Nikola Altiparmakov*

**IS THERE AN ALTERNATIVE TO THE PAY-AS-YOU-GO PENSION SYSTEM IN SERBIA?**

**ABSTRACT:** International pension reform experiences indicate that, amid demographic aging, each country needs to identify the reform policies most suited to its own economic and social environment. The economic analysis in this paper suggests that a potential prefunding of the Serbian pension system, either through a public pension reserve fund or mandatory private pension funds, would yield an economic performance inferior to the existing PAYG financing. If a wealth transfer from current to future generations is desirable from the macroeconomic or social perspective it should be implemented through repayment of outstanding public debt, not through pension system prefunding. Pension reform efforts should thus focus on parametric PAYG changes and adequate integration of voluntary retirement saving vehicles into the Serbian pension system.

**KEY WORDS:** pension prefunding, pay-as-you-go financing, capital markets

**JEL CLASSIFICATION:** H55, E21
1. INTRODUCTION

The pension system in Serbia is based on the principle of intergenerational solidarity and Pay-As-You-Go financing: pension payments to current pensioners are financed from the pension contributions of current employees. Most countries in Europe and in the world also have public PAYG pension systems based on intergenerational solidarity. When public pension systems were formed - in the early 20th century in most countries - opting for pay-as-you-go financing was a logical choice, due to the high fertility rates in those times. However, since then most of the world has experienced demographic aging; life expectancy has significantly increased, while fertility rates have declined to levels which no longer enable even simple population reproduction in most European countries.

Since demographic aging is creating financing challenges for PAYG pension systems, some economists have been arguing over the years that (partial) pension system funding might be a panacea for the demographic aging phenomenon. In fact, a common belief has been created in the general public that funded pension systems are a-priori superior to PAYG systems. This article explores differences and similarities between PAYG and funded pension systems and presents an economic framework for comparing their performance, based on the well-known Samuelson-Aaron Theorem. Furthermore, we explore the issue of transition costs that arise when a country undergoes (partial) funding of a mature PAYG system. We explore international experiences with the two most common approaches to pension system prefunding - establishment of public pension reserve funds and introduction of mandatory private pension funds.1 After reviewing the theoretical background and empirical evidence we try to answer the following question: would Serbia benefit from partial pension system prefunding and would it be able to bear the associated transition costs?

We restrict our attention in this article to mandatory aspects of pension system design and do not explore voluntary (tax-prefered) retirement saving vehicles. Voluntary retirement savings are becoming an increasingly important aspect of pension systems in many countries, including Serbia. While voluntary retirement saving vehicles can produce significant economic benefits, they are mostly restricted to citizens with above-average living standards that can afford to make additional retirement savings. Thus, analyzing the design of voluntary retirement

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1 Mijatović (2008) advocates the establishment of public pension reserve fund in Serbia, few authors including Ilić (2006) have advocated the introduction of mandatory private pension funds, while Matković et. al (2009) question the feasibility of mandatory private pension funds in Serbia.
saving vehicles and their interaction with the rest of the pension system requires exploring additional issues, such as behavioural responses and adverse income redistribution concerns (Altiparmakov, 2010).

This paper is organized in the following manner: Section 1 presents the theoretical framework for comparing PAYG and (fully-)funded pension systems. The following sections present international experiences with the two most common approaches to prefunding: establishment of public pension reserve funds in developed OECD countries (Section 2) and introduction of mandatory private pension funds in emerging European countries (Section 3). Relevant lessons for Serbia are drawn in Section 4. Concluding remarks are presented in Section 5.

2. THEORETICAL FRAMEWORK FOR COMPARING THE PERFORMANCE OF PAYG AND FUNDED PENSION SYSTEMS

A common belief that is often encountered in the general public is that funded pension systems are a-priori superior to PAYG pensions systems, because contributions to funded systems are invested for a long period of time, while contributions to the PAYG system are immediately expensed to pay pensions for current pensioners. In fact, both PAYG and funded pension systems have investment features: PAYG systems implicitly invest in human capital, while funded pension systems explicitly invest in securities and physical capital. Thus, when making performance comparisons, one needs to compare the implicit PAYG rate of return with the explicit rate of return on capital in the funded pension system. The Samuelson-Aaaron Theorem states that the funded pension system is more (Pareto) efficient than a PAYG pension system only if it can yield a rate of return on capital that is higher than the GDP growth rate (Samuelson, 1958; Aaron, 1966). Otherwise a PAYG pension system should be chosen, as it is more efficient and is able to generate higher pension benefits for the same amount of pension contributions made.

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2 The Samuelson-Aaron Theorem actually refers to the growth rate of covered wages in the economy, which can be approximated with the GDP growth rate for all practical purposes. Both of these growth rates are driven by productivity growth (per worker) and the growth of the working population. As Settergren and Mikula (2005) stress, the Samuelson-Aaron theorem holds when the population is at a steady state. Increasing life expectancy, present in most countries, actually makes the PAYG IRR slightly larger than the GDP growth, but we will (conservatively) ignore this issue in the rest of this paper.
When public pension systems were established in the early 20th century, choosing PAYG financing was a logical decision due to the high fertility rates in most countries, which were believed to be sustainable and would therefore enable high implicit PAYG rates of return. However, most of the world has experienced significant demographic aging since then: life expectancy has increased significantly while fertility rates have declined rapidly to levels which no longer enable even simple population reproduction in most European countries. On the other hand, returns on capital (equity in particular) experienced extravagant growth in the second half of the 20th century – significantly higher than GDP growth. Thus, some economists have been advocating moving from PAYG to (partially) funded pension systems in order to solve, or at least tame, challenges arising from the demographic aging phenomenon.

It should be stressed that the Samuelson-Aaron Theorem provides a criterion for choosing a Pareto optimal financing in the case of a country not having any pension system in place already. However, when a country is already running a mature PAYG pension system, which is the case with basically all European countries, then performance comparisons need to take into account the significant, multi-decade transition costs that arise from the need to finance two pension systems in parallel – provide payments to existing PAYG pensioners and prefund resources for the future retirement of existing workers. In this case, it is impossible to define a Pareto criterion for whether (partial) pension system prefunding is desirable or not, since some population cohorts have to bear the transition burden and be worse off in order for other population cohorts to potentially benefit from this action (Orszag and Stiglitz, 1999; Diamond, 2002).3

Boldrin et. al (1999) conclude that “any transition to fuller funding is fundamentally an issue of intergenerational redistribution”. One must thus resort to social norms in order to define a suitable criterion for deciding whether or not to undertake (partial) prefunding of a mature PAYG pension system. However, it is obvious that in this case expected returns on capital need to be significantly higher than GDP growth in order to justify bearing the transition costs. For example,

3 A few authors, including Kotlikoff (1998) and Breyer and Straub (1993), use dynamic general equilibrium models to identify circumstances when moving from PAYG to a fully-funded pension system might be Pareto improving for all generations. However, potential Pareto improvements are actually not achieved by the pension reform per se, but by an accompanying efficiency-driven tax reform (moving from payroll taxation to consumption or lump-sum taxation) that is conducted in order to finance the transition costs. If such Pareto improvements were indeed feasible in reality, this tax reform should be undertaken irrespective of pension reform efforts.
Altiparmakov (2011) applies some common financial feasibility calculations to show that Serbia should dismiss outright the idea of pension system funding via the introduction of mandatory private pension funds if those funds cannot be expected, with great certainty, to yield net rates of return at least 1.8% above GDP growth throughout the entire 21st century.

Lastly, it should be mentioned that funded pension systems are far from being immune to the demographic aging phenomenon. Increasing life expectancy means that contributors are over time receiving lower pension entitlements for the same amount of accumulated pension savings – unless they are postponing retirement in line with life expectancy increases. Furthermore, there is abundant statistical evidence that demographic trends influence asset returns, so that demographic aging could be expected to reduce the high rates of return on capital which have been experienced during recent decades (Brooks, 2000; Abel, 2003). Of course, capital could be invested abroad in young developing economies, in order to diversify returns on pension assets and avoid aging-induced decline in the rate of return on capital in the domestic economy. However, identifying young developing economies is an increasingly difficult task, as Barr and Diamond (2009) show that projected 2050 population pyramids are basically identical for the United States, which had a baby-boom, China, which had a one-child policy, and India, which had neither. Thus we conclude that demographic aging is creating financing challenges for funded pension systems as well, although in a less obvious manner than with PAYG systems. This means that the potential benefits of partial prefunding and diversification of retirement financing sources are limited by the fact that economic and demographic developments affect both the returns to labour and the returns to capital.

Many developed and emerging countries have started to partially prefund their pension systems during the last couple of decades. However, their prefunding approaches have been drastically different. Most developed OECD countries opted to maintain their PAYG systems and to strenghten their sustainability by establishing or modernizing existing public pension reserve funds. On the other hand, most emerging economies in Latin America and Eastern Europe decided on a more radical approach: they have partially privatized their existing public PAYG systems, replacing them with mandatory private fully-funded pension funds. Different prefunding approaches chosen by developed and emerging countries can be explained by the differences in their institutional capacities, and also by the different ambitions driving the reforms.
3. INTERNATIONAL EXPERIENCES WITH PUBLIC PENSION RESERVE FUNDS

Around the turn of the millennium many developed OECD countries established or modernized existing public pension reserve funds (PPRFs) in response to clear actuarial warnings that their PAYG systems were not sustainable amid demographic aging in the long run. The main objective of prefunding via PPRFs was to implement tax-smoothing over the long-term horizon (basically over most of the 21st century) and distribute the aging fiscal burden equitably across current and future generations. Most countries have envisaged significant prefunding contributions in the period up to 2020 and then gradual withdrawal of accumulated funds, since most significant aging-related fiscal pressures are projected to occur in the 2020-2050 period when ‘baby-boomers’ in most OECD countries will have retired. It is worth exploring some of the most relevant prefunding plans implemented by OECD countries (Yermo, 2008; Vittas et.al. 2008).

- Sweden modernized its PPRF in 2000, which had been functioning since 1960, in order to improve performance and limit the influence of social and political objectives on investment decisions. Sweden opted for a unique approach whereby four separate PPRFs were established in order to foster competition and improve performance. Total PPRF assets have reached about 30% of GDP, or 3.8 times annual pension payments in 2009 – the year in which the PAYG system went into deficit, which is expected to persist for the next forty years, during which the Swedish pension system will make withdrawals from accumulated PPRF assets.

- Canada also modernized PPRF investment procedures in 1997 to improve performance, since surplus funds had been invested solely in government securities since the establishment of the Canadian PPRF in 1965. Furthermore, the decision was made to gradually increase pension contributions from 5.9% to 9.9% of gross salaries, in order to accumulate significant PAYG surpluses until 2020 and adequately prefund the Canadian pension system. At the end of the prefunding period, PPRF assets are forecasted to equal 4.3 times the annual pension payment.

4 Surpluses, and consequently public pension reserves, have existed in many countries in the early decades of PAYG systems, before these schemes have matured. However, those reserves were modest in size and were not designed to represent an actuarial buffer against demographic aging. Furthermore, these initial surplus assets were not managed properly and were solely invested in government securities.

5 Besides establishing PPRFs, pension reforms in OECD countries have also included PAYG parametric changes (Martin and Whitehouse, 2008).
Norway created the Global Government Pension Fund in 1997. The Global Fund is financed from petroleum extraction proceeds and is designed to alleviate aging pressures on the public pension system in the coming decades. Although most countries do not have a rich accumulations of natural resources that they can use to prefund pension liabilities, the Norway case study is included in this paper because relevant lessons can be drawn from its asset management practices.

New Zealand established the Superannuation Reserve Fund in 2001, which will receive annual contributions from the government equal to about 0.75% of GDP until 2025, while withdrawals from the fund are forbidden before 2020. The superannuation fund is expected to accumulate assets higher than 30% of GDP by 2025. The goal is to achieve tax-smoothing over the forty-year horizon.

Ireland established the National Pensions Reserve Fund in 2001, which will receive annual contributions from the government equal to 1% of GNP until 2055. Accumulated funds cannot be withdrawn before 2025, when the fund is expected to accumulate assets above 40% of GDP.

France established the Pension Reserve Fund in 1999, which will receive funding from various sources (PAYG surpluses, government transfers on an ad-hoc basis, specific fees and taxes). Assets will be accumulated until 2020 and used to finance projected PAYG shortfalls from 2020 to 2040. The design of the French PPRF has been repeatedly criticized for being under-funded due to annual contribution targets of only 0.2% of GDP, with the target fund value in 2020 equaling only 5% of GDP.6

These prefunding plans basically prescribe that current generations are to bear a significant portion of the transition costs associated with the move from (predominantly) PAYG to a partially funded PAYG system. In the absence of this prefunding, future generations would have to bear the entire aging burden on their own, after baby-boomers retire and demographic pressures escalate in the 2020-2050 period. For example, actuarial projections in Canada showed that in the absence of partial prefunding, the pension contributions rate would have to increase from 5.9% in 1997 to 14.2% of gross wages in 2030. Such a large increase was deemed socially unacceptable, and after a long public discussion Canadians decided to implement partial pension system prefunding in order to achieve an equitable distribution of the aging burden across current and future generations. Similar arguments prevailed in the other OECD countries that opted for partial

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6 Some PPRFs have also received one-off privatization proceeds – privatization of state Telecom in Ireland or sale of licences for third generation cellular phones in France. However, these privatization proceeds are marginal in size compared to the total prescribed prefunding commitments.
pension system prefunding. For example, the European Commission (2001) similarly projected that the average contribution rate in the EU would have to increase from 16% in 2000 to 27% in 2050 in order to honour pension liabilities in the existing pure PAYG systems. Vibrant economic growth in the nineties provided a good living standard, which made it easier for these societies to make a sacrifice by allocating a portion of their wealth for the benefit of future generations.

3.1. Public Pension Reserve Fund Investment Policies

When analyzing the structure of PPRF assets it is important to single out possible investment in domestic government bonds. In the context of PPRF, investing in domestic government bonds does not represent a genuine prefunding and accumulation of capital but a disguised PAYG financing, whereby contributors are interchanged with taxpayers and implicit pension liabilities are interchanged with explicit government debt liabilities. Furthermore, PPRF investment in domestic government bonds introduces the possibility of political manipulation of investment decisions. For example, the United States have been prefunding their pension system since 1983, but all PPRF resources are being invested solely in domestic government bonds. Many authors are arguing that this arrangement in essence represents a PAYG system hidden behind accounting conventions. For this reason we will not explore the United States’ experience further in this article, nor the experience of other countries where PPRFs invest mostly or exclusively in domestic government bonds, as we do not consider these arrangements to represent genuine pension system prefunding. On the other hand, the PPRF in Ireland, for example, is explicitly forbidden from investing in domestic government securities.

Regarding geographic asset allocation, it should be noticed that the PPRF in Norway is mandated to exclusively invest in foreign assets. Most PPRF assets in Sweden, Ireland, and New Zealand are also being invested abroad. However, domestic investment in these countries is higher than the share of domestic capital markets in the overall world capital market, which implies the presence of home bias in investment decisions. Home bias is even more evident in the case of France and Canada, where less than half of assets are invested abroad, due to political considerations and pressures from labour unions to further improve domestic living standards. Since around the turn of the millenium most OECD countries enjoyed good living standards with little structural unemployment, their macroeconomic conditions were favourable for investing most of the PPRF assets abroad. This would arguably represent the best allocation of overall
PAYG-PPRF pension assets, as investing in other economies, especially young developing ones, would hedge demographic and economic developments in their domestic economies. This macroeconomic opportunity has obviously been only partially exploited, due to political considerations and home bias in investment decisions. This home bias can be expected to result in the suboptimal portfolio allocation of pension assets and lower returns to future pension beneficiaries.

The institutional arrangements and organization of PPRFs is somewhat different in the countries under study (Yermo, 2008), but all countries prescribe management mandates to achieve optimal investment performance and to ignore any non-market considerations such as social or political preferences. Centralized administration and management of PPRFs has enabled low operating costs in all these countries. The total administrative and investment management costs in 2008, expressed as a percentage of assets, ranged from about 0.1% in Norway and Canada, between 0.1% and 0.15% in Sweden, and about 0.2% in France and Ireland. New Zealand’s relatively high operating costs of about 0.6% are somewhat of an outlier, in part due to the significant presence of expensive active investment practices.

PPRFs in Canada, Norway, and Sweden are mostly following the growth portfolio strategic allocation with 60% of assets held in equities and 40% in bonds. France has been following a more conservative 50% equities 50% bonds strategy, while Ireland and New Zealand have opted for more aggressive investment strategies, with 80% of assets in equities and 20% in bonds. Not all countries have explicit long-term performance targets, but those that do target the real rate of return of about 4% in the long run. Norway and Canada use the 4% real return target, New Zealand targets slightly above 4%, while PPRFs in Sweden have real return targets of between 4% and 4.5%.

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7 Furthermore, investing exclusively abroad completely eliminates the possibilities for politicization of PPRF investment decisions.

8 In response to these concerns, Canada has constantly increased investment in foreign assets since the modernization of its PPRF in 1997.

9 New Zealand is targeting 2.5% over the risk-free rate of return, which translates into a real return target of slightly over 4%.
Table 1. Performance of PPrFs in selected OECD countries, in %

<table>
<thead>
<tr>
<th>Country</th>
<th>Starting from</th>
<th>Until end-2007</th>
<th>Until end-2012</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Real Returns</td>
<td>GDP growth</td>
<td>Diff</td>
</tr>
<tr>
<td>Norway</td>
<td>Jan 1997</td>
<td>4.3</td>
<td>2.7</td>
<td>1.6</td>
</tr>
<tr>
<td>Canada</td>
<td>Mar 1999</td>
<td>4.9</td>
<td>3.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Sweden</td>
<td>Jan 2001</td>
<td>3.4</td>
<td>3.0</td>
<td>0.3</td>
</tr>
<tr>
<td>Ireland</td>
<td>Apr 2001</td>
<td>2.2</td>
<td>5.1</td>
<td>-2.9</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>3.7</td>
<td>3.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on official national PPrF authorities. Data for Sweden refers to AP1 through AP4 national pension funds.

We highlight the fact that average growth rates in Table 1 represent the theoretically appropriate geometric averaging. Many authors inappropriately rely on the simple arithmetic averaging which overstates actual growth rates. The discrepancy between geometric and arithmetic averaging increases with the variability of the underlying data. Thus, the effect of overstated growth rates is particularly noticeable with pension fund returns, since market returns are inherently volatile and more variable than GDP growth. Using arithmetic averaging would overstate pension fund returns until the end of 2012 by 0.7 percentage points, while the overstatement of GDP growth would be only 0.2 percentage points. Thus, in this paper we will be relying exclusively on the theoretically appropriate concept of geometric averaging.

Assessing how successful PPrFs have been in achieving their performance targets is challenging, since about one decade of data is a relatively short period of time in the context of the long-term pension investment horizon. Furthermore, all PPrFs experienced extremely adverse performance in 2008 due to the world financial crisis, but rebounded in 2009 and 2010. We can observe from Table 1 that Canada and Norway were successful in achieving the 4% real return target before the occurrence of the world financial crisis in 2008. However, thus far only the Canadian PPRF has rebounded enough to get back on track with this long-run target. Overall we can conclude that international practice indicates a 4% real rate of return as a reasonable estimate for long-term returns on a well diversified portfolio of international pension assets. However, there are significant downside risks that this estimate might be overly optimistic, since Canada is

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10 The overstatement effect is particularly strong in Sweden and Ireland, about 1 percentage point, due to very volatile pension fund returns in these countries.
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the only country that has thus far been able to maintain a performance close to the 4% real return benchmark. Furthermore, additional downside risks are present due to the potential negative effects that demographic aging could exert on capital returns in the coming decades. These concerns have recently lead the management of the Canadian PPRF to reduce the real return target from 4.2% to 4%. Financial experts in Norway are questioning even the 4% target, arguing that the sustainable long-term real rate of return might be closer to the 3% target.

The 4% real rate of return is higher than the projected GDP growth rates of the mature OECD economies, which stand in the 2% to 3% range. Thus PPRF returns were expected to outperform the existing PAYG pension components. This indeed has been the case in Norway, Canada, and Sweden, as we can see in Table 1. However, as mentioned earlier, the driving force behind pension prefunding in OECD countries was the desire for tax-smoothing over current and future generations and preservation of existing public pension schemes. The expected superior performance of PPRF returns over implicit PAYG returns should be considered as an additional benefit, but not as the major driving force behind the prefunding plans in these countries.

It should be noticed that the current world economic crisis profoundly negatively affected pension prefunding efforts in Ireland and France in 2010. Due to short-term fiscal and financial pressures the governments in these two countries decided to start withdrawing the accumulated funds and using them for non-pension purposes. Ireland used most of its accumulated PPRF assets in 2010 to support its failing banking sector, while France plans to use accumulated assets to finance welfare programs from 2011 onwards. Furthermore, New Zealand stopped contributing to its PPRF in 2009 and will resume with annual contributions only after the economy recovers and a fiscal surplus re-emerges. These examples go to show that, even in developed OECD countries, bearing the transition costs and honouring long-term prefunding commitments can be politically and socially very challenging, especially during economic downturns and short-term financing needs.

4. INTERNATIONAL EXPERIENCES WITH MANDATORY PRIVATE PENSION FUNDS

Prefunding arrangements in many developing countries in Latin America and Eastern Europe have been a constituent part of ambitious pension reform agendas that sought to (partially) replace public defined-benefit PAYG pension provision
with private defined-contribution fully funded pension provision. Contrary to reform efforts in developed OECD countries which sought to preserve public systems, many developing countries opted for a pension system privatization approach that would (partially) replace public PAYG systems with mandatory private pension funds (MPPFs), due to the general public's apparent dissatisfaction with the performance of public PAYG systems. This reform approach sought not only to implement tax smoothing and provide a superior rate of return on pension contributions, but also significant side-effect benefits: reducing the number of unregistered workers in the shadow economy, increasing national savings, and stimulating economic growth by developing efficient capital markets.

Although the World Bank (1994) had expressed high hopes with respect to the beneficial side-effects of pension privatization efforts, many authors have raised conceptual concerns with this approach (Beattie and McGillivray, 1995; Orszag and Stiglitz, 1999). The extent of the shadow economy and the efficiency of domestic capital markets are mostly driven by institutional factors, and pension privatization per se can hardly be expected to improve these areas. In particular, Arenas de Mesa and Mesa-Lago (2006) have shown that pension coverage has decreased, not increased, in all ten Latin American countries that implemented pension privatization in the nineties. Furthermore, the effect of pension privatization on overall national saving is ambiguous, as it depends on many factors. Although there is a fair bit of empirical evidence that the initial introduction of PAYG systems in the early 20th century partially reduced national saving (Page, 1998), it should be stressed that shifting from an existing mature PAYG scheme to a funded system is a fundamentally different scenario, involving different issues. The overall effect on national saving will critically depend on the behavioural responses of employees and government and the operational details of the pension privatization itself. Orszag and Stiglitz (1999) show that, depending on these partial effects, the overall effect on national saving could be positive, negative, or neutral. Isolating the pure effect of pension privatization is challenging, but empirical evidence from Chile strongly suggests that pension privatization did not increase national saving, and might have actually reduced it (Arenas de Mesa and Mesa-Lago, 2006). Overall, there has been no empirical evidence thus far to suggest that pension privatization had been successful in achieving any of the aforementioned side-effect benefits. The independent evaluation group of the World Bank (2006) concludes that side-effect benefits

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11 Stiglitz (1989) argues that indirect financing mechanisms through banks and insurance companies might be more appropriate for developing countries than direct financing mechanisms via capital markets.
“remain largely unrealized”. Therefore in this article we will focus on examining the performance of MPPFs in terms of realized rates of return.

Chile was the first country to privatize its pension system in 1981, under the Pinochet dictatorship. Inspired by the high real rates of return achieved by Chilean MPPFs during the first decade of operation, many countries in Latin America implemented similar pension privatization efforts in the nineties. The Chilean experience and the World Bank (1994) also influenced many countries in emerging Europe to implement similar pension reforms around the turn of the millennium. However, many features of the original Chilean approach were specific to the prevailing political and economic conditions in Chile in the early 1980s. In particular, it is hardly conceivable that an iconoclastic complete privatization of a mature public PAYG pension system could be undertaken in a democratic setting (Weil, 2008). Thus, most other developing countries opted for partial pension privatization in order to constrain the tremendous transition costs associated with complete pension system privatization.

4.1. Pension Privatization in Emerging Europe

Constraining pension privatization transition costs represented a major policy consideration in the formerly socialist countries in emerging Europe, since universal coverage of existing PAYG systems had implied significant half-a-century-long transition costs. Thus, emerging European countries opted for partial privatization that envisaged one quarter to one third of existing PAYG contributions being diverted to newly established fully funded private pension funds. MPPFs feature individual retirement accounts whose performance can be easily monitored by tracking the value of individual units over time. In this manner, we will be measuring gross rates of return net of annual management fees, but gross of any entry fees on contributions and any exit fees at retirement.
Table 2. Performance of MPPFs in emerging Europe, in %

<table>
<thead>
<tr>
<th>Country</th>
<th>Date of MPPF introduction</th>
<th>Since inception until end-2007</th>
<th>Since inception until end-2012</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Real return GDP Diff</td>
<td>Real return GDP Diff</td>
<td>Returns GDP</td>
</tr>
<tr>
<td>Hungary</td>
<td>Jan 1998</td>
<td>2.6 3.6 -1.0</td>
<td>1.4 2.4 -0.9</td>
<td>9.3 3.1</td>
</tr>
<tr>
<td>Poland</td>
<td>Jan 1999</td>
<td>8.2 4.1 4.1</td>
<td>5.4 3.9 1.5</td>
<td>9.2 1.8</td>
</tr>
<tr>
<td>Latvia</td>
<td>Jul 2001</td>
<td>-2.3 9.5 -11.8</td>
<td>-1.5 4.1 -5.7</td>
<td>8.8 8.2</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Apr 2002</td>
<td>4.3 6.3 -2.0</td>
<td>0.3 3.5 -3.3</td>
<td>9.5 3.9</td>
</tr>
<tr>
<td>Croatia</td>
<td>May 2002</td>
<td>4.5 4.8 -0.4</td>
<td>2.6 1.6 1.0</td>
<td>7.3 4.1</td>
</tr>
<tr>
<td>Estonia</td>
<td>Jul 2002</td>
<td>3.4 8.1 -4.7</td>
<td>-0.2 3.7 -3.9</td>
<td>11.6 7.2</td>
</tr>
<tr>
<td>Lithuania</td>
<td>Jun 2004</td>
<td>2.4 8.3 -5.9</td>
<td>-0.1 3.1 -3.1</td>
<td>12.2 7.4</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Apr 2005</td>
<td>1.1 8.7 -7.6</td>
<td>-1.2 4.3 -5.6</td>
<td>3.8 4.7</td>
</tr>
<tr>
<td>Macedonia</td>
<td>Feb 2006</td>
<td>2.7 5.6 -2.9</td>
<td>1.8 2.9 -1.1</td>
<td>8.2 2.7</td>
</tr>
<tr>
<td>Romania</td>
<td>May 2008</td>
<td>- - -</td>
<td>5.7 -0.2 5.9</td>
<td>4.5 5.1</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>3.0 6.6 -3.6</td>
<td>1.4 2.9 -1.5</td>
<td>8.4 4.8</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on returns data from official national MPPF authorities. Inflation (year-end) and GDP data is taken from the IMF World Economic Outlook database. Data for Hungary refers to the end of 2010 when the MPPF system was nationalized.

As mentioned earlier, the data in Table 2 represents geometric averaging. Using simple arithmetic averaging would overstate pension fund returns until the end of 2012 by 0.4 percentage points, while GDP growth would be overstated by only 0.1 percentage points. Furthermore, we can notice that the standard deviation of pension funds’ returns is significantly higher than the standard deviation of GDP growth, which confirms the theoretical results that market returns are inherently more volatile and more risky than PAYG returns.

We can notice in Table 2 that the initial performance of MPPFs in emerging Europe is disappointing. Although they were expected to yield high returns, tangibly higher than GDP growth, only MPPFs in Poland, Croatia, and Romania have been able to beat GDP growth thus far. Furthermore, the data for Romania

12 The overstatement effect in particularly noticeable in countries such as Estonia and Lithuania, where it is about 0.7 percentage points due to very volatile pension fund returns.
13 Data for Slovakia and Romania are exceptions. Due to strict investment regulations in 2008, Slovakian pension funds implemented extremely conservative investment policies with very low volatility and returns that were correspondingly low, even negative in real terms. MPPFs in Romania started operating only after the emergence of the global financial crisis and have not faced large variations in their returns.
cannot be considered statistically credible since MPPFs have been introduced only recently, after the emergence of the global financial crisis. Also, the performance of MPPFs in Croatia is somewhat overstated due to the politically motivated artificial inflation of pension fund returns in the inception year (Matković et al, 2009). Therefore only in the case of Poland can it be said that pension fund returns have definitely been higher than GDP growth. On the other hand, pension fund returns in Latvia, Estonia, Lithuania, and Slovakia have posted negative real returns, while real returns in Bulgaria were barely above zero. It should be stressed that poor MPPF performance cannot be blamed on the 2008 world financial crises, as pension funds were unable to outperform GDP growth even before this. In order to investigate structural problems with pension privatization in emerging Europe we investigate the structure of MPPFs’ portfolio assets.

### Table 3. MPPF asset portfolios, end-2007 data

<table>
<thead>
<tr>
<th>Country</th>
<th>MPPF assets, %GDP</th>
<th>Composition of asset portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Gov’t Bonds</td>
</tr>
<tr>
<td>Hungary</td>
<td>7.8</td>
<td>58.5%</td>
</tr>
<tr>
<td>Poland</td>
<td>11.9</td>
<td>59.9%</td>
</tr>
<tr>
<td>Latvia</td>
<td>1.6</td>
<td>33.4%</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>2.1</td>
<td>18.5%</td>
</tr>
<tr>
<td>Croatia</td>
<td>6.7</td>
<td>63.6%</td>
</tr>
<tr>
<td>Estonia</td>
<td>4.5</td>
<td>31.0%</td>
</tr>
<tr>
<td>Lithuania</td>
<td>1.7</td>
<td>29.6%</td>
</tr>
<tr>
<td>Slovakia</td>
<td>2.8</td>
<td>49.6%</td>
</tr>
<tr>
<td>Macedonia</td>
<td>0.9</td>
<td>59.9%</td>
</tr>
</tbody>
</table>

Source: Altiparmakov (2011).

Government bonds dominate the portfolios of mandatory private pension funds, amounting for more than 50% of total investment assets in Eastern European countries and over 30% in Baltic states.\(^\text{14}\) Government securities have been dominating pension funds’ portfolios in Poland since the inception of the MPPF system in 1999, with fixed-interest government bonds representing the major asset category and accounting for 51% of total pension fund assets. Thus it becomes obvious that the observed high returns of private pension funds in Poland are due to the very attractive interest rates offered by government securities. We can therefore conclude that contributors to Polish private pension funds have little to

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\(^\text{14}\) In Croatia it is required by law to have at least 50% of assets invested in government-issued securities. The same requirement was in force in Bulgaria until mid-2006.
be excited about, seeing as higher returns in their individual retirement accounts are being financed with their tax money.

In Section 2 we argued that using prefunding resources to invest in domestic government bonds essentially represents disguised PAYG financing, whereby taxpayers are interchanged with contributors and explicit public debt is interchanged with implicit public pension liabilities. The situation is even worse in the case of MPPFs investing in domestic government bonds, since net returns to contributors will be lower than the implicit PAYG rate of return due to the hefty fees charged by pension management companies (see below). Thus, from a national point of view, MPPF assets invested in domestic government bonds are first-order dominated by the PAYG pension component and should not be included in the optimal national pension portfolio. This is most obvious precisely in the case of Poland, where the public PAYG pension component is of notional defined-contribution (NDC) type.

One might argue that this is an inherent construction error in the pension privatization design in emerging Europe: MPPFs should had been forbidden from investing in domestic government bonds, not only to preclude the possibility of political manipulation of investment decisions, but also since this arrangement is financially inferior to pure PAYG financing. This exact line of reasoning lead Poland to significantly redesign its MPPF system in 2011, whereby 90% of new contributions flowing to MPPFs are invested in equities, in order to shift pension portfolios towards equity assets by 2020 (Bielecki, 2011). Due to limited investment possibilities in the domestic capital market, MPPFs’ contribution rate has been decreased from 7.3% to 2.3% of gross wages, with the remaining 5% being redirected back to the PAYG pension component. Future reform plans in Poland include transferring MPPF assets invested in government securities back to the state, so that explicit government debt is converted back into implicit pension debt and disguised PAYG financing is completely eliminated.

Despite all formerly socialist countries in emerging Europe having extremely undeveloped capital markets, international diversification of MPPF assets is very low, due to legal restrictions on investment abroad. For example, at the end of 2007 investment abroad accounted for 1.3% of MPPF assets in Poland, 4.3% in Croatia, 18.5% in Bulgaria, and 40% in Latvia. The reasoning behind the severe

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15 Significant fiscal deficits during the economic recession have also been one of the motives for redesigning the Polish pension system and devoting more resources to the public PAYG component.
limits on investment abroad is the desire to use most of MPPFs’ accumulated capital to boost domestic economic growth and increase employment, in order to catch up with developed economies in Western Europe.\textsuperscript{16} However, this home bias contributed to the disappointing performance of MPPFs that realized returns below the implicit PAYG rate of return.

### 4.2. Private Pension Funds’ Operating Fees

One more contributing factor to the disappointing performance of pension privatizations in emerging Europe are the hefty fees charged by pension management companies. In particular, the average (unweighted) contribution fee in 2008 amounted to 4.3\% of contributions and the average management fee amounted to about 1\% of assets. Furthermore, based on data from developed economies, one can expect the annuity purchase fee to be around 10\% of accumulated assets at retirement, if or when the withdrawal stage is appropriately implemented in emerging Europe.\textsuperscript{17}

Aggregating all operating fees in one number is somewhat challenging since they are charged on a different basis (contributions vs. assets under management) and different frequencies. Whitehouse (2001) proposes the use of charge ratio statistics that summarize the overall reduction in pension savings for a typical worker contributing during a 40-year horizon. Whitehouse shows that the contribution fee and annuity-purchase fee translate exactly one-to-one into charge ratio, while the management fee of 1\% translates to approximately a charge ratio of 20\% due to the compounding effect. This approximation is very robust with respect to plausible economic parameters. Thus, we will use the following approximation in the remainder of this section:

\[
\text{charge ratio} = \text{contribution fee} + \text{annuity purchase fee} + 20 \times \text{management fee}
\]

Calculating the average charge ratio for emerging European countries in this manner, we can conclude that management costs eat up about one third

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\textsuperscript{16} Baltic countries opted for more liberal limitations on investment abroad than Eastern European countries, due to concerns over extremely shallow domestic capital markets.

\textsuperscript{17} Annuity markets are basically non-existent in emerging Europe at the moment. Since efficient private provision of annuities, especially inflation-indexed ones, is an open issue even for developed economies, many authors are questioning whether emerging European countries are going to be able to properly regulate the withdrawal stage of MPPFs. Without a well-functioning annuities market, contributors will not be able to hedge the longevity risk, which beats the primary purpose of retirement saving (Diamond and Orszag, 2005).
of retirement assets, with only two thirds of assets going to pensioners. This extremely expensive operational structure should be sharply contrasted with PAYG operating costs, which are about 1% of retirement assets in all emerging European countries.

The problem of the high operating costs associated with MPPFs and individual retirement accounts has been extensively documented in the literature, including Beattie and McGillivray (1995), Orszag and Stiglitz (1999), and Barr (2000). Because of these high costs most developed OECD countries opted for prefunding via public pension reserve funds, exploiting economies of scale and lack of marketing expenses in order to minimize operating costs.\(^\text{18}\) Average PPRF operating fees in Section 2 equaled 0.2% of assets, implying an overall reduction in assets of about 4% during the 40-year retirement saving horizon - which is almost ten times less than MPPF operating costs in emerging Europe.

Despite significantly higher operating costs, emerging European countries opted for MPPFs instead of PPRFs, due to extensive empirical literature that shows a strong correlation between quality of public governance and PPRF performance (Iglesias and Palacios, 2000). Due to ongoing transition processes, public governance had not been perceived as very credible in most emerging European countries, which prompted pension prefunding via MPPFs. It should be noted that some countries, including Poland, Croatia, and Slovenia did use a part of initial proceeds from the privatization of state-owned companies to establish publicly funded pension system buffers. However, these capital accumulations were very modest, accounting for only a few percentage points of GDP. These one-time actions cannot be considered as serious pension prefunding efforts, nor a meaningful demographic buffer.

5. LESSONS FOR SERBIA

Although one decade of returns data from emerging Europe is not a long period in the context of the pension investment horizon, early empirical evidence strongly supports the conceptual concerns with the pension privatization approach that Beattie and McGillivray (1995) raised. While MPPFs had been

\(^{18}\) Among OECD countries, Australia opted for the MPPF approach. However, MPPFs in Australia were introduced on top of the modest flat-rate public pension system, thus avoiding tremendous transition costs. Nonetheless, operating costs of MPPFs in Australia are also high and averaged 1.25% of assets under management in 2011 (Australian Prudential Regulation Authority, 2013).
expected to yield tangibly higher returns than GDP growth in order to account for the transition cost burden, their performance was even lower than implicit PAYG rates of return. We have identified two major contributing factors to the disappointing performance of MPPFs: high operating costs and undeveloped domestic capital markets. Živković (2008) shows that the Serbian capital market is extremely shallow and undeveloped, implying that MPPFs in Serbia would face a disappointing return performance similar to that in other emerging European countries.

Of course, Serbia could allow MPPFs to invest freely in foreign assets in order to overcome the limitations of the domestic capital market. However, it would be ill advised to export domestic capital abroad under current Serbian macroeconomic conditions – a persistently high unemployment rate of about 20% and a low living standard, which stood at only 35% of the EU average in 2011, in GDP PPS per capita terms. Bajec et. al (2010) show that Serbia can hardly afford to export any domestic savings, since it has to significantly increase the available capital for financing domestic investment if it aspires to achieve vibrant growth rates (around 5% per year) during the next decade. Lastly, we note that allowing MPPFs to invest freely in foreign assets could solve the problem of the extremely undeveloped Serbian capital market, but would not help in solving the problem of high operating costs, which would eat up one third of retirement saving assets under existing MPPF arrangements in emerging Europe.

The only feasible approach to overcoming the significant operating costs associated with MPPFs is to opt for pension prefunding through PPRF. However, empirical evidence shows a strong correlation between the quality of public governance and the performance of PPRFs. Iglesias and Palacios (2000) measure the quality of public governance with a combined index comprising (i) efficiency of the judiciary system, (ii) the amount of ‘red tape’, and (iii) the corruption indicator. In this context it should be noticed that the Serbian judicial system has been deemed to be highly inefficient by most international authorities, including the European Commission. Furthermore, with respect to the amount of ‘red tape’, the World Bank Doing Business 2010 Report ranks Serbia 88th out of the 183 economies surveyed, with Greece and Bosnia-Herzegovina being the only European countries ranking lower than Serbia. The Transparency International 2010 Corruption Index ranks Serbia 78th among 178 countries in the world, with

19 The World Bank Doing Business sub-category on enforcing contracts ranks Serbia 94th out of 183 countries surveyed in 2010, with Bosnia, Montenegro, and Italy being the only European countries with lower rankings.
Albania and Bosnia-Herzegovina being the only European countries with lower ranking than Serbia. Evidently, the quality of public governance in Serbia is low, especially by European standards. Thus, if Serbia was to establish a PPRF, one could hardly expect that its performance could match the performance of PPRFs in developed countries with a high quality of public governance.

Several proposals to establish a public pension reserve fund in Serbia have been put forward in the literature, most notably by Mijatović (2008) and Kovačević and Bušatlija (2008). Despite disappointing empirical performance from similar developing countries with low quality of public governance, these authors express optimistic views with respect to the prospects of establishing a PPRF in Serbia. However, none of them provide economic analysis to substantiate their beliefs. Most importantly, none of them investigate whether pension system prefunding via a PPRF would be an economically efficient intergenerational transfer of wealth from current to future generations. To investigate this issue we take a ‘devil’s advocate’ position and analyze the economic performance of a hypothetical scenario, which assumes the ‘best of all worlds’ outcome with respect to the possibility of establishing a PPRF in Serbia.

In particular, we assume that Serbia establishes a PPRF and manages to minimize its administrative costs in line with best OECD experiences, despite the low quality of public governance in Serbia. Furthermore, we assume that prefunding assets are invested solely abroad to overcome the limitations of shallow domestic capital markets, despite macroeconomic limitations to exporting domestic savings. Finally, we assume that a potential PPRF in Serbia would be able to match the investment performance of PPRFs in developed OECD countries, despite the aforementioned poor quality of public governance. Even in this highly unrealistic scenario, real returns on Serbian prefunding assets would stand at around 4% at most, as we elaborated in Section 2. On the other hand, growth projections for Serbian GDP also stand in the 4% range in the medium term. Thus, even in this hypothetical ‘best of all worlds’ scenario, a potential PPRF in Serbia would not be able to beat the expected implicit PAYG rate of return, especially after accounting for higher volatility of PPRF returns with respect to PAYG returns. But, most

To counter this conclusion, one could of course argue the existence of downside risks with respect to achieving the anticipated growth rate in Serbia. However, if Serbia is not able to achieve vibrant economic growth in the coming period, in order to close the significant development gap with EU standards of living the pension system sustainability issue will be completely overshadowed by the sustainability concerns of the overall economic and social environment. After all, Barr (2000) highlights economic growth as a key precondition for a sustainable pension system, whether public or private, pay-as-you-go or funded.
importantly, PPRF returns would in any case be lower than the cost of Serbian public debt, which yields market rates of return of 5% in real terms. Thus, an intergenerational transfer in the form of a public pension reserve fund would be Pareto inefficient: it is dominated by the possibility of using the available assets to repay the outstanding public debt.  

5.1. Transition Costs

In debating possibilities for prefunding the Serbian pension system, especially among the general public, the issue of transition costs is most often neglected or understated. In order to build up a capital accumulation significant enough to represent a meaningful demographic buffer, current generations need to sacrifice a tangible amount of their welfare. In particular, a meaningful PPRF cannot be established just by using the proceeds from privatization of state-owned companies, as some countries in emerging Europe have done, since this approach would yield prefunding assets equal to only a few percentage points of GDP. From the experience of developed OECD countries, we have seen that a meaningful PPRF needs to accumulate assets of at least 30% of GDP, which requires a multi-decade prefunding commitment. The appropriate size of a potential Serbian PPRF would depend on the accompanying parametric PAYG changes. However, due to Serbia’s poor economic and demographic conditions, PPRF size relative to GDP can only be expected to be higher in Serbia than in developed OECD countries, not lower.

If Serbia were to decide to partially privatize the existing public pension system in a similar fashion to aforementioned emerging European countries, the transition costs would last about 40 years. If a portion of existing PAYG contributions equal to 5% of gross salaries were to be redirected to MPPFs, which can be considered a modest pension privatization arrangement in comparison to other countries, the average transition cost during the next four decades would equal 0.9% of GDP per year. In total, this would amount to about 35% of average GDP realized during the next 40 years (Stanic, Altiparmakov and Bajec, 2008). To put these numbers into perspective for an average citizen, pension system prefunding that would accumulate assets equal to 35% of Serbian GDP, either in the form of PPRFs or MPPFs, would produce transition costs of about 20 billion euros in 2013 (net present value). This would be sufficient to pay off the entire existing Serbian public debt, which currently stands at 19 billion Euros. Thus, if current generations were

21 Vittas et. al (2008) notice that pension prefunding in developed OECD countries has been driven by exactly opposite expectations - investment in global assets was expected to earn a higher rate of return than the cost of public debt.
in a position to make an economic sacrifice of this extent for the benefit of future generations, the most economically efficient and rational manner to make this intergenerational transfer would be to repay the outstanding public debt.

In summary, we can conclude that the effects of potential pension system prefunding, either in the form of PPRFs or MPPFs, would be reduced to an economically inefficient intergenerational wealth transfer from current to future generations.

6. CONCLUSION

The main conclusion from international experience of pension reform is that there is no panacea for the demographic aging phenomenon – each country has to identify and implement policies most suited to its own economic and social environment. Within the Serbian macroeconomic framework, realized returns on a potential funded pension component would likely be inferior to the implicit PAYG rates of return, due to undeveloped domestic capital markets, high expected growth in domestic productivity, high operating costs of private pension management companies, and poor quality of public governance. Existing financing problems in the Serbian pension system are not due to PAYG financing per se, but to the absence of appropriate parametric PAYG adjustments to demographic and economic changes throughout recent decades.

Enthusiasm for pension privatization and high expectations from mandatory private pension funds turned out to be mostly unfounded in emerging Europe. Due to the poor performance of MPPFs, Latvia, Lithuania, Poland, and Slovakia have significantly scaled down their mandatory private fully-funded pension components, while Hungary has completely nationalized MPPFs and switched back to the pure PAYG system. Similiarly, we have shown that the enthusiasm some authors have expressed for establishing a public pension reserve fund in Serbia is also unfounded. Potential PPRF would likely realize returns below the implicit PAYG rate of return, and it would most certainly realize returns below the market interest rate on outstanding public debt. Establishing a PPRF seems to be a feasible investment in some developed countries with high credit rating and high quality of public governance, but the situation is quite the opposite with developing countries such as Serbia, characterized with low credit ratings and low quality of public governance. Thus, we can conclude that pension system prefunding, either via mandatory private pension funds or a public pension reserve fund, would represent an economically inefficient intergenerational
transfer. If a wealth transfer from current to future generations were desirable from a macroeconomic or social perspective, a more efficient mechanism would be the repayment of public debt.

Economic analysis in this paper has shown that moving from the pure PAYG system to a partially funded pension system cannot yield superior economic performance, especially after taking into account multi-decade transition costs. Therefore we conclude that future efforts should be directed towards identifying parametric adjustments that would make the existing PAYG pension system socially acceptable and fiscally sustainable in the long run. Furthermore, voluntary retirement savings vehicles should be adequately integrated into mandatory aspects of the pension system and overall fiscal system.

REFERENCES


Australian Prudential Regulation Authority. (2013) Annual Superannuation Bulletin, Sydney, Australia


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World Bank. (1994). *Averting The Old Age Crisis*, Oxford University Press, USA


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