996-97 (e.g. by restricting the increases in the basic sum during future adjustments while giving greater weight to the percentage based sum or through changes in the earnings brackets used for computing pensions).
- Adjust the distorted proportions between individual types of pensions (especially the relative advantages of non-old age benefits) by limiting the adjustment to the basic sum and thus reducing its share of such benefits.
- Establish long-run stability of the intended replacement rates for different types of pensions by modifying and embedding in law arrangements for adjustment (to paid pensions and fixed sums in the pension formula).
- Limit the advantage of early retirement by making actuarially fair reductions in pension benefits.
- Continue the process of limiting the recognition of substitutable periods or demanding that the institution recognizing such periods pay the premiums during the period.
- Gradually limit the concessions granted to self-employed in establishing the assessment base on which premiums are paid.
- Increase the contribution rate to preserve balance in the pension system in the next few years.

Step 2 (further reform of the unfunded system; strengthening of equivalence principle):

- Modify eligibility through increasing the statutory retirement age to 65 for both men and women at roughly the current pace. Further, extend the insured tenure needed to qualify for full old-age pension to 30-35 years instead of 25 years at present.
- Alternatively, introduce a system of Notionally Defined Contribution Accounts.
- Create separate pension fund and raise contribution rate to partially pre-fund system.

Step 3 (consider partial transition to a fully funded private system):

- Need to solve problems related to social solidarity, transition costs, and capital markets.
- But diversification of demographic and economic risks in mixed system desirable.

recommendations, including substantial reforms of their existing PAYG systems.¹⁷ Similar to, but going further than the Czech Republic, parametric PAYG reforms have typically included increases in retirement ages, increasing the number of years used to calculate the pension base, and modifying indexation rules, but in addition eligibility criteria and benefits have been tightened through inter alia lengthening of minimum contribution periods and reduction in non-contribution periods, and in some cases the contribution base has been widened and tax administration firmed. In addition to the general tightening of the basic parameters of the PAYG systems, two countries (Latvia and Poland) have modified these systems on the basis of notionally defined contribution accounts. Where private FF components have been introduced, this has generally been done alongside the basic PAYG system as part of a multi-pillar system (Hungary, Poland, Latvia, and planned by e.g., Bulgaria, Romania, Slovenia, and Russia), with only Kazakhstan opting to switch fully to a FF system.^{18 19}

A. Parametric Reforms

33. The most commonly used and least complex way of addressing pension system problems is through adjustments to the main parameters of the public PAYG systems. This may take place either on the revenue side through changes in mandatory contribution rates or on the expenditure side by tightening eligibility conditions or reducing benefits either through changing the mechanism for calculating initial pensions or through the indexation mechanism for these. More specifically, such expenditure measures include raising statutory retirement ages or tightening early retirement provisions (including through improving the actuarial fairness of the pension formula), making substitution periods less generous, lengthening the minimum contribution periods required for full pension, extending the period for which past wages are considered or reducing the accrual rate in determining the base for pension calculations (assuming that incomes rise over the life cycle), or indexing past wages or paid out pensions to consumer price inflation rather than wage developments to compensate only for changes in the cost of living. Further, eligibility conditions for non-old age pensions may be tightened.

¹⁷ See e.g., Cangiano et. al. 1998 for a comprehensive review; Box 3 includes relevant case studies.

¹⁸ See e.g., de Castello Branco (1998) for an overview of pension reforms in the BRO countries.

¹⁹ In Western Europe, reforms proposals have generally centered on modifications to the PAYG system while there has been resistance to more systemic reforms such as partial prefunding of the PAYG system or mandatory private pensions savings (see e.g. IMF 1997c for a discussion of reform proposals in Germany).

Box 3. Pension System Reform in Selected Transition Economies

Hungary: Hungary approved a comprehensive reform of its pension system in 1997, including a strengthening of the PAYG system and the introduction of a second, mandatory private savings pillar (see Ruggiero 1996 and 1997 for a detailed analysis of the reform). The PAYG reforms comprised a phased increase in the statutory retirement age to 62 years for both men and women, while permitting early retirement with full pension up to three years earlier provided that a minimum contribution period of 40 years has been achieved. Retirement prior to that attracts penalties at an increasing rate, somewhat stricter than in the old system. Further, the benefit formula was modified through phasing out of the regressivity factor and compensating changes in accrual rates, and contributions were exempted from tax while benefits were subjected to tax. Finally, the indexation formula was altered to an equal mix of wages and prices. These reforms restored solvency to the existing pension system by securing small surpluses until the middle of the 2030s. Switching to the new multi-pillar system would be mandatory only for new entrants and probably only attractive for younger people. About 1/4 of total contributions to the new multi-pillar system would be directed to the second pillar, resulting in a revenue loss to the public pension system of about 1 percent of GDP per year in the early years of reform. However, the reformed PAYG system would ensure that overall public pension deficits would be limited and financeable through fiscal adjustment. The full reform package would close the gap with a no reform scenario already in year 2004.

Poland: The Polish government has also approved a comprehensive pension reform program including establishment of a multi-pillar system, and significant changes to the PAYG system have been legislated. These include raising statutory retirement ages to 65 years for men and 60 years for women, and the introduction of notionally defined contribution accounts. Two options are being considered for the second, mandatory private savings pillar: Mandatory switching to the new multi-pillar system for all persons under the age of 30 years, or voluntary switching for current workers under the age of 50 years. 20 percent of the total 45 percent payroll tax on net wages would be directed to the second pillar, implying a potential loss of revenues for the public pension system of up to 2 percent of GDP annually. It has been suggested that this could be financed through the use of privatization revenues.

Latvia: The Latvian pension reform approved in November 1995 followed the Swiss model. It entailed a gradual switch to a multi-pillar system, with the first stage (1996) a reform of the PAYG system based on NDCA with no mandatory retirement age but actuarially fair retirement provisions expected to extend the effective retirement age. The second stage was development of a legal framework for regulation of private pension funds (1997), and the final stage is the introduction of a mandatory private savings pillar (1999-2001), financed through savings on the reformed PAYG pillar.

Kazakhstan: The Kazakh pension reform approved in June 1997 resembled the Chilean and Austrian models with a complete switch to mandatory private savings. Switching would be required for the whole current labor force and new entrants: Existing pensioners would be partially financed by earmarking a portion of the prevailing contributions (15.5 percent; gradually declining to 0), with the remainder (10 percent) directed to the new private system. The fiscal impact of the transition was estimated to be 2 percent of GDP in the first year and the aggregate cost of transition about 40 percent of GDP (in NPV terms). This would be financed through privatization, increased tax revenues from the expected economic recovery, and debt issuance.

34. The required *increases in contribution rates* have already been discussed in the passive long-term projections above. These are already at a high level in the Czech Republic, and further substantial increases would be problematic not only from a political point of view, but would also add to the labor market distortions created by the tax nature of public pension contributions. Nevertheless, contribution rates may need to be increased somewhat at least temporarily until expenditure measures take hold in order to avoid a further deterioration in the pension system finances as also recommended by the *MLSA* and proposed by the current government.

35. Given the resistance of current pensioners to a lowering of their benefits, emphasis is on measures to reduce future benefits, and current workers are thus faced with the choice of paying more now or receiving less in the future. Most of the measures listed work directly or indirectly to reduce initial replacement rates for new retirees, but the impact is difficult to quantify in the absence of detailed information of the current structure of the pension system and assumptions about future income developments etc. of different cohorts. As such, these measures will be discussed qualitatively, while most attention will be devoted to quantifying the impact of extending further retirement ages.

36. As discussed in section III and noted by the *MLSA* in their reform recommendations, there would appear to be considerable scope for tightening *early retirement provisions* by making actuarially fair reductions in pension benefits, limiting the recognition of *substitution periods* or at least requiring that the state pay premiums for the insured during such periods to make transparent the costs, reducing the generosity of non-old age pensions (especially survivors pensions), and limiting the *concessions* granted to self-employed.²⁰ Further, it would appear reasonable to extend the *insured tenure* required to qualify for full old age pension from the present 25 years to at least 30–35 years as recommended by the *MLSA*, but possibly even to 40 years as done in many other countries, including Hungary, Austria, and Germany (Table 3). Also, a more rapid increase than currently in train in the length of the period of assessed earnings for calculating benefits could be considered, or a modification to include entire career earnings as done in certain countries (e.g., Germany and the U.K.) might be an option. Finally, the mechanism for indexing pensions could be modified to remove the link to real wage growth so that pensions would be adjusted only for price developments as practiced in several countries, including Poland and many industrialized countries. This is a more efficient way of indexing pensions and would include current pensioners more in the burden of adjustment.

²⁰The current provisions favor early retirement. If retirement is taken two years prior to the statutory retirement age, total lifetime pension is approximately 10 percent higher than would otherwise be received, while if retirement is taken three years prior, the benefit is 5–8 percent (*MLSA* 1998b). In the latter case, pensions should have been reduced permanently by around 1 percent rather than the prevailing 0.3–0.6 percent for each three months of early retirement.

Extending retirement ages: Simulation of financial impact

37. Extending further mandatory retirement ages for both men and women to reflect continued increases in life expectancy as living standards improve, harmonizing these gradually with those of industrialized countries in general and the EU in particular, would appear to be the most appropriate option in terms of continuing present pension policies and addressing the long-term aging problem. Statutory retirement ages are being increased to 62 for both men and women in Hungary, and in Poland the retirement age is being raised to 65 for men and 60 for women. The latter is also typical for EU countries, although some (e.g., Germany and Sweden) are unifying the age for men and women at the higher level.

38. The *MLSA* has analyzed an alternative scenario in which the retirement age continues to increase at the same rate as currently in place through year 2007 until the year 2020 when it would reach 64 years and 2 months for men and an average of 63 years and 4 months for women. Maintaining the assumptions that the current contribution rate of 26 percent and replacement rate of 44 percent remain unchanged throughout the projection period, the pension system deficit gradually increases to reach a cumulative deficit of about 2½ years of pension expenditure in year 2020. Maintaining pension system balance as you go would require a gradual increase in the contribution rate to about 32 percent in year 2020.

39. Modifying this scenario (*Scenario II*) to allow for a further increase in the retirement age to reach 65 years for both men and women in year 2025, and maintaining the alternative macroeconomic and demographic assumptions discussed above, yields the following results: The old-age (systemic) dependency ratio remains broadly unchanged through year 2035, after which it starts rising due to the factors mentioned and reaches 45 percent in year 2050 (Figure 1). The pension system deficit remains manageable throughout most of the projection period, although it would start rising excessively towards the end and result in pension system debt of over 30 percent of GDP by year 2050 (Figures 2 and 5). Pension system balance as you go in this scenario could be secured for some years beyond the first quarter of the next century with only marginal increases in the contribution rate or declines in the replacement rate, although the contribution rate would need to rise to 33 percent (or the replacement rate would decline to 32 percent) by year 2050 (Figures 3 and 4).

B. Notionally Defined Contribution Accounts

40. A more systemic conceptual reform of the PAYG system aimed at strengthening the link between contributions and benefits involves the establishment of "Notionally Defined Contribution Accounts" (NDCA), in which individual contributions are recorded but no real funds accumulated. The insurance company would credit funds to the individual accounts for substitution periods, while premiums from other periods of non-contribution (typically unemployment) would be collected from the associated benefits. The notional rate of return in these accounts would be linked to movements in the contribution base, typically the wage bill, while pension benefits would be indexed to the consumer price index. At retirement, accumulated funds would be converted to an annuity based on the remaining life expectancy.

Existing pensioners would be supported by payroll contributions, and a minimum pension amount would be ensured for the poor.

41. There are several advantages to such an approach, including a higher degree of transparency by making explicit the actuarial mathematics of the PAYG system, a potential strengthening of the pension system finances by linking benefits to changes in the revenue base and discouraging early retirement, endogenous adjustment to changes in life expectancy, and a benefit structure that allows for easy integration with a FF pillar. The need for a mandatory pension age would essentially be suppressed. The stronger link between contributions and benefits could also improve the incentive for formal labor market participation. On the other hand, such a system does not solve the aging problem or protect against adverse economic shocks, and it would still be necessary to implement a sustainable contribution rate.

42. A few countries have so far implemented such a system of NDCAs as part of a general reform of their pension systems, including Italy (1995), Latvia (1996), Poland (1998), and Sweden (1998). It is also recommended by the *MLSA* as an alternative to raising further retirement ages or the length of insured tenure required for full pension in the effort to establish a closer link between contributions and benefits and strengthen the finances of the Czech PAYG system. However, considerable resources would need to be devoted to establish a central registry of personal files.

C. Pre-Funding of PAYG System

43. The PAYG system may be funded either fully or partially through capital injections to a pension fund or through the imposition of higher than currently needed contribution rates. Full funding would require a *sustainable contribution rate* with which there would be no net accumulation of pension fund assets or liabilities over a specified, long-run time horizon (this corresponds to an intertemporal budget constraint under which the net present value of pension revenue and expenditure is zero). The accumulation of financial reserves would reduce or eliminate the need for future increases in contribution rates or payroll taxes and could thus help spread the burden of adjustment more equitably between generations. There could also be efficiency gains from tax smoothing. Most likely funding would stimulate national savings, although Ricardian equivalence suggests that there would be some offsetting impact on private savings and a pension fund surplus may increase pressures for a relaxation of fiscal policy.²¹ Further, financial discipline could be enhanced by making explicit the costs of promises to future pensioners. Finally, the accumulation of pension fund

²¹ As pre-funding represents intergenerational transfers, the Ricardian effect may be limited in the absence of a perfect intergenerational link by an operational bequest motive (see e.g., Sadka et. al. 1998). However, higher national savings could depress the rate of return on pension fund assets, depending on the openness of the capital market.

reserves could help spur development of the capital market by increasing demand for various capital market instruments, although difficult financial management issues could arise.

44. Some industrialized countries (e.g., the U.S., Canada, and Japan) have partially pre-funded their PAYG systems (see e.g., Van den Nord et. al. 1994). While raising the contribution rate significantly in the Czech Republic as discussed above would be undesirable for a number of reasons, a limited up-front increase in the rate that would eliminate the need for continuous further upward adjustments could probably be tolerated. Establishing a separate public pension fund and implementing a sustainable contribution rate would serve an important role in enhancing further fiscal transparency and in providing a pool of funds that could help lift the capital market in conjunction with recent measures to improve its regulation. On the other hand, there could potentially be problems associated with the management of a large, public pension fund (notably how assets are invested) and in securing that pension funds are not used for other purposes.

Simulation of financial impact

45. Assuming for simplicity that a long-run steady-state situation is reached by year 2050, full funding of the Czech pension system would (according to model simulations) require that the contribution rate be raised to 35 percent (starting in year 2000) in Scenario I, implying a "contribution gap" (the difference between current and sustainable contribution rates) of 9 percent (Figure 3). Given the demographic outlook, the pension fund would be running surpluses of 2-3 percent of GDP during the first two decades of reform with accumulated assets peaking at over 30 percent of GDP around year 2020 before being run down over the following 30 years (Figures 6 and 7). If the increase in retirement ages were extended to year 2025 (Scenario II), the sustainable contribution rate would be 29 percent, and the contribution gap thus relatively small (Chart 3). The pension fund would be in a small surplus (less than 1 percent of GDP) throughout most of the period with assets peaking at less than 10 percent of GDP around year 2035 (Charts 6 and 7).

D. Privatization of the Pension System

46. A more fundamental reform entails the partial or full privatization of the pension system through the establishment of a second mandatory private FF pension pillar, either next to the public pension pillar as part of a multi-pillar system or in place of this. As mentioned above, most countries that have implemented systemic reforms of their pension system have opted for a multi-pillar system, although the weights of the different pillars have varied considerably from continued main reliance on the 1st pillar (e.g. Hungary and Poland), over the Swiss model of 50/50, to almost full reliance on the 2nd pillar (e.g. Austria, Chile, and Kazakhstan).²² The basic considerations are the same whichever form is adopted, but

²² Private schemes are usually fully funded, defined contribution schemes, but this need not be the case (see e.g., Geanakoplos et. al. 1998 for a discussion of the various alternatives).

(continued...)

obviously all financial and other aspects of the transition are magnified in the case of full privatization.

47. The main potential advantages of privatizing partially or fully the pension system include reduction of labor market distortions, capital market development, higher rates of return on pension savings, higher national savings, investment and growth, and protection from political risk (see Box 4 for a summary of key considerations in pension system privatization). On the other hand, problems include the fiscal costs of the transition, higher costs of administration in the private system, inadequate capital market supervision/regulation and rate of return risk, and securing the desired income redistribution within and between generations.²³ The latter problems raise serious questions about the possibility of achieving welfare gains, certainly in a Pareto sense.²⁴ With PAYG and FF systems aimed at satisfying different objectives (redistribution, insurance, mandatory saving) and subject to different types of political and economic risk, multi-pillar systems may have the advantage of diversifying the pension system risks and exploiting the relative benefits of the different systems.

48. As is the case for other countries, it is very difficult to assess the relative importance of the various pros and cons listed above and to assess the optimal mix of PAYG and FF systems for the Czech Republic. In addition to the crucial but intangible risk diversification argument, perhaps the main benefit to be derived from the introduction of a FF pillar is that it could make required reforms of the PAYG system more palatable, at least with the younger generations, who are likely to favor the diversion of at least part of their pension savings to contribution linked benefits at a potentially higher rate of return. While the evidence from other countries on the effect on national savings is mixed, and the observations of improved

Such schemes have been particularly popular in Latin America, including Argentina, Peru, and Colombia (see e.g., Clavijo 1998 for the latter).

²³ In principle, a higher rate of return in a private scheme is offset by a higher tax liabilities (the need to pay interest on the realized, accumulated pension liabilities), unless the private investment funds diversify into higher yielding stocks to which private access has for some reason been restricted.

²⁴ For an in depth discussion of the pros and cons and other aspects of pension system privatization see e.g. Chand and Jaeger (1996), Hemming (1998), and Heller (1998). Chand and Jaeger show—using a stylized, dynamic life-cycle model—that net welfare gains from the transition to a privatized pension system depend on the contribution structure and link between benefits and contributions in the PAYG system as well as how transition costs are financed. Hemming notes that the main argument in favor of mandatory over voluntary private savings rests on adverse selection and myopia, and Heller notes that the problems with FF, DC schemes suggest that it is better to reform PAYG systems, including through pre-funding and strengthening the link between contributions and benefits.

Box 4. Key Considerations in Pension System Privatization

Reduction of labor market distortions: The closer link between contributions and benefits in a private system may reduce the labor market distortions arising from the perceived tax character of contributions to the public, defined benefit system. Compliance may improve for the same reason.

Capital market development: The accumulation of pension savings in private funds will increase the demand for investment securities (including stocks) and thus help stimulate development of the capital market and improve the efficiency of resource allocation. Countries with large pension funds tend to have high stock market capitalization and low transaction costs (see e.g. Levy 1995).

Higher rate of return: In the long run, the rate of return in private pension funds (related to the interest rate) is likely to be higher than the implicit rate of return in a PAYG system (determined by the growth of the contribution base and thus wage and population growth) as population growth slows. This would allow a given benefit level to be achieved with lower contributions (which would also reduce labor market distortions). However, a FF scheme could have high administration costs.

National savings: Ceteris paribus, the reduction of public savings arising from the loss of contributions would be exactly offset by higher savings in the private pension funds if overall contribution and replacement rates are maintained and no fiscal consolidation takes place to finance the deficit. However, the factors discussed above may stimulate national savings both directly and through higher investment and growth (a higher rate of return in a private system could also lower private savings through wealth effects). Further, if the cost of government borrowing to finance the resulting cash deficit exceeds the implicit rate of accumulation of additional pension debt in the PAYG system (related to wage growth), a "true" deficit emerges that would warrant fiscal adjustment to sustain the pension debt as a share of GDP (see e.g. IMF 1997d). The conversion of implicit to explicit debt may also be associated with a recognition effect by financial markets demanding higher interest rates, especially if the risk of repudiation is seen as less than under PAYG.

Fiscal cost of transition: Privatizing the pension system would inevitably have a significant cash fiscal cost, the size depending on the degree of privatization and speed of transition. This may be financed through issuance of debt, use of privatization proceeds, fiscal adjustment, or other ways with different macroeconomic implications. Complications may arise in relation to EU accession, where the surplus/assets of the private pillar is not included in the fiscal criteria. Fiscal costs would be compounded by any guarantees on minimum pensions in the private system.

Rate of return risk: A private pension system is subject to the risk of systemic or market turmoil induced declines in asset prices and may not be able to protect adequately against inflation or longevity risk (especially in the absence of well developed financial markets, including indexed instruments and annuities). These problems may be exacerbated by a weak financial and supervisory structure. Strengthening supervision and regulation and mandatory insurance (rather than government guarantees) would dampen these concerns. On the other hand, a private system is less subject to political risk regarding the future level of contributions and pensions.

Income redistribution: Privatizing the pension system raises complex issues of equity both between and within generations. While a PAYG system is inequitable between generations if the population is aging, intergenerational equity problems could be aggravated if most of the transition costs are borne by the current working generation. Similarly, while a PAYG system is inequitable within generations owing to differences in life expectancy and labor productivity/lifetime earnings in the presence of progressive tax-benefit links, a fully privatized, defined contribution pension system does not provide for any income redistribution and thus satisfies only the insurance objective of the pension system. Intra-generational equity concerns necessitate the need for securing at least a minimum acceptable pension income for low-income workers through a public system.

growth performance in several countries following comprehensive pension reform is also related to better macroeconomic management and broader structural reforms, there is widespread agreement that private pension funds can make an important contribution to the development of the capital market.²⁵ The need for this is undeniable in the Czech Republic.

49. However, important concerns relate to the still inadequate regulation and supervision of capital market institutions, and the memories of the past behavior of several private funds (notably the Investment Privatization Funds) still linger (see e.g., World Bank 1998). The development of an appropriate institutional framework, including prudential investment guidelines, proper accounting rules and transparency, assurances that returns on pension savings accrue to contributors, and the establishment of a supervisory body (which could also oversee voluntary savings), would be an essential pre-condition. It is also conceivable that a government guarantee of a minimum pension level would be required. These measures all accompanied the introduction of FF pillars in e.g., Hungary and Poland.

50. Perhaps the main problem relates to the fiscal costs of the transition to a FF or multi-pillar system. Such a shift is associated with not only substantial cash fiscal costs as contributors shift partially or fully to the new system while the state must continue to honor its pension obligations, but potentially also an increasing public debt burden as the conversion of implicit to explicit debt is associated with a higher rate of return to the extent that the interest rate on explicit government debt exceeds the implicit rate of return in the PAYG system (the growth in the contribution base/wage bill). These costs can be mitigated through retaining a substantial PAYG pillar and a more gradual transition to the new system, but remain high under any scenario.

51. While larger cash fiscal deficits would be offset by higher private savings and thus not have any real macroeconomic implications that would warrant adjustment per se, and the relatively low level of explicit public debt in the Czech Republic provides considerable room for this to rise while remaining in compliance with EU entry conditions, an unsustainable rise in the public debt ratio would clearly need to be avoided.²⁶ This could be achieved through further reforms to the PAYG system, general fiscal adjustment, or use of privatization revenues to retire public debt and thus reduce the future interest burden. Fiscal adjustment would stimulate national savings, and earmarking of divestment proceeds for debt reduction would reduce the risk that such resources were spent for other purposes. An alternative arrangement would be to retain the existing public system for the whole (present and future).

²⁵ See e.g., MacKenzie et. al. (1997) for a comprehensive discussion of pension regimes and savings.

²⁶ Also, there is a large stock of contingent liabilities related to guarantees etc. whose expected present value amounts to about 15 percent of GDP, and public debt will rise further over the medium-term as sizeable fiscal deficits are expected to continue not only because of the pension system (see IMF 1999).

working population while making the mandatory private system additional (see e.g., Feldstein 1997).²⁷

52. Other countries have addressed the fiscal problem in different ways: Hungary initially relied on debt financing as the initial budgetary impact was limited, but retained an unchanged medium-term fiscal stance implying some underlying adjustment. Poland designed its reforms to limit the fiscal impact to less than 2 percent of GDP in any year, in part by permitting only persons less than 50 years of age to shift to the new system (mandatory for persons less than 30 years of age and optional for persons in between), and plans to play the privatization card as much as possible.²⁸ Latvia will await the emergence of a surplus in its reformed PAYG system. Several countries, however, have not addressed the longer-term fiscal problems as part of their pension reforms.

Simulation of alternative transition scenarios

53. This section analyzes the financial implications of a gradual transition to a *multi-pillar pension system* including a reformed PAYG pillar (1st pillar), and a mandatory, private FF pillar (2nd pillar).²⁹ Such an exercise has also been carried out by the *MLSA*, and the basic assumptions and scenarios of that study are maintained for comparative purposes. As the *MLSA* notes, determining the ratio of benefits from the new private, funded system, which are based entirely on individual contributions, to those of the public, unfunded system, which consist of a basic sum supplemented by a merit component, is one of the fundamental decisions guiding the transition and one for which a broad social consensus is required. The following *key assumptions* are made: (i) the PAYG system is reformed along the lines of Scenario II above (retirement age increases to 65 for both men and women by year 2025); (ii) non-old age pensions will continue to be paid from the 1st pillar; (iii) the current replacement rate of 45 percent is maintained, with 30 percent targeted from the reformed 1st pillar and

²⁷In this case, one would specify a certain (e.g., 2 percent) rate of contribution to the private pension funds while maintaining balance as you go in the public system. Benefits to existing retirees would be paid entirely from the public system, while future retirees would be paid first from the private pillar and topped up from the public pillar to maintain prevailing replacement rates. To the extent that the return on privately invested assets exceeds the implicit return in the PAYG system, the combined contribution rate will gradually fall below that of the pure PAYG system. Clearly, the impact on national savings would no longer be neutral (would be expected to rise), and the current working population would bear the brunt of the adjustment burden.

²⁸In contrast, the Hungarian shift is entirely voluntary, but the formula used to convert past contributions means that it is unlikely to be attractive for workers above 35–40 years of age.

²⁹The more radical alternative of full privatization as in Kazakhstan or Chile is not examined here.

15 percent from the new 2nd pillar; (iv) the total contribution rate is unchanged and split between the PAYG and private pillars so as to ensure long-run equilibrium in the latter; and (v) the public pension deficit is financed through debt issuance at an interest rate corresponding to the return on private pension portfolios.

54. Two alternative, *gradual transition* scenarios are examined (depending on the *cut-off age*; persons above the cut-off age remain in the existing (reformed) PAYG system (both as far as contributions and benefits are concerned), while persons below the cut-off age are transferred to the new multi-pillar system (contributions and benefits split between the new 1st and 2nd pillars): *Scenario III*: Single generation transformation period in which the cut-off age is set at 40 years; and *Scenario IV*: Two-generation transformation period in which the cut-off age is set at 20 years.³⁰

55. In *Scenario III*, contributions to the existing PAYG system will be reduced substantially as all persons below the age of 40 years transfer to the new system and will be phased out entirely over the next 25 years as the working population over the age of 40 years gradually retire. The payment of benefits will continue until around year 2050 when all persons in the system are dead. The first pensions from the new system will be paid in year 2025. To ensure long-run (steady-state) balance in the private pension system, a “sustainable” contribution rate of 5 percent will be required under the above assumptions, leaving 21 percent for the new PAYG pillar. As a result, a quickly widening deficit emerges in the public pension system, reaching 2 percent by 2006, 4 percent by year 2018, and 5 percent by the middle of next century (Figure 8). Public pension system debt rises unsustainably and reaches over 80 percent of GDP by year 2050 (Figure 5). Meanwhile, the deterioration in the public sector is offset by a large surplus and accumulation of assets in the private pension system, with the surplus culminating at 3 percent of GDP around year 2025 and net assets of 50 percent of GDP around year 2045 (Figures 8 and 9). Given the assumption of unchanged total contribution and replacement rates, there is no change in the total pension system balance or national savings involved in the transition to the new multi-pillar system.

56. In *Scenario IV*, the impact on public finances is less pronounced as more people remain in the existing PAYG system thus postponing the loss of contributions by a generation. In addition, the longer time period (45 years) before persons retire from the new system allows a lower contribution rate (4 percent) to the private pillar and thus higher (22 percent) to the new PAYG pillar. In this scenario, the public pension deficit is kept below 2 percent until year 2017, although eventually it reaches the same level as in the previous

³⁰Of course, one could also examine a sudden transition to the new multi-pillar system in which all persons were required to shift immediately, or alternatively a slower transition in which only new entrants to the job market would be required to join the new scheme. Such arrangements would not be materially different from the scenarios outlined above, although of course the timing and magnitude of cost would vary.

scenario and the public debt to GDP ratio converges to that of Scenario III (Figures 10 and 5). The private pension system surplus and assets correspondingly grow less rapidly, with the surplus culminating at 3 percent of GDP in year 2045 when the first people retire (Figures 10 and 9).

57. While the accumulation of private pension funds could absorb a significant increase in the stock of public debt, these scenarios are clearly not consistent with long-run fiscal viability. However, the more manageable deficits in the slow transition scenario could realistically be financed through a combination of further reforms to the PAYG system, general fiscal adjustment, and use of privatization revenues.

V. CONCLUSIONS

58. The finances of the Czech pension system have come under increasing pressure, and while they may be manageable over the medium term, the longer-term outlook is not viable in the absence of further reform. Parametric reforms to the existing structure of the Czech pension system could go a long way towards addressing its long-term financial problems. Such reforms would include notably the continued increase in retirement ages to reach 65 years for both men and women in the year 2025 in line with increasing life expectancy and the practice in most advanced countries, but should also include actuarially fair penalties for early retirement and less generous periods of non-contribution. Further, it could be considered to lower benefits by linking these to the lifetime earnings adjusted for inflation rather than wage developments as well as by indexing pensions in the same manner. Such reforms could be combined with partial pre-funding or implementation of a sustainable contribution rate, which may not need to be much higher than the current rate, especially to the extent that other parametric reforms are put in place. This would distribute more equally the burden of retirement financing across generations, and help enhance fiscal discipline by highlighting the future implications of current benefit promises. Also, measures should be taken to strengthen the link between contributions and benefits, possibly by means of notionally defined contribution accounts.

59. While the introduction of a mandatory, FF, private sector savings pillar would carry a number of potential advantages, including reduction of labor market inefficiencies, protection from political risk, and stimulus to capital market development, there would also be important risks related to inter alia future market developments and inadequate regulation. Transition to such a system, whether full or partial, would not in and by itself increase national savings or solve the underlying solvency problem of the pension system, and would be associated with a very large cash fiscal cost. While the larger fiscal deficit in principle could be accommodated as it would be offset by higher private savings, the concern to avoid an unsustainable escalation in the public debt burden would necessitate a fiscal adjustment potentially larger than that needed to fix the public PAYG system.

60. However, as the PAYG and FF systems have different comparative advantages in terms of risk protection, income distribution, etc., risk diversification and the potential benefits observed in other countries suggest that it may be worthwhile to gradually introduce

a small second pillar, while retaining reliance on the PAYG system. The fiscal problems could be addressed through a phased reform process, whereby initially the PAYG system is strengthened and the link between contributions and benefits enhanced, before supplementing it with a FF pillar. This in turn could be phased in over two generations.

Table 1. Developments in Key Pension System Indicators 1987-98.

	1987	1989	1991	1993	1994	1995	1996	1997	1998
DEPENDENCY RATIO									
Number of old age pensioners (1000) 1/	1587	1556	1487	1675	1703	1714	1696	1798	
Number of contributors (1000)				4308	4563	4547	4510	4634	
Demographic dependency ratio (percent)	0.360	0.353	0.347	0.340	0.337	0.306	0.330	0.325	
Systemic dependency ratio I (percent)	0.303	0.306	0.347	0.385	0.381	0.385	0.392	0.388	
Number of other pensioners (1000)				630	715	723	753	718	
Total number of pensioners (1000)					2419	2437	2449	2516	
Systemic dependency ratio II (all pensioners)	0.435	0.436	0.484	0.535	0.530	0.536	0.543	0.543	
Life expectancy (years)									
Men					69.5	70.0	70.4	70.6	71.0
Women					76.6	76.9	77.3	77.5	77.7
REPLACEMENT RATE									
Monthly pension benefits (average; CZK)									
Old age	1374	1598	2176	2734	3059	3578	4213	4840	
Other				3251	3259	3723	4165	5317	
Monthly wage (average; CZK)	3026	3170	3792	5817	6896	8172	9676	10696	11688
Replacement rates (percent)									
Old age	0.454	0.504	0.574	0.470	0.444	0.438	0.435	0.453	
Other				0.559	0.473	0.456	0.430	0.497	
EXPENDITURE (CZK bill.)									
Old age	39.4	43.5	56.1	81.1	92.5	108.2	126.1	152.8	168.8
Other	26.2	29.8	38.8	54.9	62.5	73.6	85.8	104.4	118.4
Disability	13.2	13.7	17.3	24.6	28.0	32.3	37.6	45.8	47.8
Partial	7.4	7.8	10.0	14.5	16.9	20.4	24.1	29.3	31
Full	5.8	6.3	8.2	12.4	14.7	17.4	20.1	24.5	
Widow(er)	1.6	1.6	1.7	2.1	2.3	3.1	3.9	4.8	
Orphans and others	5.0	4.9	6.5	9.2	10.1	10.5	12.1	14.7	14.6
Administration	0.9	0.9	0.8	0.9	0.9	1.4	1.5	1.8	2.2
Share of total expenditure (percent)				0.019	0.022	0.021	0.021	0.017	
REVENUE									
Contribution rate (percent)				0.272	0.272	0.272	0.26	0.26	0.26
Collection rate (percent)				0.974	0.974	0.961	0.953	0.946	
Pension revenue (CZK bill.)				79.7	100.0	116.5	129.8	146.3	156.3
BALANCE (CZK bill.)									
Pension revenue/GDP (percent)				7.8	8.5	8.4	8.3	8.7	8.6
Pension expenditure/GDP (percent)	8.0	8.3	7.4	7.9	7.8	7.8	8.0	9.1	9.3
Pension system balance/GDP (percent)				-0.1	0.6	0.6	0.2	-0.4	-0.7
MEMORANDUM ITEMS									
Nominal GDP (CZK bill.)	495	525	754	1020	1183	1381	1572	1680	1820.7
Average CPI inflation (percent)				20.8	10	9.1	8.8	8.5	10.7
Nominal wage growth (percent)							18	8.6	9.7
CPI index (ave 1994=100)					100	109.1	118.8	128.8	142.6
Index of real wage		100	72.2	79.6	85.8	93.1	101.3	103.3	101.9
Index of real pension value		100	81.5	75.6	76.3	80.9	87.0	92.2	
Unemployment rate (average)				3.0	3.3	3.0	3.1	4.3	6
Labor force participation rate (percent)			73.6	73.6	73.9	73.4	73.2		61.3
Men			80.4	82.1	82.3	81.5	82.1		71
Women			66.8	65.0	65.6	65.4	64.4		52.3

1/ Retirement age 60 for men and 53-57 for women (depending on number of children reared) through 1995; thereafter increase by 2 (4) months per year for men (women) until year 2007.

Table 2. Czech Republic: Macroeconomic Assumptions for Long-Term Pension System Projections.

	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
CPI inflation rate (percent)	4.4	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Real interest rate (percent)	3.5	4.5	4.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	2.5
Nominal interest rate (percent)	8.1	7.6	6.6	6.6	6.6	4.5	4.5	4.5	4.5	4.5	4.5
Labor productivity growth (percent)	3.0	4.5	4.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	2.5
Nominal wage growth (percent)	7.2	7.5	6.5	6.5	6.5	4.5	4.5	4.5	4.5	4.5	4.5
Average wage (CZK)	13,595	18,976	25,999	35,620	48,803	60,817	75,789	94,447	117,699	146,674	182,783
Unemployment rate (percent)	11.6	10	10	10	10	10	10	10	10	10	10
Labor force participation rate (percent)	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Share of labor force contributing to SS	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Real GDP growth (percent)	1.5	4.5	4.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	2.5
GDP deflator (percent)	4.4	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Index GDP deflator (1997=100)	120.2	141.9	156.7	173.0	191.0	210.9	232.8	257.0	283.8	313.3	345.9
Nominal GDP growth (percent)	6.0	7.6	6.6	6.6	6.6	4.5	4.5	4.5	4.5	4.5	4.5
Nominal GDP (CZK bill.)	2001	2902	3992	5493	7558	9441	11794	14732	18403	22988	28716

Source: Fund staff (unofficial) projections.

Table 3. Czech Republic: Characteristics of Public Pension Schemes in Selected Countries

	Financing	Contribution rate	Retirement age (Men/Women)	Contribution period for full pension	Early retirement penalty	Substitution periods	Assessed earnings	Benefit accrual rate	Indexation of benefits
Czech Republic	PAYG	26	[62/57-59]	25	Max. 3 years 5/	4/ plus educ.	[Last 30 years]	1.50	Prices/real wages
Selected transition economies									
Hungary	PF	30.5	[62/62]	40	Max. 3 years				Prices/gross wages
Poland	PF	(31--total)	[65/60]	NDCA			Min. 25 pct. ave.		Prices
Croatia									
Latvia	PF	20	60/55 (min.)	10 (NDCA)					Prices [wages]
Kazakstan	FF	25.5	[63/58]	25/20			60 pct. of high		"Collection index"
Selected EU countries									
Germany	PAYG		65/60 [65/65]	40			Career	1.50	Net wages
France	PAYG		60/60	38			Best 12 years	1.75	Prices/gross wages
Italy	PAYG		62/57	40			Last 5 years	2.00	Prices
United Kingdom	PAYG		65/60	50			Career	0.40	Prices
Sweden	PF		65/65	30			Best 15 years	1/	Prices
Austria	PAYG	22.8	65/60 (59/57)	40	3/	4/	Best 15 years	2.1-1.6	Net wages
United States	PF		65/65	35			Career	2/	
Japan	PF		60/55	40			Career	0.75	

Sources: Cangiano et. al. (1998) and other sources.

1/ Declines as number of contribution years increases.

2/ Increases as assessed earnings decline.

3/ Replacement rate lowered by 1.5-1.9 percentage points per year of early retirement.

4/ Unemployment, military service, child rearing.

5/ Pension reduced by 2.4 percent of the calculation base per year of early retirement.

() actual

[] legislated phased change

Figure 1. Czech Republic: Systemic Dependency Ratio

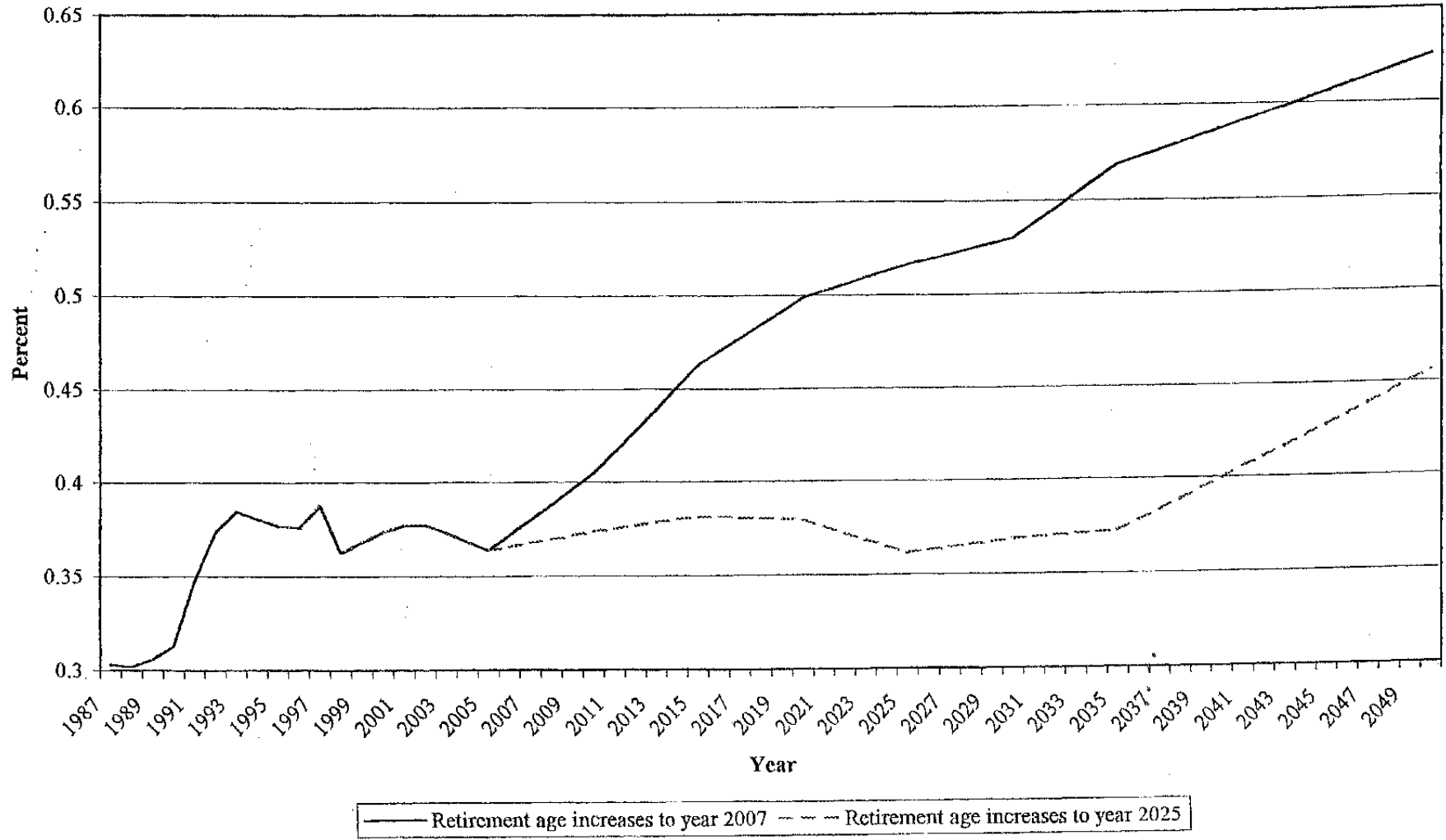


Figure 2. Czech Republic: Pension System Deficit

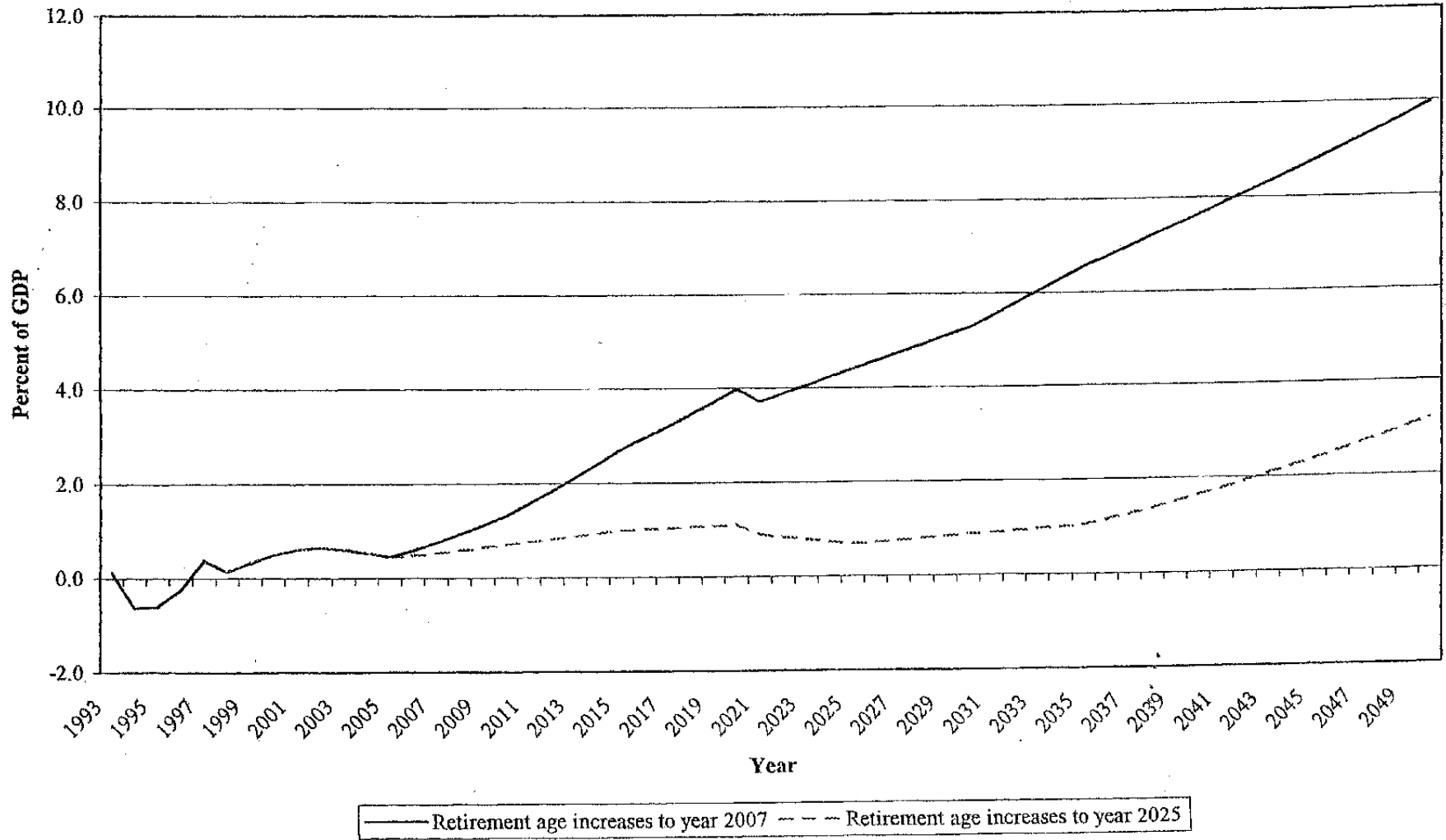


Figure 3. Czech Republic: Equilibrium Contribution Rate

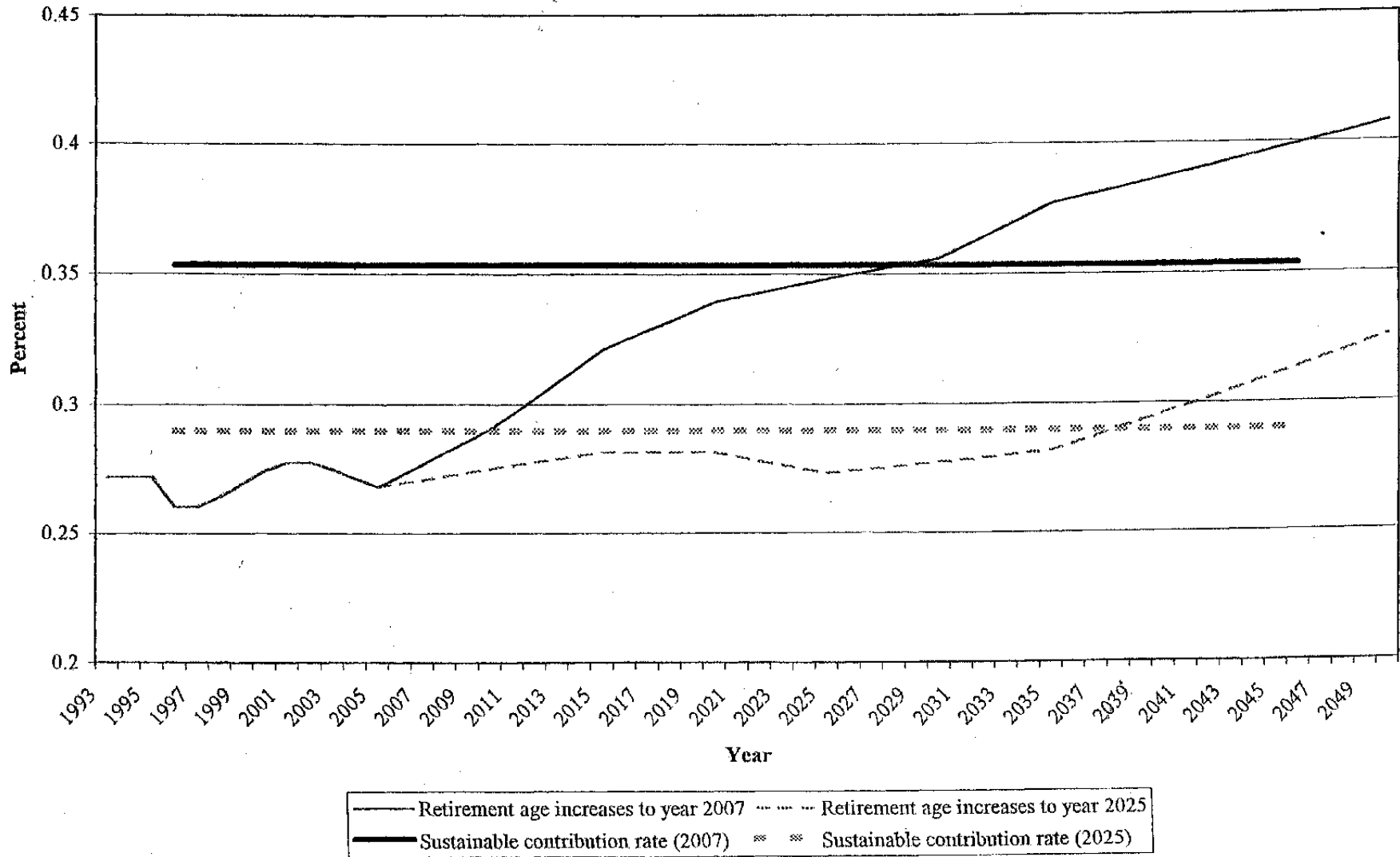


Figure 4. Czech Republic: Equilibrium Replacement Rate

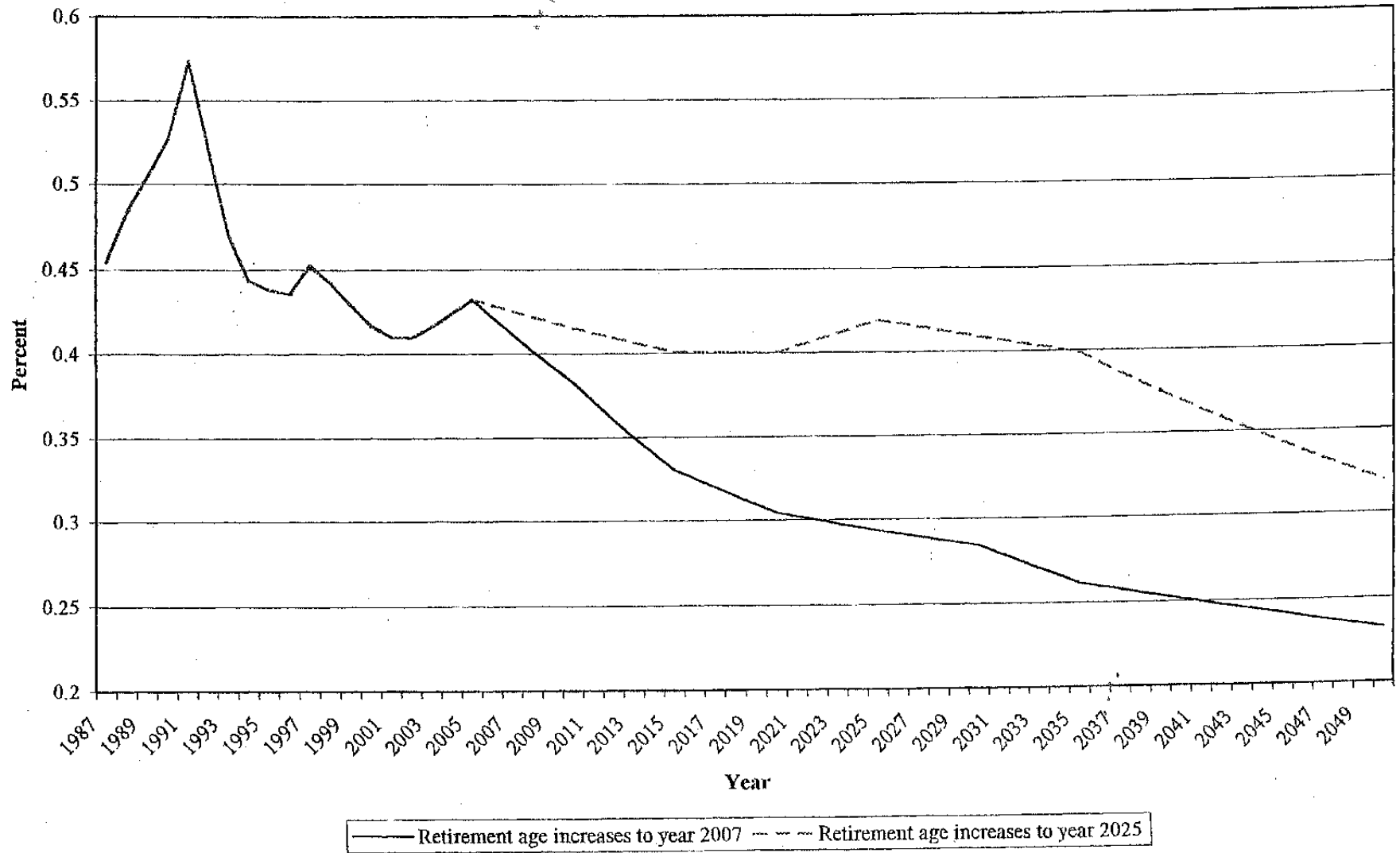


Figure 5. Czech Republic: Public Pension Debt under PAYG and Transformation to Multi-pillar System

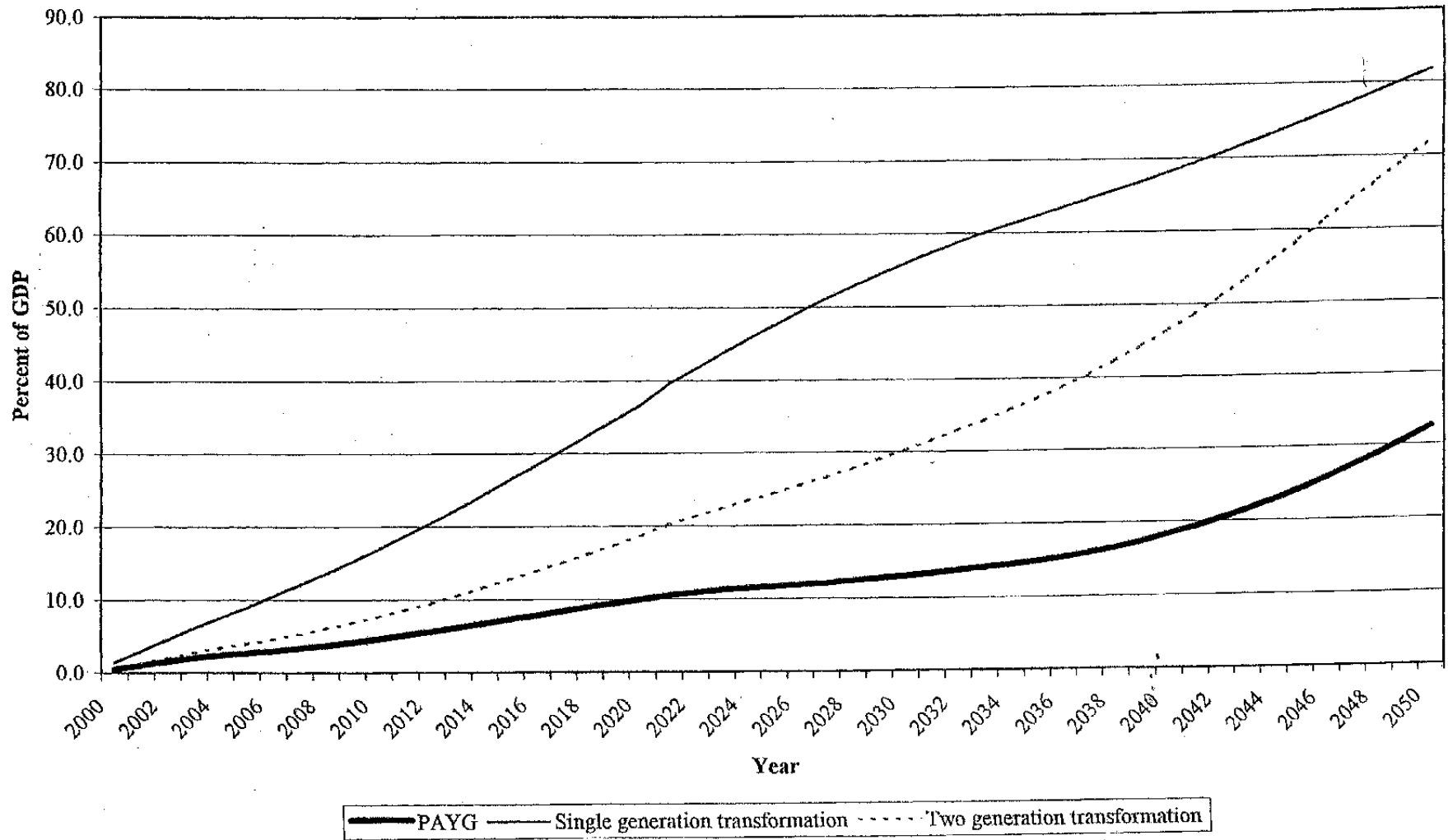


Figure 6. Czech Republic: Public Pension System Balance under Pre-funding

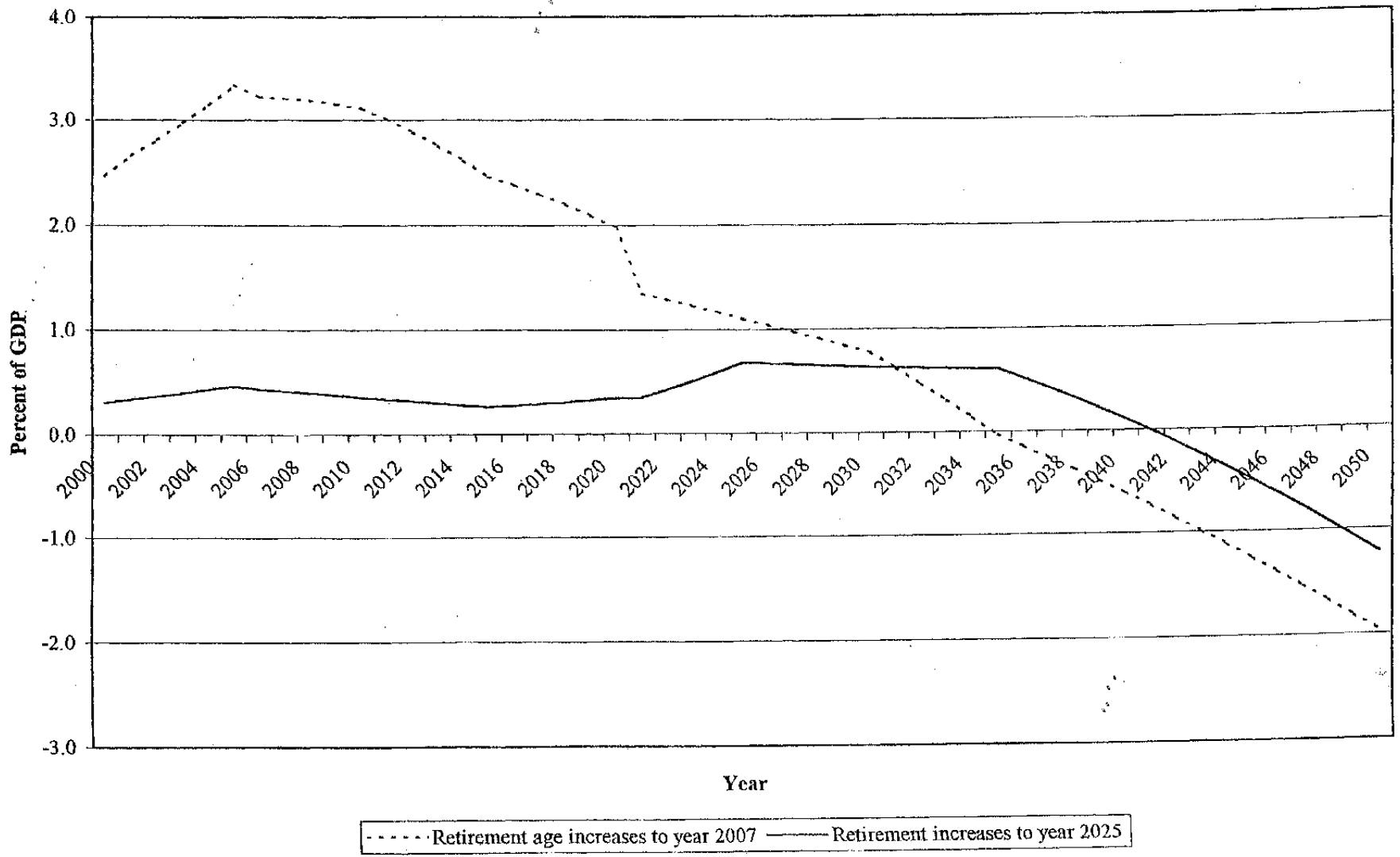


Figure 7. Czech Republic: Asset Position of Public Pension Fund under Pre-funding

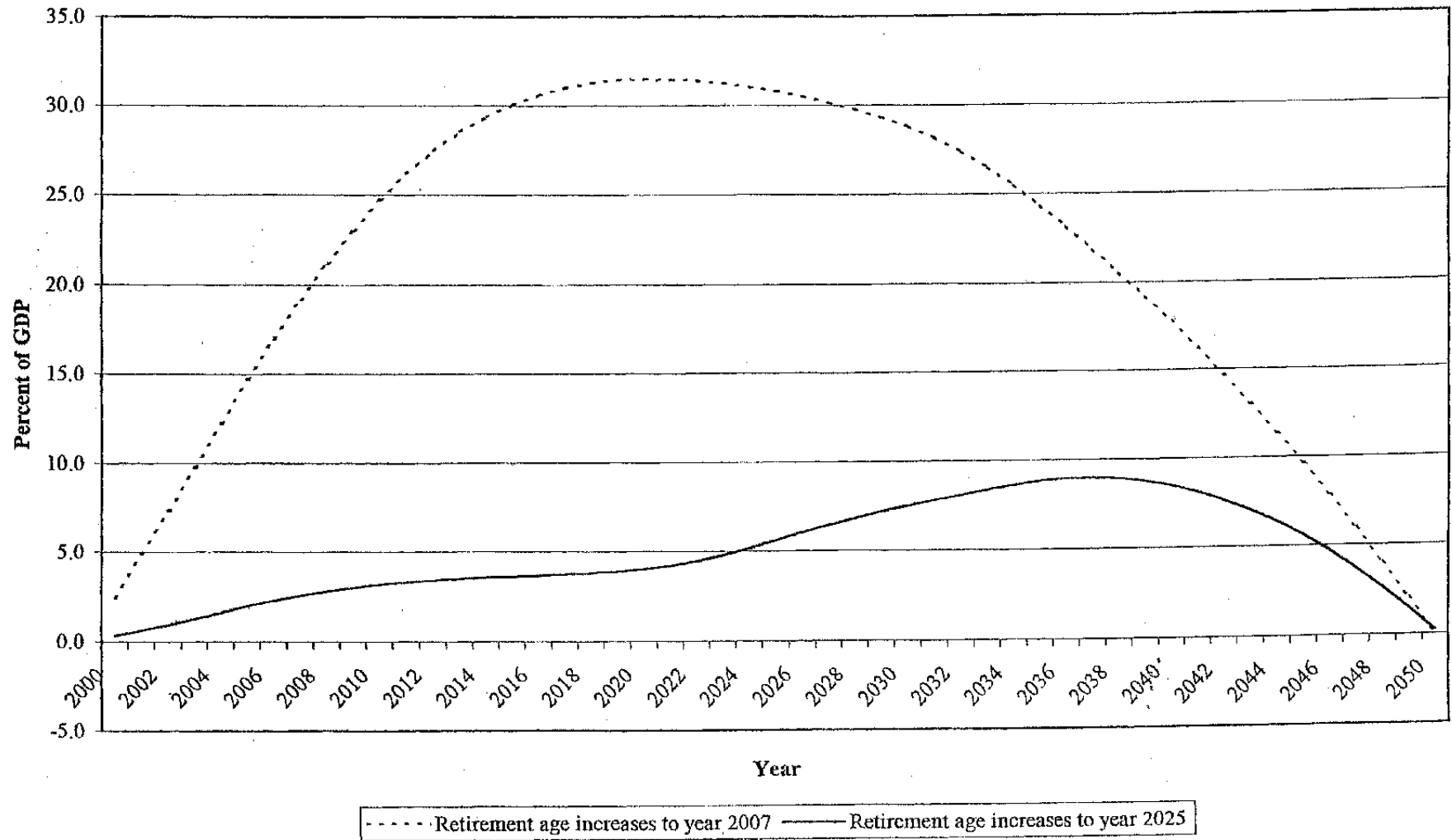


Figure 8. Czech Republic: Private and Public Pension System Savings (single generation transformation)

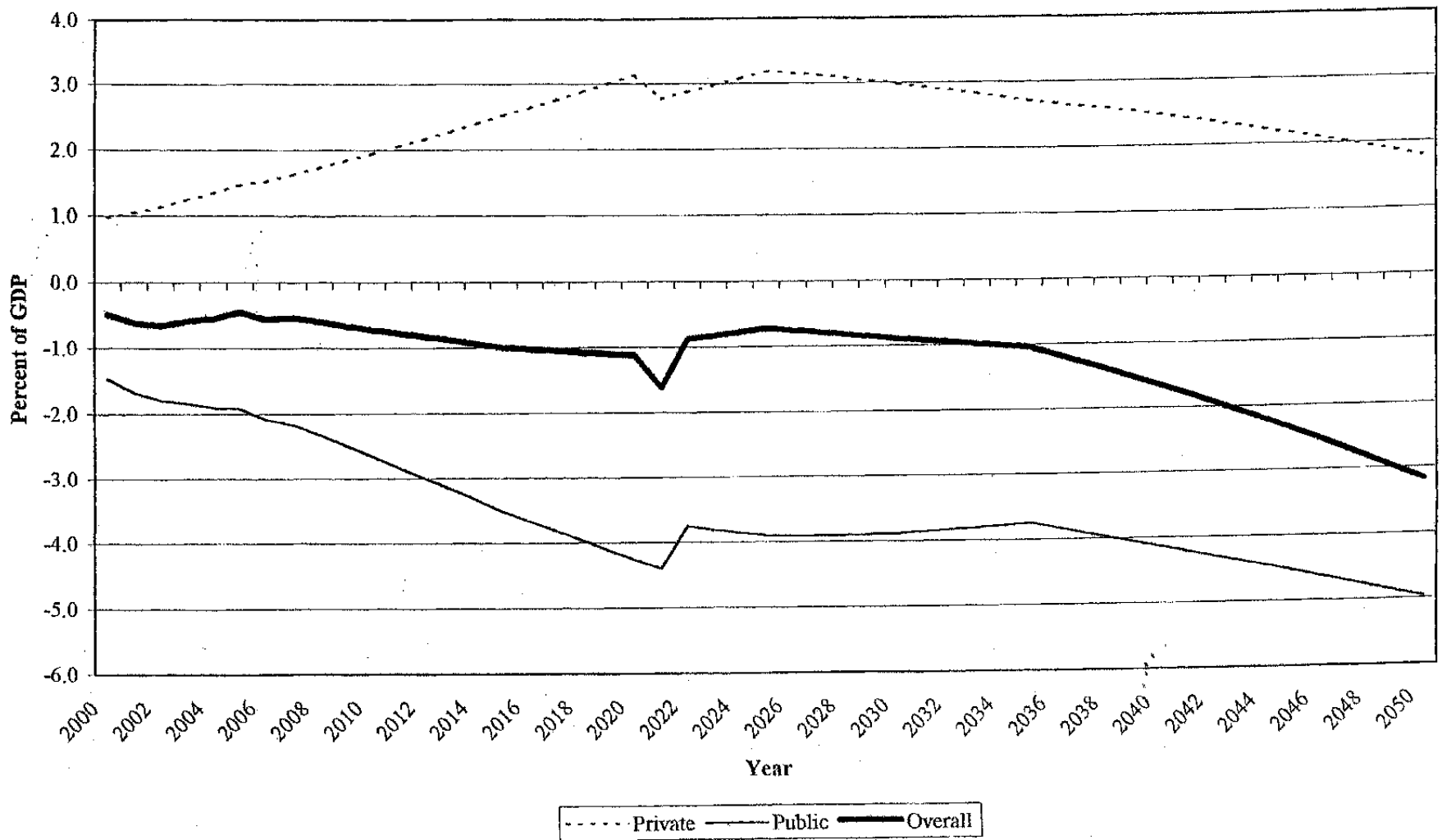


Figure 9. Czech Republic: Net Private Pension Fund Assets

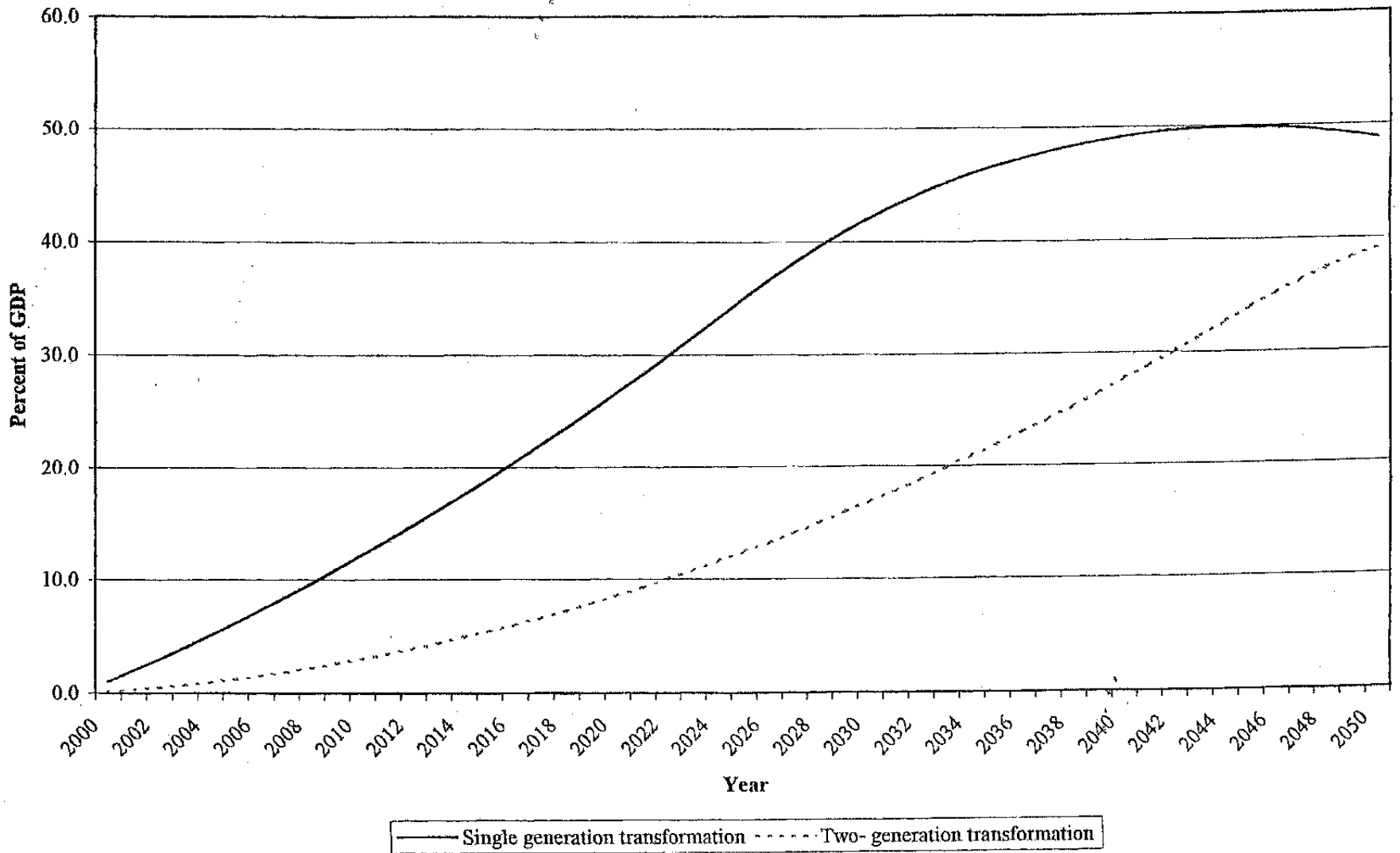
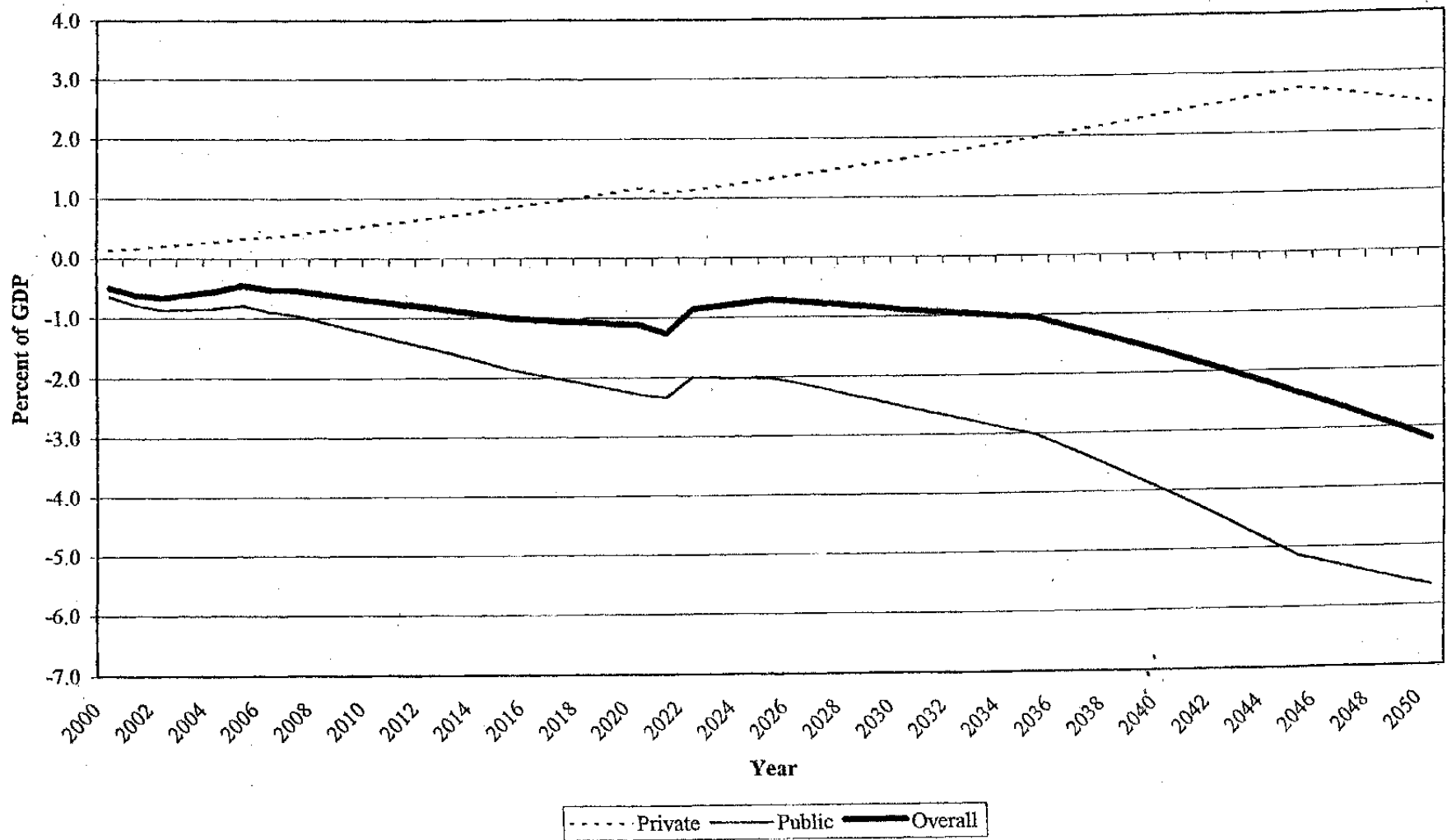


Figure 10. Czech Republic: Private and Public Pension System Savings (two-generation transformation)



REFERENCES:

- Cangiano, C., C. Cottarelli, and L. Cubeddu (1998): "*Pension Developments and Reforms in Transition Economies*". IMF Working Paper 98/151 (October).
- Chand, S. K. and A. Jaeger (1996): "*Aging Populations and Public Pension Schemes*". IMF Occasional Paper No. 147 (December).
- Clavijo, S. (1998): "*Fiscal Effects of the 1993 Colombian Pension Reform*". IMF Working Paper 98/158 (November).
- Cubeddu, L. (1998): "*The Intragenerational Redistribution Effects of Unfunded Pension Programs*". IMF Working Paper 98/180 (December).
- de Castello Branco, M. (1998): "*Pension Reform in the Baltics, Russia, and other Countries of the Former Soviet Union (BRO)*". IMF Working Paper 98/11 (February).
- Feldstein, M. (1997): "Transition to a Fully Funded Pension System: Five Economic Issues". NBER Working Paper 6149 (August).
- Fischer, S., R. Sahay, and C. Vegh (1998a): "*From Transition to Market: Evidence and Growth Prospects*". IMF Working Paper 98/52 (April).
- Fischer, S., R. Sahay, and C. Vegh (1998b): "*How Far is Eastern Europe from Brussels?*" IMF Working Paper 98/53 (April).
- Geanakoplos, J., D.S. Mitchell, and S.P. Zeldes (1998): "*Would a privatized Social Security System Really Pay a Higher Rate of Return?*" NBER Working Paper No. 6713 (August).
- Griffith-Jones, S. (1998): "*Reforms of the Pension System and National Savings*". Czech National Bank Institute of Economics Working Paper No. 84.
- Heller, P.S. (1998): "*Rethinking Public Pension Reform Alternatives*". IMF Working Paper 98/61 (April).
- Hemming, R. (1998): "*Should Public Pensions be Funded?*". IMF Working Paper 98/35 (March).
- Holzman, R. (1997): "Fiscal Consequences of Moving from Unfunded to Funded Pensions". OECD (August).
- IMF (1995a): "*Czech Republic—IMF Economic Reviews I 1995*." (April).
- IMF (1995b): "*Czech Republic—Selected Background Studies*." SM/95/171 (July).

- IMF (1997c): "*Germany—Selected Issues*". SM/97/206 (August).
- IMF (1997d): "*Assessing the Fiscal Stance in the Context of Privatizing a Public Pension System*". SM/97/108 (May).
- IMF (1999): "*Czech Republic—Selected Issues*". SM/99/157 Supplement 1 (July).
- Jelinek, T. and O. Schneider (1997): "*Time for Pension Reform in the Czech Republic*". Transition (June).
- Koch, M. and C. Thimann (1997): "*From Generosity to Sustainability: The Austrian Pension System and Options for its Reform*". IMF Working Paper 97/10 (January).
- Levy, J. (1995): "*Some Considerations Relevant to Pre-funded Pensions in France*". IMF Working Paper 95/64 (June).
- MacKenzie, G.A., P. Gerson, and A. Cuevas (1997): "*Pension Regimes and Saving*". IMF Occasional Paper No. 153 (August).
- Ministry of Labor and Social Affairs, Czech Republic (1998a): "*Pension System in the Czech Republic*" (Pamphlet) and various background material.
- Ministry of Labor and Social Affairs, Czech Republic (1998b): "*Analysis of Pension Insurance and Proposed Conceptual Scenarios*". Working document submitted to Cabinet (March).
- OECD (1988): "*Reforming Public Pensions*". OECD Social Policy Studies No. 5.
- OECD (1997): "*Labor Force Statistics 1976-96*".
- Ruggiero, E. (1996, 1997): "*Structural Pension Reform in Hungary*". In "Hungary: Selected Issues", SM/97/218 and SM/96/207 (August).
- Sadka, E. and V. Tanzi (1998): "*Increasing Dependency Ratios, Pensions, and Tax Smoothing*". IMF Working Paper 98/129.
- Schneider, O. (1997): "*Dynamic Simulation of Pension Reform*". Charles University Research Paper (September).
- Van den Nord, P. and R. Herd (1994): "*Estimating Pension Liabilities: A Methodological Framework*". OECD Economic Studies, No. 23 (Winter).
- World Bank (1994): "*World Population Projections 1994-95*".

World Bank (1999): *Czech Republic: "Capital Markets Review"* . A World Bank Country Study (May).