A macro-financial analysis of pension system reforms in emerging Europe: The performance of IRAs and policy lessons for Serbia

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Abstract The article explores the initial macro-financial performance of partial pension system "privatizations" — involving privately-managed individual retirement savings accounts (IRAs) — undertaken in many emerging European countries. Using empirical data for a period of close to a decade, the evidence shows that returns on privately-managed IRAs have been below the implicit rate of return of public pay-as-you-go (PAYG) systems. High operating costs and undeveloped capital markets are identified as major contributing factors to the failure of privately-managed IRAs to meet reform expectations. In light of empirical evidence, Serbia is advised to focus on parametric PAYG reforms and to avoid reforms that involve the partial "privatization" of the pension system.

Keywords social security reform, pension scheme, pay as you go system, defined contribution plan, privatization, Serbia

Introduction

Most regions of the world are experiencing population ageing as the result of lower fertility rates and longer life expectancies. The developed and emerging countries of Europe will experience significant ageing in the coming decades

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(European Commission, 2009).[1] The ageing process will result in a significantly different economic environment, which will require tangible changes to existing economic policies. One of the areas most directly affected by population ageing is the area of mandatory pension insurance.

Over the last couple of decades, significant efforts have been put into researching the most feasible reform approaches that would enable pension systems to successfully accommodate population ageing — a dynamic process that is projected to accelerate in the coming decades. Inspired by high observed returns on capital in most developed Western economies in the latter half of the twentieth century (the so called "equity-premium puzzle"), many economists have advocated for the partial privatization of public pension systems and a move from systems of pay-as-you-go (PAYG) financing to partially-funded systems. This argument is based on the understanding that the implicit rate of return of balanced PAYG systems is equal to the growth rate of covered wages, while the rate of return on fully-funded (FF) systems is equal to realized returns on portfolio assets. Thus, if one can credibly expect returns on capital to continue to outperform wage and GDP growth in the coming decades, it might be reasonable to consider a greater role for pre-funding in public pension systems.

The most influential arguments in favour of the partial pre-funding (involving privately-managed individual retirement savings accounts — IRAs) of public pension systems were put forward by the World Bank (1994), which recommended a ubiquitous three-pillar approach[2] to pension reform. Alternatively, it has been argued that there is no panacea to demographic ageing and that successful pension reforms have to analyze thoroughly and take into account the specific characteristics of each individual country (Barr and Diamond, 2009), especially when developing countries are concerned (Charlton and McKinnon, 2000).

Even if existing economic/financial conditions were to favour FF systems, deciding to move from a PAYG to a funded system is never a straightforward decision because of the inherent financial risks and transition costs this involves (Genakoplos, Mitchell and Zeldes, 2000). Transition costs arise because the PAYG pension systems that most countries already have in place have been operating for many decades. Thus, during the transition period — i.e. the period, possibly lasting

1. The term "emerging Europe" refers to former communist countries that are transitioning to market economies and striving to become, or are already, European Union Member States. These countries include: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Latvia, Lithuania, Hungary, the Former Yugoslav Republic of Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, and Slovenia.

2. According to World Bank terminology: Pillar 1 = mandatory public PAYG pension component; Pillar 2 = mandatory private FF component; Pillar 3 = voluntary private FF component. The design was later extended to include Pillar 0 = non-contributory basic pension providing minimum level of protection and Pillar 4 = informal intra-family or intergenerational financial and non-financial support to the elderly (Holzmann and Hinz, 2005).

several decades, that is necessary to finance a complete switch from an existing PAYG to a new FF system — there will be a requirement to finance two parallel pension systems: contributions to the PAYG system for existing (and soon to retire) pensioners; and FF system accumulations for future generations of pensioners.[3]

This article will investigate the financial feasibility of a partial "privatization" — involving the introduction of privately-managed IRAs — of the public pension system in Serbia. In this analysis, the transition cost associated with the partial switch from a public PAYG to a private FF pension system is treated as a national investment. We then apply standard investment finance principles in order to assess what return a rational investor might require from such an investment. Finally, we compare these theoretical performance expectations with early empirical evidence from emerging European countries that have partially privatized their pension systems in recent years.

The article is organized as follows: the next section develops a simple financial framework to assess the possible benefits for Serbian society of introducing privately-managed IRAs alongside the PAYG pension system. An analysis of the empirical evidence of the performance of FF pension components in emerging European countries is then presented. The article then discusses important risk factors that may influence the performance of IRAs and discusses the effects of the global financial crisis. Relevant conclusions and recommendations for the future design of the Serbian pension system are then drawn.

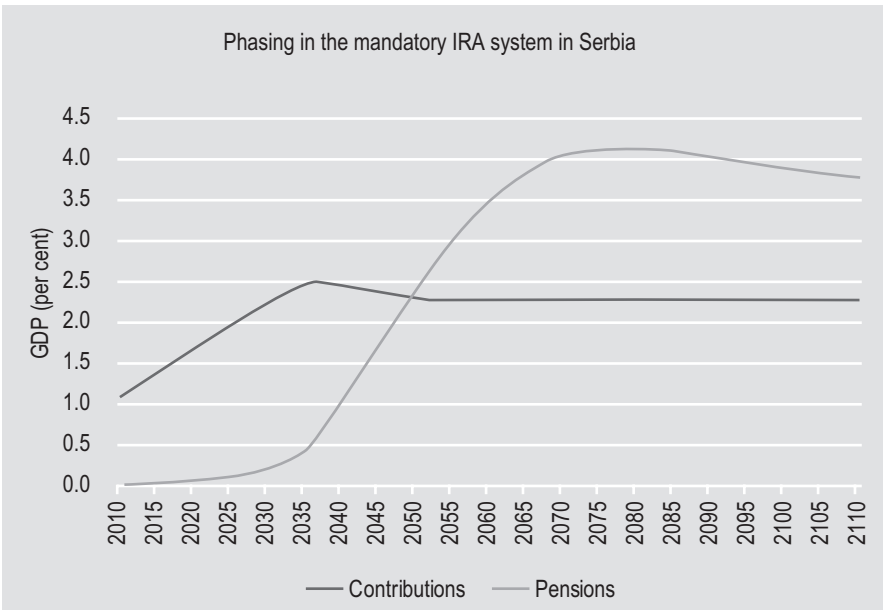
Macro-financial framework

In order to asses the financial feasibility of moving partially from a PAYG to a FF pension system, this analysis treats the entire nation as one "rational investor". The investor decides whether or not to undergo a business venture: i.e. to replace a part of the public PAYG pension system with a private FF system. The investment in this venture equates to the transition cost of financing two parallel pension systems for several decades. The venture pay-off is the (expected) financially more-efficient pension system in future decades.

Although the proposed scenario holds for any form of pre-funding, we will restrict our attention to one specific case — a FF pension component in the form of mandatory IRAs. Under this arrangement, all workers are required by law to contribute a portion of their earnings into privately-managed, defined contribution (DC) pension funds. This approach was initially implemented in Latin America during the 1980s and 1990s. With strong technical assistance support from the

3. The fiscal pressures of transition costs were part of the reason why Hungary effectively closed its mandatory IRA system in November 2010. As of February 2011, the majority of IRA assets had been transferred to state control.

Figure 1. *Expected IRA performance in Serbia, assumed returns = GDP growth + 1.5%*



Source: Author's calculations, based on official demographic projections for the 2002-2052 period. Real wage growth is assumed to equal productivity growth of 2.5 per cent per annum, while GDP growth is assumed to equal the sum of real wage growth rate and the growth rate of the working population. It is assumed that 7 per cent of gross salaries are devoted to the IRA contributions. The "hump" in contributions around 2040, and in pensions around 2080, is the result of the projected decline in the (working) population.

World Bank, many emerging Europe countries opted for this approach around the turn of the millennium.

Figure 1 presents the expected cash flows associated with a hypothetical, phased-introduction of a mandatory IRA system in Serbia in 2010, with the cutoff age set at 40 years.[4] We can observe that annual contributions to the IRA system rise over time as a growing share of the workforce is mandated to contribute. Pension payments from the IRA system are negligible in the first few decades (in the form of lump-sum payments for early termination, premature death and disability) and start becoming increasingly significant only after 25 years when the oldest generation contributing to the IRA starts to retire.

Pension payments increase steadily over time. After about 40 years of operation, pension payments under the IRA system equal annual contributions. This is the

4. All workers younger than age 40 at the time of inception are required to participate, while older workers are excluded. The age of 40 years would appear to be the average effective cutoff age in emerging Europe.

point when the transition cost of replacing (a part of) the PAYG system with the IRA system ceases. Thereafter, IRA pension payments are higher than contributions, and the "national investment" of switching from a PAYG to an IRA pension system starts to pay-off.

Estimates of the period of time during which transition costs are incurred can vary. For the case of Slovakia, Melichercik and Ungvarsky (2004) estimate transition costs to last about 40 years. Orban and Palotai (2005) estimated transition costs would last about 50 years in Hungary. However, Golias (2005) and Anusic, O'Keefe and Madzarevic-Sujster (2003) estimate transition costs to last only about 15 years for Slovakia and Croatia, respectively. These latter country studies arrive at very modest transition-cost estimates by defining transition costs as not pertaining to pension system privatization per se, but as involving all pension reform measures undertaken, including parametric PAYG reforms. In this manner, transition costs associated with the partial privatization of the pension system are reduced by the considerable PAYG savings that result from parametric reforms. This approach is not appropriate for assessing the feasibility of pension system privatization, as it hides the entire transition-cost burden the society will have to bear. For example, Orszag and Stiglitz (1999) stress the need for an independent assessment of the separate pension reform aspects. In our study, this implies not mixing the effects of partial pension system privatization with the effects of parametric PAYG reforms.

It should be noted that it will take 70 to 80 years of operation before the mandatory IRA system is fully mature and able to pay full (expected) benefits. Also, it should be stressed that the modelling assumption used in Figure 1 is that the realized IRA investment returns are, on average, 1.5 per cent higher than GDP growth throughout the entire projection period.[5] The shape and relative magnitudes of contributions and pensions depicted rely critically on the assumption of IRA returns being tangibly higher than GDP growth.

It is important to consider the criterion that a rational investor would take into account in deciding whether to undertake such an "IRA venture". Since we are considering an extremely long investment horizon, one approach could be to require that a feasible investment should recover its costs in a period of time equal to that spent while bearing the costs. Thus, if transition costs last for T years, IRA system efficiency gains (equal to pension payments minus contributions) from time T to time 2T should "cover" the transition cost borne from inception (time 0)

5. The assumption of IRA investment returns being 1.5 per cent greater than GDP growth refers to the average rate of return realized during the accumulation phase (before retirement) and during the liquidation phase (after retirement). In reality, the expected rate of return during the accumulation phase is tangibly higher than the annuity discount rate during the liquidation phase. The article refers to one "average" rate of return for clarity and simplicity of exposition (see also Stanic, Altiparmakov and Bajec, 2008).

to time T. As always in finance, we need to take into account the "time value of money" and work with discounted cash flows. An appropriate discount rate for this calculation is the GDP growth rate, since it captures the returns that society could have realized if it had opted for an alternative use of transition-cost resources.

Actuarial projections imply that an IRA rate of return on capital of 1.8 per cent above the GDP growth rate is the break-even point that satisfies the stated feasibility criterion for Serbia, assuming actuarially-fair valuation and the absence of administration fees. In this case, transition costs last for 40 years and the IRA system efficiency gains in the next 40 years exactly match costs borne (in net present value terms). Sensitivity analysis shows that this result is very robust and it holds for a wide range of plausible GDP growth assumptions.[6]

As mentioned, the "equity premium puzzle" (Mehra and Prescott, 1985) indicates significantly-higher market returns on capital compared to GDP or wage growth. This raises two questions. Is it possible to implement an IRA system to take advantage of these empirical observations? Can we expect financial conditions observed in the latter half of the twentieth century to persist throughout the twenty-first century in order that the partial switch from a PAYG system to a system of IRAs would be deemed a feasible venture? It is to answering these that we now turn.

Empirical evidence from emerging Europe

Emerging European countries have been operating public PAYG pensions systems for many decades, providing ostensibly universal coverage to all employees. In the early to mid 1990s, many emerging European countries followed the practice of several developed economies and introduced tax-preferred, voluntary private pension funds. Between 1998 and 2006, a number of emerging European countries implemented the World Bank three-pillar pension reform approach. The most prominent (and most controversial) aspect of this approach is the introduction of a mandatory privately-managed FF pension component in the form of IRAs. These emerging European countries chose to devote one-quarter to one-third of mandatory public pension contributions to privately managed DC pension funds (see Table 1). The objective was to try to diversify pension system exposure to different types of risks (demographic, market, political) by replacing a unitary PAYG system with a combination of a public PAYG and a privately-managed mandatory IRA component (World Bank, 1994; Fultz, 2002; Müller, 2003).

A number of countries have phased in IRA systems gradually, increasing the contribution rate for several years after inception (see Table 1). This was most

6. The break-even rate of return defined in this manner is sensitive to the prescribed cutoff age at inception. In particular, the break-even rate decreases for lower cutoff ages.

Table 1. *Mandatory individual retirement saving accounts in emerging Europe*

Country	Date of implementation	Percentage of gross salary to mandatory FF pillar	
		At inception	As of 2008
Hungary	Jan. 1998	6.0	8.0
Poland	Jan. 1999	7.3	7.3
Latvia	July 2001	2.0	8.0
Bulgaria	Apr. 2002	2.0	5.0
Croatia	May 2002	5.0	5.0
Estonia	July 2002	6.0	6.0
Lithuania	Jan. 2004	2.5	5.5
Slovakia	Apr. 2005	9.0	9.0
FYR Macedonia	Feb. 2006	7.4	7.4

Notes: IRAs are formally "not mandatory" in Lithuania, but participation in the private IRA system entails a corresponding reduction of public PAYG resources. In 2008, Romania also introduced an IRA at the initial contribution rate of 2 per cent that will gradually increase to 6 per cent by 2014.
Source: National supervisory authorities.

probably done in order to lessen political opposition to the IRA system, as a phased introduction may draw attention away from the challenging issue of financing several decades of associated transition costs, which these countries will have to bear.

IRA returns

Emerging European countries designed their IRA systems to include daily record keeping, and management companies are required to keep track of accumulated assets in the form of "unit values". By tracking unit values over time, it is possible to keep track of the pension funds' performance. In particular, it is possible to measure gross returns net of annual assets-under-management fees (but gross of contributions and any exit fees). Statistics on the movement of unit values over time have been collected from official supervisory authorities. Summary results are presented in Table 2,[7] while detailed annual data is presented in the Annex.

Data in Table 2 reveals the most surprising (and most troubling) discovery — with the exception of Poland, the IRAs in all emerging European countries realized returns below GDP growth. Real returns in many countries are significantly below

7. Table 2 presents a World Bank (2009) estimate of IRA returns in Hungary.

Table 2. *Performance of mandatory IRA systems in emerging Europe, in %*

Country	Since inception until the end of 2007		
	IRA system returns (%)	GDP growth (%)	diff. (%)
Hungary	2.6	4.0	–1.4
Poland	8.2	4.1	+3.9
Latvia	–2.4	9.1	–10.5
Bulgaria	4.3	5.9	–1.5
Croatia	4.5	4.8	–0.3
Estonia	3.4	8.2	–4.5
Lithuania	2.3	8.3	–5.5
Slovakia	1.1	8.7	–7.0
FYR Macedonia	2.7	4.9	–2.1

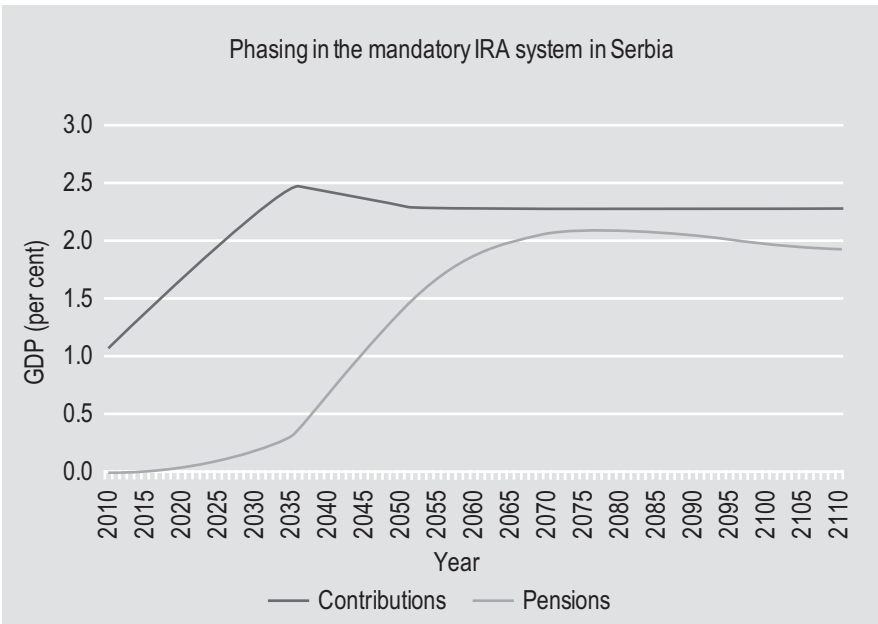
The difference between IRA system returns and GDP growth is calculated using the formula $(1 + a)/(a + b) - 1$. Where a = GDP growth; b = interest rate. Average growth rates over multi-year periods (based on annual growth rates), are based on geometric averaging.
Notes: GDP data is the yearly average, while IRA data is year-end. Average values were obtained by using geometric averaging. Inception year data has been proportionally weighted in cases where inception occurred in the middle of the year.
Source: GDP growth and inflation data have been compiled from the IMF World Economic Outlook database (http://www.imf.org/external/ns/cs.aspx?id=28), April 2010 edition. Nominal returns have been corrected for inflation by using year-end inflation data.

GDP growth, while Latvia even posted negative real returns. For countries that introduced mandatory IRAs rather recently, such as the Former Yugoslav Republic of Macedonia (implemented in 2006) and Slovakia (implemented in 2005), these observations are based on a couple of years of data. However, for most countries that introduced IRAs earlier, these observations are based on close to a decade of data.

It is very important to explain these findings comparing mandatory IRA returns to GDP growth. The implicit rate of return of a PAYG system equals the growth rate of covered wages in the economy or, alternatively put, GDP growth — as wages and GDP move together in the long run.[8] If the mandatory IRA system

8. The calculations in this article rely on GDP dynamics instead of covered wages for two reasons. The first one is the simplicity of exposition, since most economic research implies that covered wages present a fixed portion of GDP in the long-run. The second reason is practical: relevant comparative statistics on GDP growth are much more readily available than comparable statistics on covered wages.

Figure 2. *Empirical IRA performance, assumed returns = GDP growth − 0.5%*



Source: Author's calculations.

returns fall short of GDP growth, elementary financial theory suggests that a pension system based on PAYG financing is superior to a FF pension system (Samuelson, 1958; Aaron, 1966).

Thus, early empirical evidence from emerging Europe suggests that the introduction of a mandatory IRA system is proving to be an unfeasible national investment venture. Realized IRA returns are nowhere near the theoretical feasibility criterion derived for Serbia as presented earlier in this article. Even worse, realized returns by mandatory IRA systems in emerging Europe are proving to be inferior in practice to the existing PAYG systems they were designed to improve and partially replace. Figure 2 models the hypothetical introduction of a mandatory IRA system in Serbia, with assumed IRA returns 0.5 per cent below the GDP growth rate.

IRA investment portfolios

Poland would appear to be the major exception to the disappointing performance of mandatory IRA systems in emerging Europe. In order to explain Poland's apparent success, we need to look at the composition of the assets held by DC pension funds

Table 3. *IRA asset portfolios, end-2007 data*

Country	IRA assets, %GDP	Composition of asset portfolio			
		Gov't bonds	Equity	Bank deposits	Other
Hungary	7.8%	58.5%	32.8%	0.9%	7.9%
Poland	11.9%	59.9%	34.9%	2.9%	2.3%
Latvia	1.6%	33.4%	24.3%	42.1%	0.2%
Bulgaria	2.1%	18.5%	28.3%	16.2%	37.0%
Croatia	6.7%	63.6%	26.7%	2.2%	7.4%
Estonia	4.5%	31.0%	40.0%	8.0%	21.0%
Lithuania	1.7%	29.6%	39.3%	17.5%	13.6%
Slovakia	2.8%	49.6%	15.1%	30.5%	4.8%
Macedonia (FYR)	0.9%	59.9%	21.6%	18.5%	0.0%

* *Other assets* include corporate and municipal bonds, and also "investments abroad" for countries where these investments are treated separately (Bulgaria and Croatia).

managing the IRAs. Table 3 presents relevant information from the authorities responsible for the supervision of private pension funds.[9]

Government bonds dominate the portfolios of mandatory private pension funds, amounting to about 60 per cent of total investment assets in many emerging European countries. In Croatia, for instance, the law requires that at least 50 per cent of assets be invested in government issued (or guaranteed) securities. The same requirement was in force in Bulgaria until 2006. Baltic countries represent a notable exception when it comes to investment in government bonds.[10]

Government securities have dominated pension funds' portfolios in Poland since the inception of the mandatory IRA system in 1999. They accounted for 59.9 per cent of assets at the end of 2007. Fixed-interest government bonds represented the major asset category — accounting for 51 per cent of the total assets of pension funds. Thus, it may be assumed that the high observed returns of the Polish mandatory IRA system are due to the very attractive interest rates offered by government securities. We can conclude, therefore, that contributors in the Polish IRA system have little to be excited about, seeing as higher returns in their individual retirement accounts are being financed with their tax-money.

9. Pension funds in Estonia and Lithuania have been making significant indirect investments via investment funds. Data on investments in basic instruments in Table 3 represents the author's estimates based on official investment data for these two countries.

10. Baltic countries have the most liberal provisions regarding investments abroad. For example, at the end of 2007, 41 per cent of IRA assets in Latvia were invested abroad, compared to 18.5 per cent in Bulgaria or 4.3 per cent in Croatia.

Mandatory IRA systems have been introduced in order to diversify retirement risks normally associated with public PAYG pension systems — i.e. market risks associated with returns on labour versus returns on capital and political risks with respect to the public pension system's dependence on government finances. One can legitimately question, however, whether investing in government bonds represents a genuine investment with respect to both capitalizing the pension system and diversifying retirement risks. In the context of "mandatory" IRA systems in emerging Europe, investing in government bonds represents a very expensive form of PAYG financing — current employees pay taxes to the government from which the government finances not only interest payments to the IRA system but hefty fees to pension management companies.

Furthermore, heavy reliance on government bonds creates opportunities for non-market political influences to be exercised over the mandatory IRA system. Issuance of fixed-rate government bonds could be highly susceptible to political influences. Indeed, this exact scenario occurred at the inception of IRA system in Croatia in 2002. In a manner that was clearly politically motivated to justify the introduction of the IRA system, the government sold (already highly attractive) euro-denominated fixed-interest long-term bonds at a tangible discount. This resulted in an extraordinary high level of IRA returns in the inception year. If the inception-year returns are excluded, the yield in Croatia for the 2002-2007 period decreases significantly — from 4.5 per cent to only 3.1 per cent.

Of note, when confronted with the disappointing performance of the IRA system, the Croatian government tried to initiate a reassessment of the system in 2009. But, this initiative was stopped as a result of an orchestrated media campaign led by pension management companies. A similar turn of events occurred in Slovakia in 2007, when the government tried to initiate a reassessment of their mandatory IRA system. In response to pressure from pension management companies, Slovakia's government cancelled its initial plan to significantly downsize the mandatory IRA system, and instead had to confine its actions to making it possible for IRA affiliates to voluntarily exit the IRA system.

It would appear that the introduction of mandatory IRA systems in emerging Europe has been unsuccessful as a means to try to limit the influence of politics on the operation of national pension systems. On the contrary, they may have made the situation worse by introducing new political actors into the pension system arena — pension management companies. The next section will further explore the policy risks, and other types of risk, facing mixed PAYG-IRA systems.

Financial crisis and risk factors

The empirical observations presented above cover the period up to the end of 2007, and are unaffected by the 2008 global financial crisis. As shown in Table 4, the global

Table 4. *The melt down of emerging Europe IRA assets during the financial crisis, in %*

Country	IRA real returns			GDP growth		
	2008	2009	AVG	2008	2009	AVG
Hungary	–22.7	17.2	–4.8	0.6	–6.3	–2.9
Poland	–16.9	9.9	–4.4	5.0	1.7	3.3
Latvia	–19.8	13.9	–4.4	–4.6	–18.0	–11.5
Bulgaria	–25.5	6.2	–11.1	6.0	–5.0	0.3
Croatia	–14.9	6.7	–4.7	2.4	–5.8	–1.8
Estonia	–29.2	14.6	9.9	–3.6	–14.1	–9.0
Lithuania	–26.0	16.2	–7.3	2.8	–15.0	–6.5
Slovakia	–9.8	0.6	–4.7	6.2	–4.7	0.6
Macedonia	–13.4	13.7	–0.8	4.8	–0.7	2.0

Notes: AVG represents geometric average for 2008-2009.
Source: National supervisory authorities.

financial crisis in 2008 profoundly and adversely affected the IRA systems in emerging Europe. Asset values rebounded somewhat in 2009, but not enough to recover huge losses from 2008. During the global financial crisis, IRA assets not only experienced higher decline on average than GDP, but experienced more volatile movement than GDP.

The financial crisis brings us to another major aspect of pension reforms in emerging Europe — the inherent financial risks associated with IRA systems, DC pension funds and returns on capital. Financial economics explains that higher returns on capital, and equities in particular, are attributable to inherent investment risks. Equity returns are volatile and uncertain by their nature, so rational investors require a risk premium in order to invest in equities. A prominent feature of DC pension funds is that the investment risk is passed completely to contributors. Thus, even if DC private pension funds were capable of tangibly outperforming the GDP growth rate on average, this would not a priori imply their supremacy over defined benefit public PAYG systems, owing to the fact that DC pension funds expose contributors to significant investment risks.

How might the financial crisis influence the behaviour of workers who are saving for retirement through DC pension funds? In certain developed economies of North America and Western Europe, a significant proportion of workers are saving for retirement via semi-mandatory and voluntary tax-preferred DC pension funds. Nonetheless, except for granting tax privileges, governments in developed economies are not liable for the outcomes of such long-term saving instruments.

Workers freely decide about how much additional retirement savings they wish to make, and in what form. Furthermore, pension systems in these countries are structured in such a way that it is predominantly individuals with higher-than-average earnings who rely on voluntary IRA systems for retirement income. Thus, the risk and responsibility rests solely on individual citizens.

The prominent feature of pension reforms in emerging Europe is the "mandatory" nature of IRA systems. By legally requiring workers to contribute to private DC pension funds, instead of a public PAYG system, governments have made implicit guarantees for "positive" outcomes of switching from a PAYG to an IRA system.[11,12] This means that profoundly adverse events such as the financial crisis might prompt some sort of government reaction. This is especially the case since universal coverage within a mandatory IRA includes low-earning workers whose future income security might be impacted more severely by lower than expected returns from the IRA system. Whatever form government responses might take, these will effectively require devoting more national resources to the mandatory IRA system — making it even less feasible as a venture.

The model of financial analysis on expected cash flows presented earlier in this article completely ignores the issues of financial risk, uncertainty and volatility. The model implicitly assumed a role for a "risk-neutral" investor who cares only about expected outcomes and is indifferent to risk. In reality, however, investors are risk-averse and demand risk premiums for undertaking risky endeavours. Moreover, investors are exceptionally risk-averse when it comes to their retirement savings, not least because the 2008 global financial crisis represents just the latest in a series of burst equity bubbles that have occurred throughout the last century: 1929, 1973/74, 1989 and 2000.

Besides the inherent volatility risks associated with moving from a PAYG to an IRA system, there is another very important financial risk to take into account. This is the risk of a changing economic environment leading to a reversal of the financial conditions that existed in the latter half of the twentieth century when equity returns recorded extraordinarily high growth. That is, financial conditions in the mid-1990s were such that expected returns on capital were about 3 per cent higher than wage growth. In comparison, during the 1960s, expected returns on capital were in line with wage growth (Brown, 2007). It is very risky to assume that the economic and financial conditions that characterized the end of the twentieth century will endure throughout the twenty-first century. But it is on the basis of such an assumption that a switch from a PAYG to a mandatory IRA

11. In fact, government officials in many emerging European countries have been making explicit claims that moving from a PAYG to an IRA system will benefit citizens and future retirees.
12. Latvia explicitly allows contributors to the mixed PAYG-IRA system to switch back to the original PAYG scheme at the time of retirement, should this option turn out to be more advantageous (Müller, 2006).

system is often justified. That the phenomenon of high equity returns has been accorded the epithet of the equity premium "puzzle" indicates that economic theory is unable to explain clearly why high equity returns have been observed in many developed economies, especially in the United States. Economic theory is also unable to say whether the equity premium trend will be sustainable into the foreseeable future, or whether it might be expected to shrink in the coming decades (Siegel, 1999). Furthermore, there is abundant statistical evidence to suggest that demographic trends influence asset returns, so that demographic ageing could be expected to reduce the high rates of return that have been experienced during recent decades (Brooks, 2000; Abel, 2003; Davis and Li, 2003). Finally, a basic economic supply-demand principle suggests that implementing a nationwide IRA system would change the supply-demand conditions in equity markets and consequently could, in and of itself, cause a reversal of the high equity-returns trend.

Mention should also be given to the numerous operational risks associated with partial pension system privatization in practice. Capital markets have been functioning in developed economies for several centuries. In contrast, emerging European countries have only recently started transitioning from centrally-planned to market-oriented economies. Capital markets in these countries are underdeveloped and not comparable with those in developed economies. Equity markets in most emerging European countries feature only a few truly liquid stocks, bond markets are underdeveloped and corporate governance is often deficient. Most countries that have introduced a mandatory IRA system have only nascent annuity markets, making it difficult for contributors to hedge efficiently longevity risk at retirement.

It is uncertain when, or if, capital markets in emerging European countries will reach the level of development observed in developed economies. Furthermore, even among developed economies, huge differences exist when it comes to their reliance on capital markets — most notably the high reliance seen in the United States versus a relatively low reliance found in continental Europe. It should be mentioned that experts question the feasibility of establishing strong capital markets in developing economies. Taking into consideration information asymmetries and market imperfections, they argue that reliance on bank lending and indirect financing might be a more feasible approach for less-developed economies than (forced) reliance on capital markets (Stiglitz, 1989).

IRA system fees

Another operational risk regarding partial pension system privatization is the organizational structure of the mandatory private pension fund industry. Namely, evidence from most countries of high fees charged by pension management

Table 5. *Contribution and asset fee limits, 2007-2008 data*

Country	Contribution fee (%)	Annual asset fee (%)	Charge ratio (%)
Hungary	5.5	0.8	20.4
Poland	7.0	0.54	17.2
Latvia	No limit	No limit	—
Bulgaria	5.0	1.0	23.2
Croatia	0.8	1.2	23.0
Estonia	3.0	2.0	35.6
Lithuania	5.5	1.0	23.6
Slovakia	1.0	0.7	14.8
Macedonia (FYR)	6.9	0.6	18.2
Average	4.3	1.0	22.0

The charge ratio presents a single fee charged to the total accumulated savings balance at retirement that is financially equivalent to all other fees separately charged during the retirement saving process (Whitehouse, 2001). The charge ratio has been calculated by assuming 4 per cent annual nominal wage growth, 6 per cent annual nominal returns on capital and 40 years of regular contributions.
Notes: Tapia and Yermo (2008) estimate the average asset fee of 1.49 per cent for Latvia in 2006, which implies a charge ratio of 26.8 per cent.
Sources: National supervisory authorities; Social Protection Committee (2008).

companies suggests the inefficient organization of the retirement saving system and/or the oligopolistic behaviour of pension management companies. The organization of the mandatory IRA industry differs across emerging Europe. For example, Latvia, Estonia, Lithuania and Slovakia require pension management companies to offer multiple investment portfolios (conservative, balanced, growth) in order that that contributors may choose explicitly the level of investment risk exposure. Conversely, pension management companies in Poland, Bulgaria, Croatia, and the Former Yugoslav Republic of Macedonia offer single investment portfolios. The number of active pension management companies also varies — from two in the Former Yugoslav Republic of Macedonia to four in Croatia, six in Estonia and Slovakia, seven in Lithuania, eight in Bulgaria, nine in Latvia, and 15 in Poland. Despite significantly different industry arrangements, an unfavourable fee structure persists throughout emerging Europe. Table 5 presents legally-prescribed limits on contribution and asset management fees. In most circumstances, management companies charge the maximum, or close to the maximum, fees allowed by law.

It should be noted that Table 5 presents data on the two most common types of fees charged only. Regulations in some emerging European countries allow additional fees to be charged by management companies. For example, Estonia

allows a redemption fee of up to one per cent of accumulated assets. Furthermore, custody and trading expenses are most often prescribed to be borne by contributing workers, and not by management companies.

Last but not least, there is the issue of the annuity purchase fee charged by insurance companies when accumulated savings at retirement are to be transformed into a stream of regular pension payments. Thus far, no emerging European country has been able to regulate in a suitable manner the annuity purchase process at retirement. As a result of the difficulties faced by private markets in providing life annuities (especially those that are inflation indexed), it is questionable whether the annuity purchase process can be regulated at all, at least to a satisfactory level of operational efficiency. Poland, that has the first generation of pensioners within its IRA systems now reaching retirement, has postponed mandating the purchase of an annuity at retirement and is allowing retirees to opt for the phased withdrawal of accumulated savings. However, the phased withdrawal of savings does not protect retirees from longevity risk, which is the main objective of saving for retirement. As Diamond and Orszag (2005) point out: avoiding annuitization undercuts one of the basic principles of social security — to provide benefits that are protected against inflation and last as long as the beneficiary is alive.

It is difficult to predict the level of annuity purchase fees that might actually be charged, if and when this process gets suitably regulated. The Social Protection Committee (2008) suggests a reasonable annuity purchase fee to be in the 5 to 10 per cent range. Nonetheless, the Commission recognizes that annuity markets in many (emerging) European Union Member States are basically non-existent, which would imply an even higher fee for emerging European countries.

Taking all the above issues and fees into consideration, it can be concluded that the average charge ratio of 22 per cent presented in Table 5 would increase to above 30 per cent when all operating fees are taken into account. In another words, mandatory IRA systems in emerging Europe are structured so that about one-third of the total resources allocated to, or accumulated in, an individual account is lost to operating costs. This figure can be contrasted sharply with the costs of operating a standard PAYG system, which equate to about 1.0 per cent of contributions (or a 1.0 per cent charge ratio) for most of the emerging European countries.

It should be mentioned that many emerging European countries have stated their intention to lower fees in the coming years, as management companies recover their start-up costs. Some countries have already prescribed lower fees, although decreases were mostly marginal.

Summarizing the risk-return trade-off

Financial theory explains that higher expected returns are associated with higher investment risks. In efficient capital markets, investors only get compensated for

the non-diversifiable portion of investment risks. Thus, a well-diversified portfolio dominates a non-diversified portfolio in that it offers the same expected return with a lower level of risk (or equivalently, higher expected returns for the same level of risk). In fact, diversification of retirement provision has been one of the reasons behind partial pension system privatizations in emerging Europe. While pure PAYG systems rely on one source of income, namely labour, mixed PAYG-IRA systems rely on two retirement income sources: labour and capital. Regardless, we must not overlook that many common economic factors, including demographics, influence both returns on labour and returns on capital — which limits the extent of the benefits of diversification. Earlier in this article we discussed that undeveloped capital markets have prevented emerging European countries from realizing the benefits of diversification in the form of higher realized returns. How do newly-established mixed PAYG-IRA systems compare with pure PAYG systems in terms of risk?

Whitehouse, d'Addio and Reilly (2009) identify multiple sources of risk associated with national pension systems, including investment, purchasing-power and policy risks. As we have seen, partial pension system privatization introduces contributors to investment risk, which is not present in pure PAYG systems. Problems regarding the market provision of (indexed) annuities suggest that pure PAYG systems are better suited for dealing with the purchasing-power risk. Evidence of political interference by pension management companies in many emerging European countries suggests that mixed PAYG-IRA systems face more significant policy risks than the original, pure PAYG systems. In turn, policy risks as regards mandatory IRA systems were evident during the recent financial crisis, as the Estonian, Latvian, Lithuanian and Romanian governments decided to temporarily divert contributions from private IRAs to public PAYG systems in order to reduce budget deficits (World Bank, 2009).

Furthermore, within multi-pillared pension systems, IRAs are designed to address the need for savings to finance consumption in retirement only, while insurance aspects — to provide cover against the risks of premature death and disability — are only addressed within the PAYG component. Thus, partial pension system privatization amplifies these risks because the amount of contributions dedicated to covering these is reduced.[13] As a final observation, FF pension components are significantly more susceptible to extremely unfavourable economic conditions, which are more commonly encountered in emerging countries than in developed ones. For example, after the break up of the former Yugoslavia, Serbia experienced record-breaking hyper-inflation equal to 400 trillion percentage points

13. For example, Hungary had allowed disabled workers and beneficiaries of deceased workers from the mixed PAYG-IRA system to switch back to the original PAYG system, thereby allocating the total cost of morbidity and survivors' risk to the PAYG component (Augusztinovics et al., 2002).

in the period 1992-1993. This extreme inflation rate would have obliterated decades of saving if Serbia had relied on a FF pension system. Fortunately, Serbia was operating a PAYG system, the regular operation of which was restored in 1994 after inflation was brought back under control.

Overall, we can conclude that pure PAYG systems are less risky than mixed PAYG-IRA systems. The financial feasibility criterion derived in the first section of this article pertains to a risk-neutral setting. However, investors in the real world are risk-averse. Consequently, because of the significant investment and operational risks associated with the introduction of mandatory IRAs, any rational investor or rational government should require a significant risk premium when deciding to privatize the pension system.

Concluding remarks and policy lessons for Serbia

Replacing a part of the public PAYG pension system with a mandatory IRA system is an extremely risky venture. In the case of Serbia, such a venture would require the country to bear the fixed amount of transition costs for 40 years, while the possible venture pay-off might occur only about 80 years after implementing the reform. However, the venture pay-off is completely uncertain, and early empirical evidence from emerging Europe strongly indicates that similar ventures in other countries are proving to be unfeasible.

From the perspective of managing risk, mixed PAYG-IRA national pension systems are more risky compared to pure PAYG systems, because of inherent investment risk and significant operational risks. From the perspective of investment performance, realized IRA returns have been below the implicit PAYG rate of return. Overall, from the perspective of financial risk-return, the empirical performance of mixed PAYG-IRA systems in emerging Europe has been inferior to that of pure PAYG pension systems.

Although a decade is a short time in the context of pension system reform, disappointing experiences from emerging Europe provide strong empirical support to the conceptual concerns raised by Beattie and McGillivray (1995) regarding the introduction of mandatory IRAs and the partial privatization of pension systems. The disappointing early performance of mixed PAYG-IRA systems has led countries such as Croatia, Latvia and Slovakia to reconsider their initial reforms, while Hungary has decided to effectively nationalize its mandatory IRA system. Much will probably be said in future on the subject of why mandatory IRA systems in emerging Europe have failed to live up to reform expectations. This article has surveyed a number of major problem areas, including high operational costs and unrealistic expectations regarding the performance of capital markets in emerging countries. We will not dwell further on these important issues, but instead will seek

to summarize the most important lessons for future pension reform efforts in Serbia.

Although some features of a mandatory IRA system might, on a micro-level, appear appealing to the general public, empirical evidence indicates that combining an existing PAYG pension system with a mandatory IRA system has not improved the macro-financial sustainability of national pension systems in emerging Europe. This course of action has failed to insulate national pension systems from political interference, and might have even made them more susceptible to external policy risks.

Even if at some future point Serbia's economy and society could afford to bear the transition costs associated with a possible partial privatization of the pension system, it would be advisable to consider an alternative use of national resources. In particular, it would be wiser to use nationally-available resources to stimulate and support sustainable economic growth. Many pensions experts stress that broader issues of employment, productivity and economic growth are central to enabling the long-term sustainability of all pension systems — be they private or public, funded or PAYG financed (Barr, 2000).

In light of empirical evidence from emerging Europe, future pension reforms in Serbia are advised to follow the practices of most developed European and OECD countries, which have focused on parametric reforms of the public PAYG system (Martin and Whitehouse, 2008). As such, for Serbia, IRAs should serve only as a form of voluntary retirement provision to supplement public PAYG pension benefits.

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Annex

IRA returns and real GDP growth in emerging Europe

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average
Hungary	Nominal returns	15.7	17.1	7.9	8.0	7.4	3.4	16.3	13.0	4.5	7.0	–20.0	23.7	8.1
	Real returns	4.9	5.3	–2.0	1.1	2.5	–2.2	10.2	9.4	–1.9	–0.4	–22.7	17.2	1.3
	GDP growth	5.2	4.2	4.9	4.1	4.4	4.3	4.9	3.5	4.0	1.0	0.6	–6.3	2.8
Poland	Nominal returns		15.1	13.0	5.7	15.3	10.9	14.2	15.0	16.4	6.2	–14.2	13.7	9.8
	Real returns		4.8	4.2	2.0	14.4	9.1	9.4	14.2	14.8	2.1	–16.9	9.9	5.8
	GDP growth		4.5	4.3	1.2	1.4	3.9	5.3	3.6	6.2	6.8	5.0	1.7	4.0
Latvia	Nominal returns				4.9	6.3	0.3	3.8	6.7	2.8	2.5	–11.5	12.3	2.8
	Real returns				1.7	4.7	–3.1	–3.4	–0.3	–3.7	–10.1	–19.8	13.9	–2.9
	GDP growth				8.0	6.5	7.2	8.7	10.6	12.2	10.0	–4.6	–18.0	3.8
Bulgaria	Nominal returns					14.4	11.0	11.8	7.6	7.3	15.4	–20.1	7.9	6.0
	Real returns					10.2	5.1	7.5	0.2	1.2	3.4	–25.5	6.2	0.1
	GDP growth					4.5	5.0	6.6	6.2	6.3	6.2	6.0	–5.0	4.4
Croatia	Nominal returns					17.1	5.1	7.4	7.1	5.7	6.8	–12.5	8.7	4.9
	Real returns					15.0	3.3	4.5	3.3	3.6	0.9	–14.9	6.7	2.0
	GDP growth					5.4	5.0	4.3	4.2	4.7	5.5	2.4	–5.8	3.0
Estonia	Nominal returns					2.6	7.6	9.9	13.1	7.2	6.2	–24.3	12.7	3.7
	Real returns					0.0	6.5	4.7	9.2	2.0	–3.1	–29.2	14.6	–0.3
	GDP growth					7.9	7.6	7.2	9.4	10.0	7.2	–3.6	–14.1	3.4
Lithuania	Nominal returns							11.6	10.6	5.3	3.8	–19.7	17.6	3.5
	Real returns							8.5	7.4	0.8	–4.1	–26.0	16.2	–1.3
	GDP growth							7.4	7.8	7.8	9.8	2.8	–15.0	2.7
Slovakia	Nominal returns								4.5	4.6	3.7	–6.7	0.6	1.1
	Real returns								0.8	1.1	1.4	–9.8	0.6	–1.4
	GDP growth								6.7	8.5	10.6	6.2	–4.7	5.2
Macedonia (FYR)	Nominal returns									6.7	8.7	–9.9	11.8	3.9
	Real returns									3.5	2.0	–13.4	13.7	0.9
	GDP growth									3.9	5.9	4.8	–0.7	3.4

Notes: Data on inflation and real GDP growth are taken from the *World Economic Outlook* (IMF, 2010). Data on nominal IRA returns presents gross returns net of annual asset fees (but gross of contributions and any exit fees). Real IRA returns have been obtained by correcting year-end nominal returns for year-end inflation. In cases where IRA systems have been operating for less than 12 months in the inception year, relevant data have been annualized. Average values were obtained by using geometric averaging. In deriving average values, inception-year data has been proportionally weighted in cases where inception occurred in the middle of the year.
Data on nominal year-end IRA returns have been obtained from official supervisory institution websites: http://www.pszaf.hu (Hungary, 2008-2009), http://www.knf.gov.pl (Poland), http://www.fktk.lv (Latvia), http://www.fsc.bg (Bulgaria), http://www.hanfa.hr (Croatia), http://www.pensionikeskus.ee (Estonia), http://www.vpk.lt (Lithuania), http://www.adss.sk (Slovakia) and http://www.mapas.gov.mk (Former Yugoslav Republic of Macedonia).
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