

Bosnia and Herzegovina Pension System Note

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Human Development Sector Unit
Europe and Central Asia Region

BOSNIA AND HERZEGOVINA: PENSION SYSTEM NOTE

ACRONYMS AND ABBREVIATIONS

BH	Bosnia and Herzegovina
ECA	Europe and Central Asia
FBiH	Federation of Bosnia and Herzegovina
KM	Convertible Mark
OECD	Organization for Economic Cooperation and Development
PAYG	Pay As You Go
PROST	Pension Reform Options Simulation Toolkit
RS	Republika Srpska

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EXECUTIVE SUMMARY

The BH pension system currently consists of two pension funds, each functioning in one of the two entities making up Bosnia and Herzegovina; the Federation and Republika Srpska. Both pension systems have already undertaken substantial reforms supported by the World Bank. However, critical problems still exist in both systems and will only worsen with time.

The Federation pension system will pay lower and lower benefits over time, as the revenue constraint under which it operates becomes more and more binding, resulting eventually in benefits paid which are lower, relative to average wage, than the contribution rates which are expected to be paid over one's full working career. Republika Srpska, on the other hand, has opted to finance a number of pension expenditure items through budgetary support to the pension fund and has chosen to loosen the impact of the revenue constraint on expenditures. As a result, significant budgetary support is required in the RS pension fund and will only increase with time.

Contribution rates, at 24% of gross wage and 24% of net wage in the Federation and Republika Srpska respectively, are relatively high by OECD standards, and the OECD countries are much older in general than Bosnia and Herzegovina. Benefit rates are also a little more generous than in OECD countries with individuals accruing more than 2 percentage points of net wage per year of contribution for the first 20 years. On the other hand, retirement age has been officially raised to 65 in both entities, although a large percentage of new retirees continue to retire much earlier. Pensions are already based on full career earnings in Republika Srpska and rapidly moving in that direction in the Federation, which is international best practice.

In addition, a number of design features in both systems provide incentives for short contribution careers, increasing the prevalence of informal labor markets. First, accrual rates in both systems are significantly higher for the first 20 years than for the second 20 years. After 40 years of contributions, no increases in benefits are permitted. Individuals thus are encouraged to contribute 20 years just to gain eligibility and then to move to the informal sector, or more commonly, to spend the first 20-25 years of their career in the informal sector and then transfer to the formal sector just before retiring the qualify for a pension.

Similarly, eligibility standards for disability payments include inability to perform one's last job. Internationally, disability is often defined as inability to perform any job. Furthermore, the payments paid by the disability system are more generous than those provided by the old age system. If an individual has contributed for the 19 years prior to retirement and can claim a disability before reaching retirement age, the individual is eligible for a higher pension than if the person contributes an additional year and qualifies under the old age pension.

Pension system parameters across the two systems are also similar, but not identical leading to further fragmentation of the labor market in the country. The pension note

provides an option for parametric reform, as an illustration of what is possible, harmonizing the parameters, removing the disincentives built into the systems, and moving the few parameters not now aligned with international norms into conformity with international standards. The recommended parametric changes include the following: (1) moving both systems to the same contribution rate of 24%, presented as a percentage of net wage which involves a reduction for the Federation system, (2) removing the option for women to retire at 60 in Republika Srpska, (3) lowering the annual accrual rate to 1.5% for all years from the current higher level for the first 20 years, but removing the limits which penalize those who might try to contribute more than 40 years, (4) a move from the current coefficient system to a systematic indexation of pensions to inflation, and (5) constraints on new disability and survivor pensions which will reduce the numbers sharply by 50% in 20 years. However, while leading to improvements in the fiscal situation in the RS pension fund and in the level of benefits paid in the Federation relative to the new lower level of contributions coming from the harmonization, the pension funds will still experience significant deficits in the longer term.

Furthermore, the increased informality of the labor markets in the past 15 years will give rise to a larger percentage of elderly in the future who have spent insufficient time in the formal labor markets to collect any pension. At some point it may become socially unacceptable for almost half of the elderly to receive nothing from the Government, while the Government continues to provide subsidies to the pension funds to cover their deficits, enabling payments to the relatively better off elderly. From a longer run perspective, the Governments may want to further downsize the publicly managed contributory pension sector bringing it into fiscal balance and provide from Government resources a social pension for all elderly in Bosnia and Herzegovina. Measures to achieve this balance include reducing the accrual rate in the systems further, and raising the long run retirement age. In the particular example used, the total amount of Government resources required to provide a minimal social pension would be equivalent to those required to cover the deficits of even the reformed contributory schemes and all elderly BH citizens would receive some support from the Government. If people want additional pension, they can always choose to save additional money through a voluntary system.

Proposals to move toward a funded system, to be included as an integral part of the pension system (second pillar) or as a voluntary supplement to the existing scheme (third pillar), need to be carefully evaluated. Successful implementation of a second pillar would involve the Government's covering the pension expenditures of the current pensioners and the soon to be pensioners from its own resources while all or some of the contributions from current workers are diverted to individual private pension fund accounts. Privatization proceeds are a source of potential resources to cover this transition, but they typically are available for a 2-3 year period while the transition period during which the government has to cover pensioners and pension rights typically lasts 20-40 years, depending on how the reform is designed. A second area for evaluation is the state of the financial markets. Are there sufficient financial market instruments, which offer reasonable returns without undue risk, in which to invest pension contributions? Is the regulation and supervision of the financial markets such that unsophisticated investors, such as the typical worker, can safely invest their lifetime savings and expect to receive a reasonable pension in 30 or 40 years'

time? Is there a stable enough macroeconomic framework that the financial market can even provide long term instruments? Without these financial market and macroeconomic preconditions, the funded pension system will not provide adequate pensions, resulting in implicit liabilities for a government unwilling to allow its elderly to starve, but without access to the resources provided by worker contributions to a public pension system.

At the same time, the public pension system will clearly have to pay less generous benefits in the future. Reforms which enhance the financial market structure will allow individuals to save additional resources for themselves to augment the reduced pensions that the public system will pay, if they so desire. These reforms need to involve improvements in the full range of financial market instruments, including housing finance, since ownership of housing relieves the elderly of a major expense. The marketing of unregulated pension products while the financial market structure is evolving can often result in substantial losses to unwitting savers, making it more difficult to rely on products like these for some portion of retirement savings in the future. The Government is strongly encouraged to create the legal and institutional framework which can insure development of a healthy non-bank financial sector, including a pension product market, rather than allowing unregulated schemes to proliferate.

The public pension system will continue to require substantial resources from the Government in the medium term under whatever configuration of structural reform is eventually enacted. The Government is urged to focus its energies on reforms to this system, which can then create the fiscal room for a more substantive future reform, while it also creates the legal and institutional structure under which the financial markets can develop.

I. INTRODUCTION

1. The BH pension system currently consists of two pension funds, each functioning in one of the two entities making up Bosnia and Herzegovina, the Federation (FBiH) and Republika Srpska (RS). Both pension systems have already undertaken substantial reforms supported by the World Bank. However, critical problems still exist in both systems and will only worsen with time.

2. This note provides an evaluation of the current system and provides some possible reform options. The note is organized as follows: Section 2 contains a brief overview of the historical development of the pension systems, Section 3 contains a brief overview of the current demographics and financial status of the pension funds, Section 4 provides a detailed review of the pension system design parameters in each system, providing international comparisons, Section 5 provides projections of the financial and social consequences of today's parameters, Section 6 provides some reform options which harmonize parameters across the two entities and remove the most obvious disincentives in the current systems, Section 7 provides a longer run view on options for dealing with declining pension coverage among the elderly, and Section 8 concludes.

II. HISTORICAL DEVELOPMENT OF THE PENSION SYSTEMS OF BOSNIA AND HERZEGOVINA

3. The current BH pension system is derived in some form from the original pre-war Yugoslavian pension system. The original system had common characteristics throughout the former Yugoslavia, but was administered by the individual entities which comprised Yugoslavia. The administrative unit for Bosnia and Herzegovina was headquartered in Sarajevo. This unit's historical records are now kept by an enterprise known as ERC-ZIPPO and contain all the historic pre-war earnings histories of individuals who lived and worked in the territory of Bosnia and Herzegovina.

4. During the war, each of the ethnic entities created its own pension fund, the Bosniaks (Bosnian Muslims) using the pension fund based in Sarajevo which was inherited from the old Yugoslav pension system, the Croats creating a new pension fund headquartered in Mostar, and the Serbs creating their own pension fund in Bjelina. Only the Bosniak pension fund had access to the prewar wage histories and continued to function under the old parameters. The Croat pension fund provided merely a flat pension payment to all qualified pensioners; the Serb pension fund tried using educational attainment as a rough proxy for former earnings, with pension levels differentiated into five categories. In the case of the Croat fund and the Serb fund, the pension levels were adjusted somewhat to the finances payable by the pension fund. By contrast, the Bosniak fund, burdened with the legacy of the more generous Yugoslavian system began to run sizable arrears, which by mid-1998 had accumulated to approximately 5% of GDP.

5. Post-war, all pension funds had access to the pre-war Sarajevo data, although access to this data was not free, and all three pension funds reverted to pensions based on actual wage histories. There was a fear that reverting to the pre-war wage histories would create similar pension arrears in the other two pension funds as existed in the Sarajevo fund, which would pose a strong threat to fiscal and macroeconomic stability. While the pre-war ratio of pensioners to contributors in Bosnia and Herzegovina was about 0.3, it had doubled by the end of the war and hovered around 0.7 in the Federation and had risen even higher to 1.1 in RS in 2000. It has now fallen somewhat in the Federation to 0.63 and more markedly in RS to 0.59, as the data for 2003 in both funds show. Nevertheless, since PAYG pension funds derive their revenues from contributors and use these revenues to pay beneficiaries, all the pension funds suffered from a loss of contribution revenue coupled with an increase in beneficiary expenditures, leading to a potential rise in arrears.

6. To avoid the huge rise in potential arrears from which the economies could not recover, the Office of the High Representative in 1998 passed a ruling limiting the pension payments due to the amount collected, which prohibited the emergence of arrears. This ruling has subsequently been ratified by law in both the Federation and RS. However, as discussed in the next section, the implementation of the policy in the two entities is quite different.

7. In the meantime, both the Federation and RS passed new pension laws with parameters different from those under the old Yugoslav system. For a period of time, the two pension funds in the Federation administered the same parameters, but separately. Eventually, in 2002, the two pension funds in the Federation merged into one, although the databases are still kept separately and use separate IT systems.

8. The war created a number of other problems. Large migrations of people took place, not just within Bosnia and Herzegovina, but from and to the other components of the former Yugoslavia. Pension histories for workers are kept by the pension fund where the individual worked. Based on treaties among the former Yugoslav entities, the pension fund with the relevant work history records is the one which pays the pensions. Thus, there are BH citizens today receiving pensions from Croatia and Serbia as well as other former Yugoslav entities, and the BH pension funds pay pensions to individuals not residing in Bosnia and Herzegovina. As the war ended, these treaties were not in place, and whether one could collect a pension from another territory depended in part on one's ethnic background and in part on one's creativity in setting up transfer arrangements. In the short run, in some cases, the pension fund in the territory in which the individual was residing took on the obligations of another pension fund at least in part in order to provide its inhabitants with some subsistence. As a result, some people are receiving pensions from multiple sources even now. But even when most of these issues have been resolved, problems remain with respect to health insurance. Typically in the former Yugoslav countries, health insurance for retirees is paid by the pension fund on behalf of the retirees. While the pensions are generally being paid to individuals, countries and entities are not paying health contributions to health insurance funds other than their own. Contribution rates for health also differ across these various countries and entities, making it harder to reconcile these issues.

9. A second set of problems created by the war relates to disability and war veterans. Both entities provide disability benefits through the social insurance systems, more generous than to regular workers, as well as providing some separate funds for war veterans, particularly disabled war veterans. In contrast to some of the former Yugoslav countries which ask war veterans to first collect what is due from social insurance and then based on means testing provide additional benefits, in Bosnia and Herzegovina no means testing is done with respect to veterans' benefits. As a result, there may be people who are collecting benefits both from social insurance and through veterans' programs. From a fairness point of view, this is probably correct in that the veterans' programs are designed to help all those who served during the war which these individuals did, and the social insurance programs are designed to provide pensions to those who contributed which these individuals did as well. From a social protection point of view when a state has limited resources, overprotecting some individuals and being forced to leave others with no protection may not be the wisest policy.

10. A third problem exacerbated by the war is that the number of disabled is clearly higher than would be the case in the absence of war. The increase in the number of disabled raises pension expenditures while reducing the potential contribution revenue.

11. Finally, work histories from the war period are incomplete, and both pension funds have had to establish rules for attributable wages when wage histories are unavailable. In addition, there are firms where workers are working, but the firms are no longer remitting payments; there are others which have either shut down or are operating with reduced work forces, but retain their full work forces on the payroll. There are questions of whether the pension funds will one day be forced to recognize the rights of these workers who have been retained on payroll without being paid and without contributions being paid as part of the war upheaval. Many of the transition economies face similar problems, but these are compounded in Bosnia and Herzegovina by the impact of the war.

III. CURRENT PENSION SYSTEM DEMOGRAPHICS AND FINANCIAL SYSTEM OUTCOMES

12. Table 1 summarizes the demographics of the current BH pension systems and the financial outcomes of the two systems.

Table 1: Statistics of the Bosnia and Herzegovina Pension System

Indicators	Federation	Republika Srpska
Number of Contributors (total)	465,998	294,044
<i>Men</i>	290,405	173,740
<i>Women</i>	175,593	120,304
Number of Beneficiaries	293,348	173,784
Old Age	119,263	79,606
<i>Men</i>	87,095	56,930
<i>Women</i>	32,168	22,676
Disability	65,128	32,313
<i>Men</i>	44,589	22,317
<i>Women</i>	20,539	9,996
Survivors	108,957	61,865
<i>Men</i>	8,845	
<i>Women</i>	100,112	61,865
System Dependency Ratio	62.95%	59.10%
Old Age Population Dependency Ratio	15.5%	15.5%
Expenditures (total in mil KM)	679	310
Old age Pensions (women)	95.0	43.4
Old age Pensions (men)	264.8	127.0
Survivor Pensions	203.7	86.7
Disability Pensions (women)	33.9	15.5
Disability Pensions (men)	81.4	37.2
Average Covered Wage (thousand KM)	6,532	3,450
Revenues (in mil KM)	731	243
Surplus or Deficit	52	-66
Coverage (contributors/pop 15-64 of BH)	15.6%	9.9%
Pensioner coverage (pensioners/pop65+ of BH)	41.6%	25.2%
Pensions expenditure as % of GDP	5.3%	2.4%
Surplus/Deficit as % of GDP	0.4%	-0.5%

13. One of the first things to note in the table is the marked discrepancy between the population dependency rate and the system dependency rates, where the population dependency rate is the number of people aged 65 and above compared to the number of people of working age, typically considered ages 15-64.¹ While the ratio of pension system

¹ All population numbers in Bosnia and Herzegovina need to be treated as approximate. No census has been taken since before the war, so no one really knows what the population numbers look like, much less the age specific population structure.

dependency rate is usually twice the population dependency rate in OECD countries, it is approximately four times the population dependency rate in Bosnia and Herzegovina. The typical system dependency rate is three times the population dependency rate in ECA countries where individuals typically retire earlier than age 65, where there are relatively high levels of moderately young disability pensioners and where the growth of informalization has resulted in a drop in the number of contributors. Both BH systems end up with even higher system dependency rates, largely due to the large number of survivor pensions. Note that in both entities, the number of survivor pensions is close to the same as the number of old age pensions, 91% in the case of the Federation and 77.5% in RS. By contrast, in countries like the Slovak Republic which are also transition countries, but without the war experience, the number of survivor pensioners is only 38% of the number of old age pensioners. Similarly, in Albania which is poorer, survivor pensioners are only 15% of old age pensioners. Serbia, which shares the war legacy, although with less of the fighting on its own territory, has 57% as many survivor pensioners as old age pensioners.

14. Contributor coverage rates are extremely low, with only 25.5% of the population aged 15-64 contributing to the pension system. Since the denominator is the entire population of BH aged 15-64, the 25.5% comes from adding the contributor coverage ratios in the two entities. By contrast, contributors in the employed pension fund alone in Serbia account for 30% of the population aged 15-64 and additional contributors come from the separate farmers' and self-employed funds. In Albania, 39% of the working age population contributes, and in Slovak Republic, 57% of the working age population contributes. Given the low contributor coverage rates, the system dependency rates look surprisingly low. However, the pensioner coverage rates are also moderately low, with only 2/3 of the individuals 65 and older actually collecting pensions from either entity's pension fund, compared to many ECA countries where virtually all the elderly are collecting some form of pension and sometimes more than one.

15. The pension funds are in relative balance as a result of the revenue-constrained spending limits. In the case of RS, the revenue-constraints are not applied as strictly as in the Federation with a number of items, such as pensions for the military, merit pensions, and minimum pensions financed out of the budget.

IV. PENSION SYSTEM PARAMETERS

16. Table 2 below summarizes the main pension system parameters in the two entities. The parameters are similar, but not identical, having been derived from separate legislative processes. However, in the longer run, promoting labor mobility between the two entities may require some harmonization of policies between them.

Table 2: Pension System Parameters for Bosnia and Herzegovina

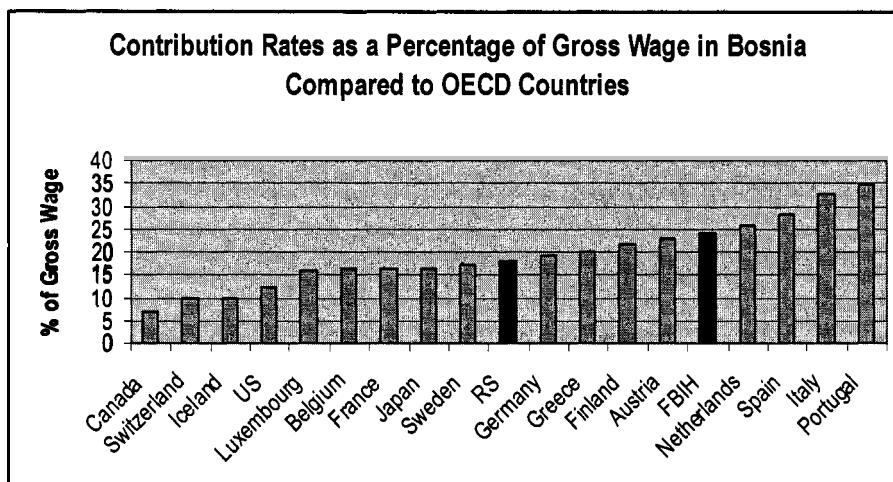
Pension Parameters	Federation	RS
Retirement Age	65 M/F with 20 years of contribution as of 2003; Any age with 40 years of contribution Until 2008, could retire at 60M/55 F with 35M,30 F years of contribution, but subject to penalty of 1%M/0.5%F for each year before the age of 65;	65 M/60F with 20 years of contribution as of 2006; ² Any age with 40M/35F years of contribution
Accrual rate	2.25% per year for first 20 years; 1.5% per year for next 20 years; 0 beyond 40 years	2.25% for first 20 years; 1.5% for next 20 years; 0 beyond 40 years
Pensionable base	Average net wages earned during the previous 40 years (increasing from 18 year average to 40 years between 2006 and 2015), revalued with historical average wage growth	Net wages earned since 1970 , excluding 1992 and 1993, revalued with historical average wage growth
Indexation post-retirement	To average wage growth by law, but not implemented as such, subject to revenue constraint	To average wage growth but subject to revenue constraint
Eligibility for disability pension	Contributed for 1/3 of working life from age 20 to age of disability; No requirement if work injury; Defined as inability to work at previous job	Contributed for 1/3 of working life from age 20 to age of disability; No requirement if work injury; Defined as inability to work at previous job
Level of Disability Pension	50% for up to 20 years' contributions; 1.67% more for additional years with a maximum of 75% reached at 35 years; Automatic maximum irrespective of years if work injury	50 for up to 20 years; 1.25% for subsequent years with maximum of 75%; Automatic maximum irrespective of years if work injury
Eligibility for survivor's pension	Age 45, incapacity, or caring for a child in case of widow; Age 60, incapacity, or caring for a child in case of widower; Children aged 15 or under and until age 25	Age 45, incapacity, or caring for child in case of widow; Age 55, incapacity, or caring for a child in case of widower; Children aged 15 or younger and

² Although the law indicates that retirement provisions are equal for men and women, women have the option of retiring at age 60 and at any age with 35 years of contributions, and most do. The benefit formula is the same as for men so that women who retire earlier receive lower benefits on the basis of having accumulated fewer years of service, but there is no actuarial reduction for the earlier retirement provision.

	if students or lifetime if incapacitated	until 26 if full time students or lifetime if incapacitated
Level of survivor's pension	70% of contributor's entitlement if 1 person; 80% to be divided by 2; 90% to be divided by 3; and 100% to be divided if 4 or more	70% of contributor's entitlement if 1 person; 80% to be divided by 2; 90% to be divided by 3; and 100% to be divided if 4 or more
Contribution Rates	24% of gross salary	24% of net wage

17. *Contribution Rates.* Starting at the bottom of the table, contribution rates are set at the same level, but are measured as percentage of gross salary in the case of the Federation and as percentage of net salary in the case of RS. Typically, countries express contribution rates as a percentage of gross wage. By making the assumption that gross wage is about one-third higher than net wage, the net wage based contribution rates can be converted to gross wage based contribution rates to compare with contribution rates in other countries. Figure 1 shows the comparison with OECD countries, suggesting that while the contribution rates in the BH systems are not higher than all high income countries, they are relatively high, given that the OECD average contribution rate is 19% for pensions, just barely above RS's 18% gross wage adjusted contribution rate and well below FBIH's 24% contribution rate. Furthermore, it should be noted that while Bosnia and Herzegovina has approximately 14% of population above the age of 65, typical OECD countries average 16% of population above the age of 65, requiring higher contributions from the working age population to support the larger number of elderly.

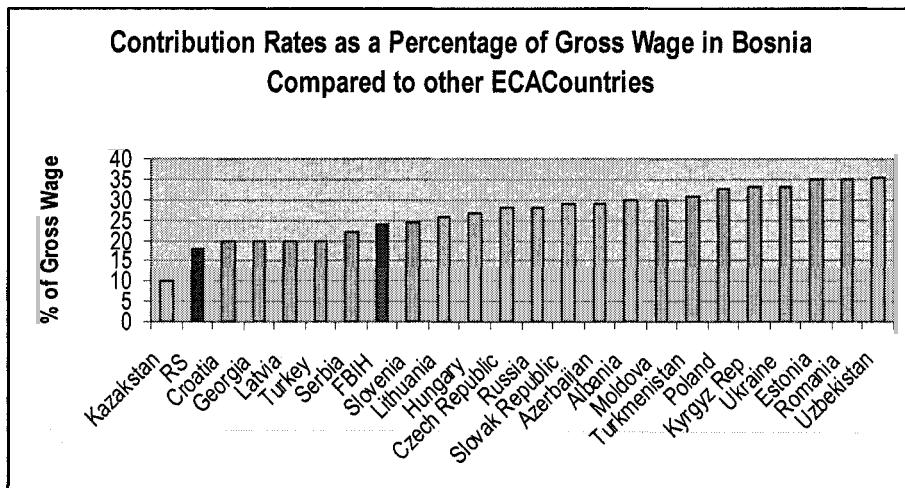
Figure 1: Comparison of BH Contribution Rates with Those in OECD Countries



18. When BH contribution rates are compared with ECA region contribution rates, the comparison is far more favorable. Figure 2 shows this comparison with BH rates on the low end of the ECA region. Contribution rates in transition countries were typically higher than in OECD countries since the enterprises merely handed over a portion of the wage bill to the social insurance agencies, not bound either by market-driven wage rates nor by profit-making considerations. Transition brought a sharp reduction in the formal sector labor employment in all countries and consequently, contribution revenue, encouraging countries initially to

raise contribution rates on those who continued to contribute to compensate for the lost revenue. Only gradually as the level of the contribution rates became linked with increasing informalization have countries begun to lower their contribution rates.

Figure 2: BH Contribution Rates Compared to Those in Other ECA Countries



19. *Retirement Ages.* On retirement ages, the new ages in the BH system are relatively in line with international standards and progressive relative to the ECA region. Typically, international best practice suggests 65 for both men and women. These are the current retirement ages in the Federation. RS still maintains the option of a 5 year age differential between men and women, which cannot be justified on economic grounds given that women live longer than men and should eventually be eliminated. Compared to the ECA region, as shown in Table 3, the BH citizens have moved quickly and definitively toward achieving international standards and should be congratulated for doing so. However, it should be noted that there are opportunities for individuals to retire before the published retirement ages and many continue to do so. In RS, for example, based on the data provided for 2003, 36% of the men awarded old age pensions for the first time were below the then-retirement age of 62. Similarly, 32% of new women old age pensioners were below the retirement age of 57. Equivalent information was not available for FBIH, but early retirements are expected to be equally prevalent there, and these patterns are expected to continue given that the law allows retirement with 40 years of accredited contributions at any age. Various occupations are given extended credit per year of actual contribution so accumulating 40 years of credit before the minimum retirement age will be possible even in the future for a wide range of people.

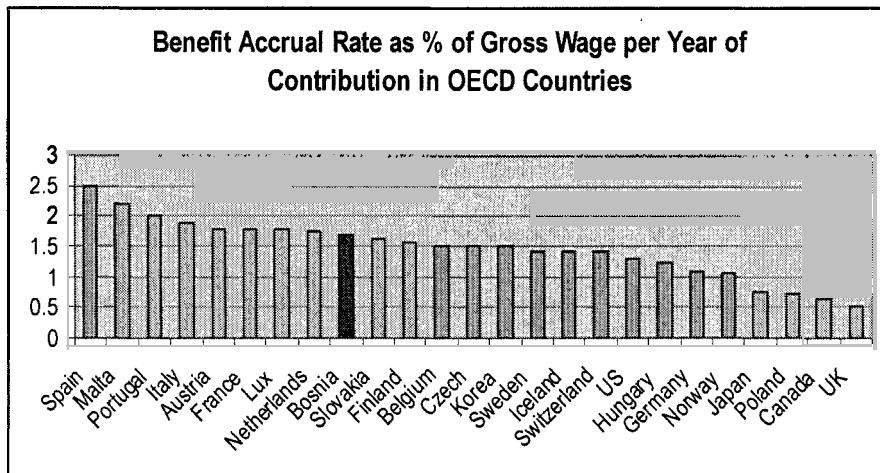
20. *Benefit Rates.* Similarly, the basic benefit structure, with 2.25% per year for the first 20 years in both systems, is reasonably sound. Assuming again that the gross wages are one-third higher than net wages, the basic replacement rate for 20 years of service, expressed as a percentage of net wages in the BH laws, converts to approximately 1.69% per year as percentage of gross wage. The OECD average is about 1.5% so again relative to other countries in the region, both systems have moved in a positive direction. Figure 3 shows the accrual rates in OECD countries relative to those in Bosnia and Herzegovina.

Table 3: Retirement Ages in Other ECA Countries

Retirement Ages for Men and Women in Other ECA Countries		
Country	Retirement Age for Men	Retirement Age for Women
Albania	65	60
Armenia	63	59.5
Azerbaijan	62	57
Belarus	60	55
Bulgaria	62.5	57.5
Croatia	63	58
Czech Republic	61.5	56-60
Estonia	63	59
Georgia	65	60
Hungary	62	60
Latvia	62	59.5
Lithuania	62.5	60
Kazakhstan	63	58
Kyrgyz Republic	62	57
Moldova	62	57
Poland	65	60
Romania	65	60
Russia	60	55
Serbia	65	60
Slovak Republic	62	53-57
Slovenia	58	55
Turkmenistan	62	57
Turkey	49	44
Ukraine	60	55
Uzbekistan	60	55

21. However, there are significant problems going beyond the basic replacement rate. The replacement rate *falls* rather than rises as workers work beyond 20 years, creating disincentives for further work. The fall is fairly severe in both systems for the second 20 years, going from 2.25% to 1.5%, falling by one-third. Rather than encouraging individuals to work longer, this type of benefit structure encourages short work periods. Long work or rather long contribution periods are further discouraged by a complete cessation of benefit accumulation after 40 years of contributions in both. Given that individuals might start work as young as age 20 or younger, both men and women in FBIH and men in RS have an opportunity to accumulate as many as 45 years of service and women in RS to accumulate 40 years of service. In both cases as many as 5 or more years are going completely unrewarded. No one will be willing to pay contribution rates as high as those in the BH system for absolutely no return. Clearly, the benefit structure needs to be flattened out, with either equal accrual for all years of service or increasing accrual for greater years of service.

Figure 3: Benefit Accrual Rates in BH Compared to OECD Countries



22. *Pensionable Base.* The pensionable base in both entities will be the average of the bulk of the working history, revalued for average wage growth, which is international best practice. In the case of the Federation, the number of years included are restricted to a maximum of 40, although this is being phased in between 2005 and 2015 from the previous average of any 15 consecutive work years. In RS, the averaging period includes all years since 1970 and those previous years for which work history is available.

23. *Indexation.* Indexation post-retirement is complicated due to the revenue constraint. When a pension is awarded, a pension is determined based on years of service and the average pensionable earnings. This is known as the base pension and is kept fixed in nominal terms. Each year, the base pension for each eligible pensioner is summed. The total expected revenue collection is then divided by the sum of the base pensions to derive a coefficient. If the coefficient is greater than 1, each pensioner gets an increase over his base pension; if the coefficient is less than 1, each pensioner gets less than his base pension. Thus, the only de facto indexation arises from the annual changes in coefficients. Rising real wages guarantee that pensions will rise each year by more than inflation as long as the growth in pensioners does not exceed the growth rate of contributors by more than the real growth of wages. International best practice suggests that pensions post-retirement should rise only with inflation, making the BH systems far more generous than best practice. Furthermore, while seemingly generous, there are inequities built into the system. For example, the coefficient at end of 2005 in the Federation stood at 1.15, indicating that all pensioners would receive 15% more than their base pension. Thus, the person who retired in 2004 based on 2004's nominal wages gets the same 15% increase over the base pension as the person who retired in 1990 based on 1990's nominal wages. The 15% over base pension may not be sufficient to cover even the cumulative inflation since 1990, effectively giving this individual a lower real pension than that to which he was initially entitled, while giving the new retiree an indexation far more generous than even wage indexation.

24. Furthermore, while the laws in both systems indicate that military pensions need to be paid from the budget, not from contribution revenue, only in RS is the budget actually providing the resources. Similarly, merit pensions are being paid from the budget in RS as

well as the increased amounts required for the minimum pension. Thus, of the “revenue” used for calculating the revenue constrained pensions in RS, 40% comes from the budget with only 60% representing true contribution revenue. Even with this amount of budgetary support, RS is running a small deficit. Given the political decision to move the coefficient to 1, RS deficits are expected to continue in the future.

25. The situation in RS gets even more complicated by pensioner groups interpreting coefficients below 1 as signifying the accumulation of arrears in the pension system, arrears which are being requested to be paid to pensioners today. The revenue constraints in the laws in both systems explicitly rule out the buildup of arrears.

26. Given the evolution of the pension systems in the entities and given that both pension funds have now reached or exceeded a coefficient of 1, it may be an appropriate juncture to move to explicit inflation indexation to contain costs and provide cost of living security. Inflation indexation post-retirement is the international norm, common in most OECD countries. Many countries in the region like Serbia and Poland have moved to inflation indexation post-retirement and even a formula like that of Croatia which indexes 50% to inflation and 50% to nominal wage growth would be preferable to the current system which is de facto 100% nominal wage growth indexation or more.

27. *Disability pensions.* A number of issues arise with regards to disability pensions. Aside from the potential double coverage given to war veterans who can claim benefits from both the war veterans’ bureau and from social insurance, disability in both entities is defined as the inability to perform one’s last job. Internationally, this is a relatively generous definition of disability. Disability is often defined as the inability to perform any job. Many of the neighboring countries have redefined disability in this manner and have successfully reduced the number of new disabled to less than 40% of their previous annual number. Compounding that issue, the level of disability benefits is more generous than old age benefits. An individual who has reached 65 years of age and has only 20 years of contribution history would be better off declaring himself disabled than in claiming an old age pension to get a 2.5% accrual rate per year rather than the 2.25% that the old age system provides. In fact, if one has only 15 years of contributions (one-third of the period between age 20 and 65), the individual can still claim 50% of net wage which is an even higher accrual rate of 3.3% per year of contribution. While the simulations presented in the next section assume a reduction in the rate of disability in both entities, given the impact of the war, it is not clear that the incentives provided by the pension system design will in fact result in a decline in the disability incidence.

28. *Survivor Pensions.* International best practice suggests that widow and widower pensions be made available at retirement age for those who are not entitled to pensions for their own work of higher value and who have not remarried. Children who are full-time students, typically up till the age of 18 or 21 also receive pensions. BH survivor practice is a bit of a mix. Widows are able to receive pensions well below retirement age, at age 45. However, if they have not reached age 45 at the time of the death of their spouse, they become ineligible for a widow’s pension unless they are disabled or raising children. In the Federation, the rules are slightly more lenient; if the widow has reached age 40 at the time of

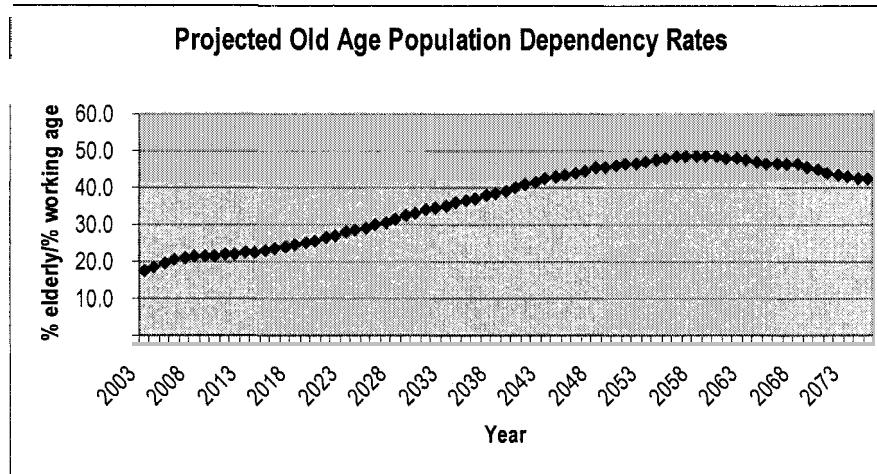
the death of her spouse, she becomes eligible for a widow's pension, but must wait until reaching age 45 to receive it. Since most women are raising children until age 45, essentially all widows are eligible to receive the widow's pension, but some unfortunate women who might not have had children and who suffer the early loss of a spouse lose the rights to a widow's pension permanently. Men, on the other hand, receive the widower's pension if they have reached age 60 in the Federation and 55 in RS. As with the widow's pension in the Federation, widowers five years short of the specified age become eligible, but must defer receipt of the pension until they reach the specified age. Again, if they are disabled or raising children, they receive the pension at any age as long as the disability or children are present. But again, some men are getting excluded, while others are receiving the pension at a relatively young age.

V. PROJECTIONS OF THE CURRENT SYSTEM

29. This section presents the results of pension projections for the two BH pension systems. The projections are created using the World Bank PROST model which has been used for pension projections in over 80 countries. Before proceeding, however, a note of caution is warranted. Pension projections depend heavily on population projections. No census has been taken in Bosnia and Herzegovina since before the war in either entity or at the state level. The projections presented below use the World Bank population projections database for future projections of BH population at the state level. Comparisons with the data produced by the entity level statistical agencies suggest that the initial population estimates are high. However, in both cases, the entity level information is pure estimate, given the lack of a census and the subsequent war casualties, migrations, and general upheaval. Since each entity employs its own methodology in producing these estimates and the estimates produced were not sufficiently disaggregated to be useful for pension projections, the results shown rely on the World Bank projections for all of Bosnia and Herzegovina, which are disaggregated and are produced in a consistent manner. All ratios, such as contributor or pensioner coverage rates, which show a low number of pensioners or contributors as percentage of population in a particular age group should be treated with caution since the denominator, the population in that particular age group may be overstated, while the numerator is an actual number. On the fiscal side, it is hard to determine whether the results are biased toward the high or low side without knowing in which age and gender groups the population estimates differ from the ones used.

30. Based on the population projections, the old age population dependency rate, the percentage of the population aged 65 and older divided by the percentage of the population aged 15 to 64, is expected to grow from the current level of 17.6, peaking at 49 in 2059, and then falling slightly to 42.4 by the end of the simulation period in 2075. Figure 4 shows the old age population dependency rates for the entire simulation period, 2003 to 2075. The changes are not initially that substantial as the growth in the elderly population is only slightly higher than the growth in the working age population. In the medium run, the number of elderly continues to grow while the working age population declines. But as the smaller working age cohorts reach retirement age, the number of elderly begins to fall as well, bringing the ratio down slightly. Life expectancy at birth is expected to rise from 71 for men and 77 for women at the beginning of the period to 80 for men and 86 for women over the course of the simulation period. More detailed information can be found in the Technical Annex.

Figure 4: Projected Old Age Population Dependency Rates in BH, 2003-2075



31. However, the system dependency rates are another matter. As Figures 5 and 6 show, the old age system dependency rate, defined as the number of old age pensioners divided by the number of contributors, is 45% higher than the old age population dependency rates for the Federation. While the population dependency rates are calculated on the basis of an age 65 retirement age for both men and women, exceptions to this policy were granted until 2008. As a result, many younger individuals continue to retire as old age pensioners. Eventually the system dependency rate falls below the population dependency rate, as a fewer percentage of the elderly have access to pension benefits due to their failure to make contributions during their working life. In RS, the situation is a little worse starting with a 54% discrepancy between system old age system dependency rates and population dependency rates. This will decrease over time, but only to 14% since women are given the option of retiring at age 60 rather than 65 even in the long run in RS, while the population dependency rates are based on age 65 for both men and women.. When looking at total system dependency rates, defined as total number of beneficiaries divided by total contributors, the situation is much worse. The dependency rate is more than three times the old age population dependency rate in both entities and only falls to a little more than twice over time. The high total system dependency rate reflects the large number of disability and survivor pensions. The modeling assumes that the disability and survivor pensioners as a percentage of their respective age and gender cohorts fall by half in the long run, giving rise to a lower differential, but given the incentives in the disability system, it is not clear that that will necessarily happen.

Figure 5: Pension System Dependency Rate in FBIH

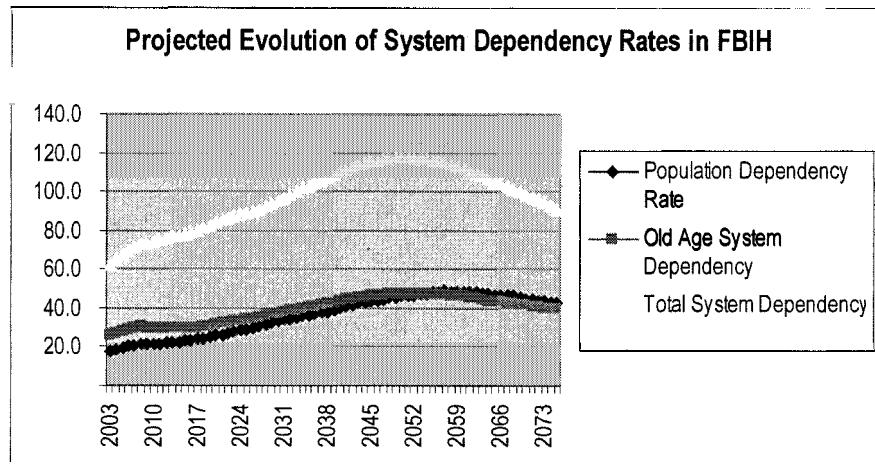
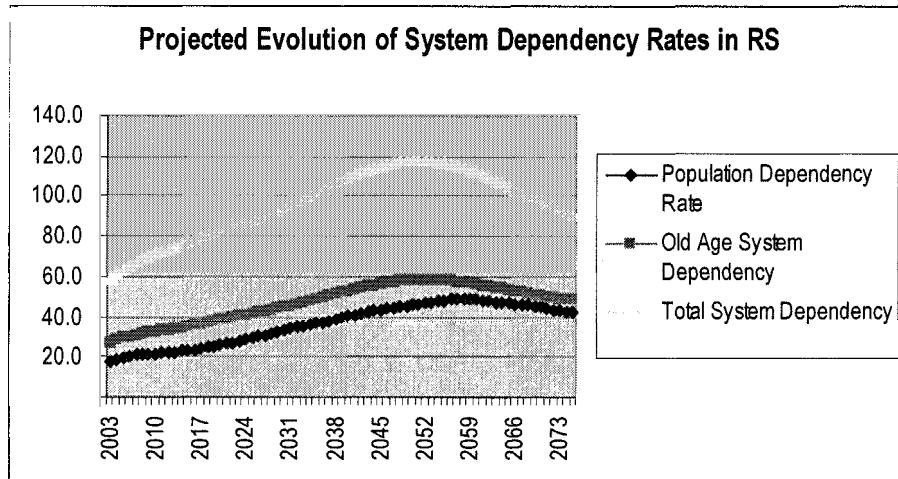


Figure 6: Pension System Dependency Rate in RS

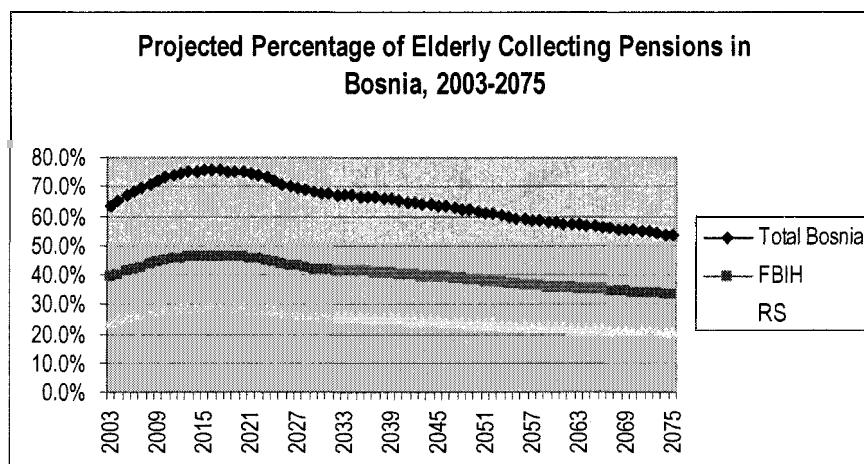


32. Note that even with the projected decline in disability and survivor pensions, the number of pensioners will exceed the number of contributors in less than 30 years and will remain at those high levels for the bulk of the simulation period, making it difficult to finance a pension system on a PAYG basis. PAYG pensions are based on the principle that contributions from current workers will be used to pay current pensioners. If there are equal numbers of pensioners and contributors, and if contributors pay a contribution rate equal to 24% of wage, then the pensions on average cannot exceed 24% of wage, without running a deficit. Old age pensioners may receive more than survivors, so that some pensions will be higher than 24%, but some also lower than 24%. When pensioners exceed contributors, the average pension will be even lower.³

³ Disaggregated projections by type of pensioner and by gender and for contributors by gender can be found in the Technical Annex.

33. A second notable feature is the fall in pensioner coverage. Currently as shown in Figure 7, 63% of individuals in BH aged 65 and over collect some form of pension. This percentage will rise to 76% of the elderly by 2016, but then will fall 53% in the longer term future. Some of this is due to the assumed reductions in survivor pensions and disability pensions. But those individuals who do not collect disability pensions are assumed to continue contributing until retirement age and are assumed to collect old age pensions. Even with this addition to the number of old age pensioners, the percentage of the elderly collecting old age pensions drops in the future, as many workers in today's informal sector will not have accumulated enough contribution years to become eligible for old age pensions.

Figure 7: Projected Pensioner Coverage in BH, 2003-2075



34. Moving from the demographics of the systems to the financial projections, the model requires assumptions on a number of key macroeconomic variables, including real GDP growth, real wage growth, and the inflation rate. The major assumptions used are noted in Table 4 below and are further discussed in the Technical Annex. Real wage growth rates are calibrated to maintain labor share of GDP given changes in labor supply and GDP growth rates in the individual entities.⁴

Table 4: Key Macroeconomic Assumptions Used in the Projections

Macroeconomic Trends	2003	2004	2005	2020	2040	2050	2075
Real GDP growth	4.0	5.7	5.3	5.3	5.0	5.0	5.0
Real wage growth							
Federation	5.0	4.0	3.4	4.5	6.0	6.0	4.0
R. Srpska	10.0	10.0	10.5	6.0	5.5	5.0	5.0
Inflation rate	1.4	0.8	2.5	3.5	3.0	3.0	3.0
Real discount rate	4.0	5.7	5.3	5.3	5.0	5.0	5.0

⁴ While one might have expected long run convergence of the wage growth rates in the two entities, the issue is that the age distribution of the labor supply is significantly different across the two entities. Allowing the age structure in each entity to evolve purely due to demographics results in these differing rates of wage growth. Should migration between the entities occur, of course the wages themselves would converge, leading to eventual convergence of wage growth.

35. Furthermore, the two pension funds are assumed to maintain their current policies regarding the coefficient. The Federation pension fund is assumed to maintain the strict revenue constraints on pension expenditures with no budgetary subsidies. The RS pension fund is assumed to maintain its coefficient at one while allowing the government to provide budgetary transfers. Given the politicization of this issue, it is unlikely that the coefficient in RS will be allowed to fall below 1, even if there are insufficient revenues to pay pensions. Already this year, the expenditures each month are exceeding the revenues, resulting in delays each month in pension payment. Eventually a full month will be skipped requiring either budgetary transfers or the build-up of arrears which is forbidden by law. Figures 8 and 9 show the financial projections of these budgetary transfers. As expected, no budgetary transfers are required in the Federation, while deficits in RS peak at 1.8% of GDP in 2044. Note that the denominator is GDP for all of BH. If RS maintains its current share of one-third of BH's overall GDP, the projections suggest a deficit of more than 5% of RS's GDP which will be enormously difficult to finance. Furthermore, the deficit does not tell the full picture. The RS pension fund requires significant transfers to the pension fund to cover merit pensions and the difference between the earned pension and the minimum pension. These transfers currently amount to 0.6% of GDP, but are expected to fall to 0.3% of GDP in the long run, based on consultations with the RS pension fund staff and the RS Ministry of Labor. However, it is not clear that the budgetary transfers required to support the minimum pensions will in fact fall as will be explained below, suggesting that the long run may see higher transfers and lower deficits. But either way, these are budgetary resources that the Government will need to provide to the pension fund. The combination of the two, as shown in the lower line of Figure 9, is a measure of budgetary requirements from outside the pension fund, regardless of the composition of those funds between legislated transfers and covering of the deficit.

Figure 8: Projected Balance of Revenues and Expenditures in the Federation Pension Fund

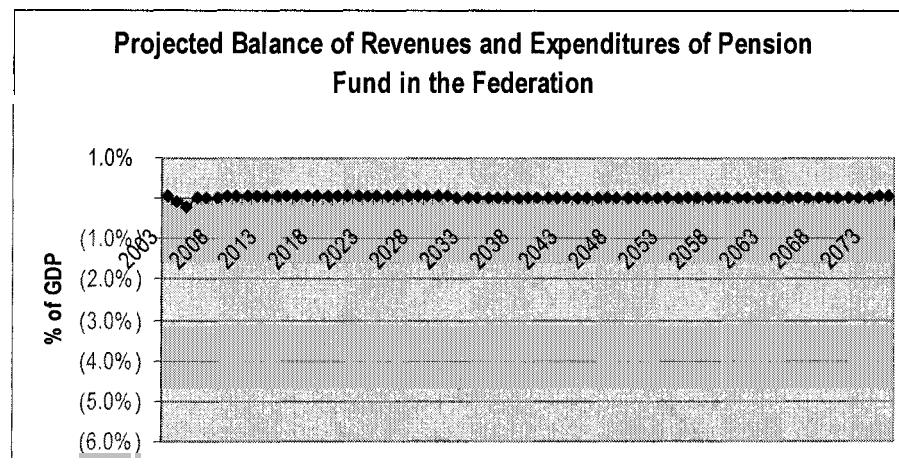
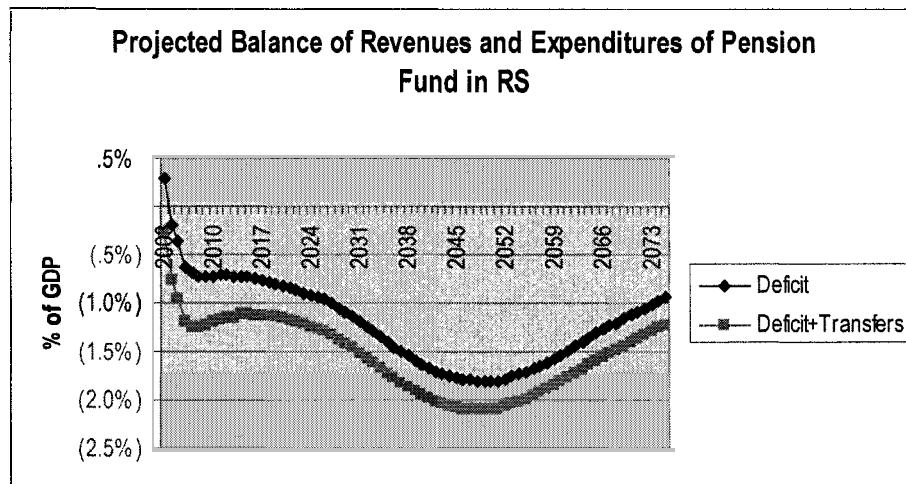


Figure 9: Projected Balance of Revenues and Expenditures in the RS Pension Fund



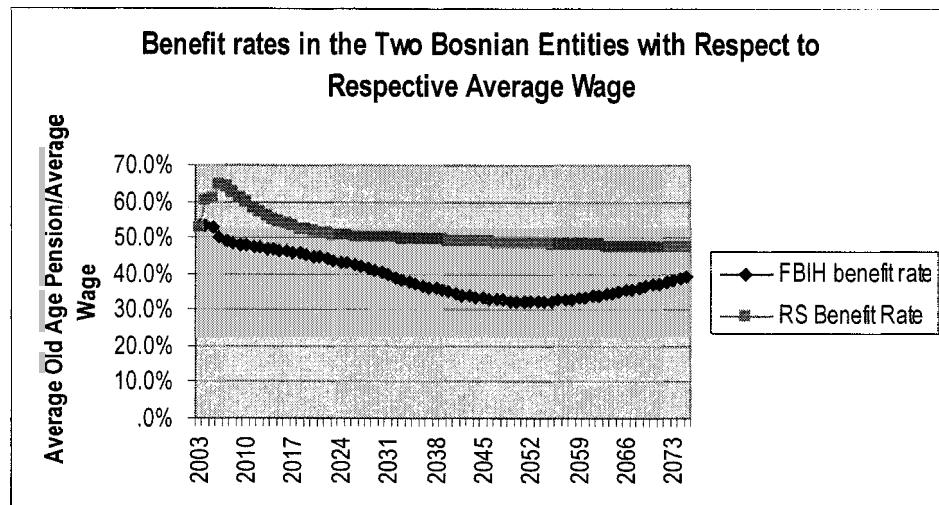
36. However, the fiscal picture is only part of the story. The level of benefits provided shown in Figure 10 tell a different story. Benefit rates in both entities are expected to fall relative to average wages in the entities due to the lack of formal indexation, although not so sharply in the case of RS. The levels relative to the respective average wages are similar today, although they were considerably lower in RS in the years when the coefficient was below 1. In both entities, the benefits fall relative to average wage because benefits are not indexed while average wage continues to grow. In the Federation this is compounded by growth rates in the coefficient which are below the rate of wage growth.⁵ Furthermore, the coefficient is expected to begin falling in 2018 and will actually fall below 1 by 2039 due to the aging of the population. The falling and negative coefficient results in a reduction in even the nominal level of benefits which combines with the growing level of wages to sharply reduce the level of benefits relative to average wages. Eventually as the number of pensioners is reduced, the coefficient begins growing again, resulting in the rise in the benefit rate towards the end of the period.

37. In RS, with the coefficient assumed at 1 throughout, the reduction in benefits arises strictly from the non-indexation of benefits in the face of growing nominal and real wage growth. However, this decline is tempered by the policy regarding the minimum pension in RS. While it is not legislated as such, the Parliament has regularly raised the minimum pension to more or less match average wage growth. Legally, the Government is obligated to cover the difference between the minimum pension provided and what the individual actually earned. By contrast, in the Federation the minimum pension is subject to the same coefficient as other pensions. As a result of this policy, RS is able to maintain the level of pensions relative to average wage over time, since the minimum pension maintains its level relative to average wages while the above minimum pensions are completely unindexed, driving the majority of pensioners toward the minimum in the long run. The RS government

⁵ If the number of pensioners, the number of contributors, and the age distribution of the contributors were perfectly constant over time, the coefficient would be expected to match the wage growth exactly. However, since all three variables are constantly changing, the coefficient will grow less than wage growth at the beginning of the period.

has assumed that the cost of legislated transfers will fall over time as the cost of military pensioners and other groups borne by the Government rather than the pension fund fall. However, this second legislated transfer for minimum pension recipients is unlikely to fall over time if the current practice of maintaining the minimum pension relative to average wage remains. Thus, while the simulations in Figure 9 show a reduction in transfers in the long run, this minimum pension component should rise substantially, suggesting that the composition of the required budgetary support between deficit coverage and legislated transfers in Figure 9 is unlikely to be correct, although the total amount is representative.

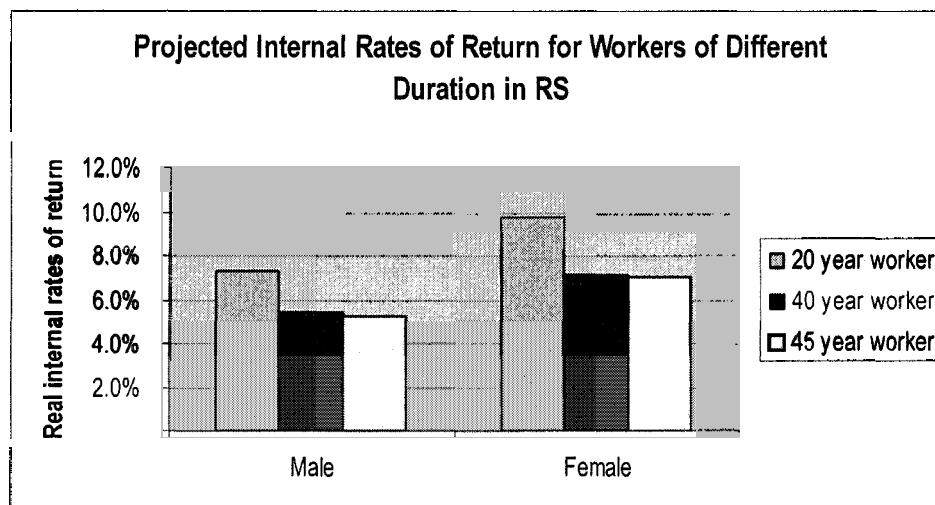
**Figure 10: Projected Average Old Age Benefits Relative to Average Wage
in the Two BH Entities**



38. While the simulations assume that contributor coverage rates will not rise, they also assume that the length of service for contributors will remain at current levels which are between 34 and 40 years of service for most retirees. These assumptions are relatively consistent with the observation that the majority of contributors are in the public sector or in stable formal sector jobs, while the rest of the working age population works in the informal sector and does not contribute. However, the incentives built into the system do not encourage such long contribution periods. Given the revenue constrained change in benefits in the Federation, internal rates of return for contributors are a bit difficult to calculate. Since the policy of high accrual rates for the first 20 years is common to both systems, followed by lower accrual rates for the next 20 years and no benefits subsequently, the incentives in RS shown below apply to both schemes. What is readily apparent from Figure 11 is that the 20 year worker, the man who starts contributing at age 45 and retires at age 65 has a much higher rate of return on contributions than the man who begins to contribute at age 25 and accumulates a full 40 years of contributions, 7.3% vs. 5.4%. The worker who begins to contribute at age 20 and contributes 45 years until reaching age 65 receives no additional benefits for the additional 5 years of contributions and earns an internal rate of return of only 5.3% on the 45 years of contributions. Women get better rates of return than men in RS for two reasons, only one of which applies to the Federation. In general, women live longer than men, increasing the total benefit they receive, which will be true in both entities. In addition, in RS, women are given the option of retiring 5 years earlier, resulting in a rate of return

more than one-third higher than that awarded to men. The same pattern continues, with the woman who starts contributing at age 40 to retire at age 60 earning an 9.8% internal rate of return, while the woman who starts contributing at age 20 earns only a 7.2% rate for return. The longest contributing woman in RS was assumed to begin contributing at age 18, and thus contributes only 42 years before retiring at age 60, but the additional 2 uncompensated years of contributions are sufficient to reduce her internal rate of return to 7.1%. These rates of return are real rates of return, above the rate of inflation.

Figure 11: Projected Internal Rates of Return for Workers of Different Duration Beginning Work in 2003 in RS



39. The incentives built into the system thus suggest that even the unsustainable results shown by the projections are optimistic. If people responded to these incentives by contributing only the minimum period necessary to become eligible for benefits, while at each point in time only the current number of contributors as a percentage of the working age population continued to contribute, the fiscal situation would dramatically worsen as the number of beneficiaries increased dramatically.⁶ Benefit levels to be paid in the future would be reduced since individuals receive pensions based on 20 years of contributions, not on 35 or 40, but not by as much as the number of beneficiaries are increased, as evidenced by the rise in the internal rates of return. And in RS instead of reducing benefits, even more individuals would find themselves receiving the effectively wage-indexed minimum pension, forcing even more costs onto the government. If the further disincentive effects of the disability eligibility and benefit structure were to be built into the projections, the picture would only look worse.

40. In summary, the problems of the BH pension system can be divided into three categories:

⁶ If each contributor only contributed for 20 years out of a potential 45 year working span, one could imagine one individual in a particular cohort working for the first 20 years of the working life, a second individual working the second 20 years of the working life, and a third individual working for 5 years. Thus, the same contribution coverage rate would generate two or more retirees when that cohort retires. On the other hand, if the person contributed for 45 years, the same coverage rate only generates one retiree.

- (1) The pension system parameters are different across the two entities, providing an impediment to labor mobility across the two entities;
- (2) The parameters in both entities are socially and fiscally unsustainable as they now stand, due both to the low future level of benefits and in RS to the need for enormous budgetary transfers; and
- (3) The incentives in the benefit design and eligibility systems promote shorter contribution periods, encouraging rather than discouraging participation in informal labor markets, with major implications for fiscal sustainability.

VI. PARAMETRIC REFORMS HARMONIZING PARAMETERS ACROSS ENTITIES

41. At the very least, parametric reforms need to be undertaken, which will harmonize the pension systems across the entities with the aim of bringing both systems closer into balance and bring them into compliance with international norms in the cases where there is some discrepancy. While these reforms may not bring the systems fully into a sustainable equilibrium, there are potentially additional measures which may be used once the harmonization has been achieved.

42. Table 5 presents one example of what a harmonized policy might look like and summarizes the main characteristics which would change. It should be emphasized that this is just an example and the Government may choose a different combination of parametric changes and phase-in periods. Most of the changes are projected to be enacted immediately as of 2007, with the exception of the retirement age for women in RS, which has a very short phase-in period. Disability rates and survivor rates are expected to fall to 50% of current levels within 20 years instead of over the whole simulation period, which allows time for the war impact to disappear and a slightly more aggressive approach on expenditure control to take hold.

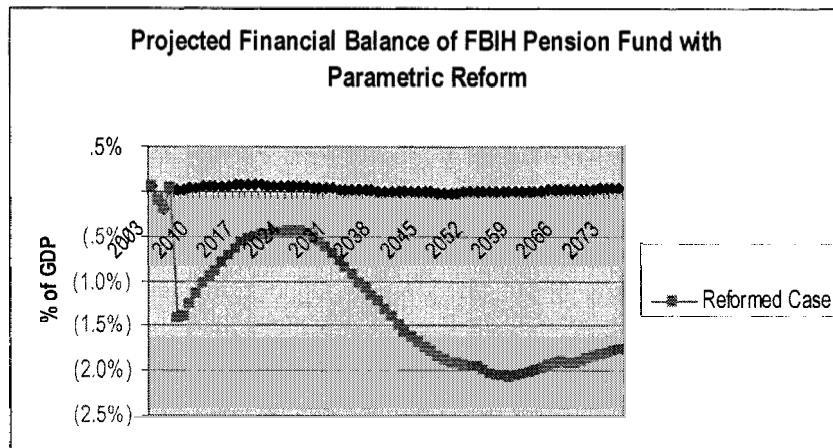
Table 5: Proposed Parametric Reform, Harmonizing Parameters Across Entities

Proposed Measures	
Contribution Rates	24% of net wage
Retirement age	65 for both men and women by 2011
Accrual rates	Flat 1.5% of net wage per year of contribution, with no maximum imposed
Indexation post-retirement	Removal of revenue constraint on pension expenditures and imposition of inflation indexation of benefits post-retirement
Disability and survivor pensions	Faster reduction in disability and survivor rates, falling to 50% of current rates by 2026

43. Figures 12 and 14 show the impact of the reforms on the financial projections of the pension funds in both the Federation and RS. As is clear from Figure 12, the Federation pension fund will immediately fall into deficit, arising primarily from the more than 25% reduction in the contribution rate and the removal of the revenue constraint on pension expenditures. Two items should be noted with regards to this deficit. Technically, by law, the military pensions or the difference between military pensions and regular pensions are supposed to be paid by the budget. Currently, the military pensions are typically paid by the pension fund itself with few or no budgetary transfers. An argument can certainly be made that the cost of military pensions should be borne by the population at large and not by the current workers alone. Secondly, the small surplus which has arisen in the pension fund has given rise to the notion that additional groups within the Federation such as Parliamentarians should receive additional benefits, paid for by the pension fund. Moving the pension fund into deficit will make the fiscal implications of any such political gift-giving much stronger and more transparent. These benefits can still be increased, but there will be an explicit, transparent cost which taxpayers will have to choose to incur. However, if despite these

considerations, the budget is unable to afford reducing the contribution rate right away, the reduction could be phased in to minimize the immediate impact on the budget.

Figure 12: Projected FBIH Pension Fund Balance with Harmonization of Parameters



44. Figure 13 shows the impact on expenditures alone as a percentage of GDP in the Federation. Initially, expenditures fall relative to the base case since the coefficient in the base case is greater than 1 and rising, signifying growth in pension levels above that of inflation. While the growth in the coefficient is not sufficient to match the relatively high real wage growth levels, it is more than sufficient to match the relatively low inflation levels. Furthermore, the accrual rates for pensions are falling by 25% although these only affect new pensioners, and the number of disability and survivor pensioners are falling faster than in the base case. However, as the coefficient falls below 1 in the base case, nominal pensions will fall, making reformed pension expenditures with their automatic inflation indexation naturally higher. The effect of the indexation is great enough to overcome the impact of the lowered accrual rate and the reduction in the number of disability and survivor pensioners, but at the end of the period, the pension expenditures are almost exactly where they would have been under the base case.

45. The RS pension fund, on the other hand, with its heavy reliance on budgetary support already, would show marked improvement in its financial balance as shown in Figure 14. The improvement arises primarily from the lowering of the accrual rate and the move to a faster reduction in the disability and survivor rates. Since the distinction between legislated transfers and the deficit itself is somewhat fluid, given the important role of the minimum pension, the lines below show the total budgetary requirement in RS under the reform and in the base case.

Figure 13: Pension Expenditures in FBIH pension fund as percentage of GDP

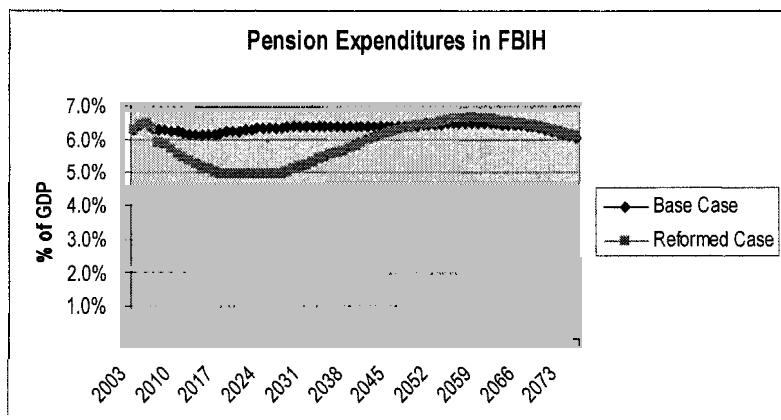
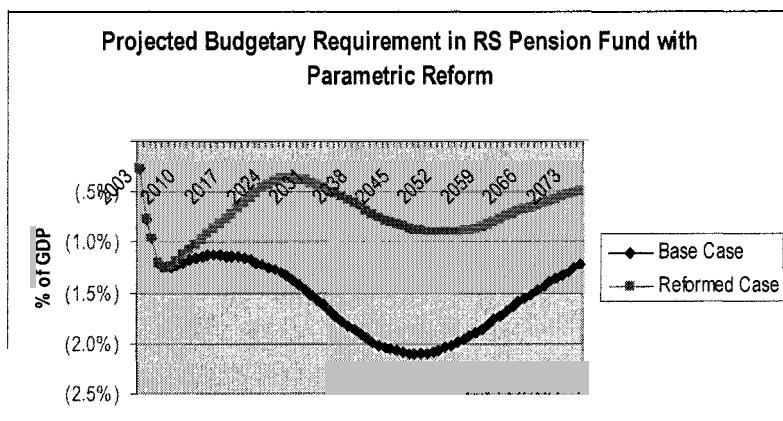


Figure 14: Projected Budgetary Requirement in RS Pension Fund Arising from Harmonization of Parameters



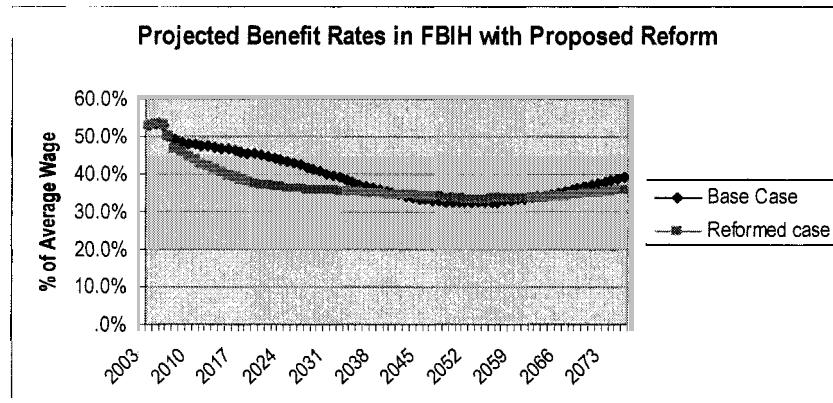
46. In both cases, there are still sizable deficits at the end of the period. However, once the harmonization is complete, the retirement ages in the very long run, after 2050 could be gradually raised in line with increasing life expectancy, eliminating the long run fiscal deficits in both pension funds. In neither case do the projections assume increased contributor coverage through increased formalization. The decline in the FBIH contribution rate may in fact have some impact in decreasing informality. Neither projections include impacts from the flattening of the accrual rate and the removal of the disincentives for longer careers or from changing the incentives in the disability system. Any response on the part of contributors to the change in incentives will only improve the fiscal situations, such that Figures 12 and 14 represent the worst case scenarios. The only assumption with regard to disability is that the war-induced effects are eliminated in the next 20 years.

47. Other areas which could generate lower future expenditures including reviewing the provisions for granting extended duration, the additional credit given for actual years of contribution. Typically, the former Yugoslavia was excessively generous in granting extended credit. Many of these provisions are retained in the entity pension laws and should be reviewed, with those who receive extended duration credit also being required to pay

more to receive those benefits. Related to this point, many individuals in both systems continue to retire early throughout the simulation period, partly due to extended duration benefits. Fully one-third of new old age pensioners are expected to retire before the normal retirement age in RS, and the same is true of the Federation. Furthermore, the definition of disability adopted in both laws, inability to perform one's last occupation, is quite generous by international standards. The definition more typically is the inability to perform any work. Review of disability pensioners in other former Yugoslav countries has shown a fair degree of fraud and has resulted in a significant reduction in expenditure. The same type of review may yield savings in Bosnia and Herzegovina as well.

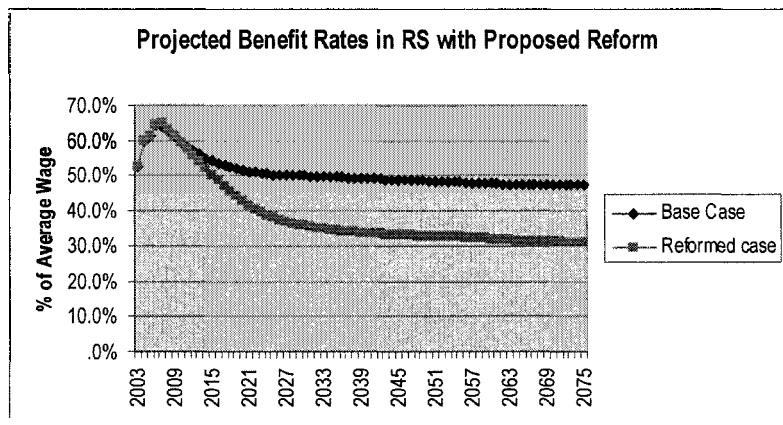
48. Turning to the benefit side, Figure 15 shows the impact on the benefit rate in the Federation of the harmonized parameters. The benefits are lower in the base case in the early part of the period since the benefit from the growing coefficient has been eliminated. But in the second half of the period when the coefficient is falling, the reform provides better value for the pensioner. Regardless of the lower benefits initially, the pensioner's objective is to maintain his purchasing power during retirement. The coefficient rule would not have done that and particularly not for older pensioners. Thus, the reform provides better protection for the pensioners. Furthermore, it should be noted that the contribution rate required to generate these benefits is 25% lower, improving incentives for workers.

Figure 15: Projected Benefit Rates in FBIH under Harmonized Parameters



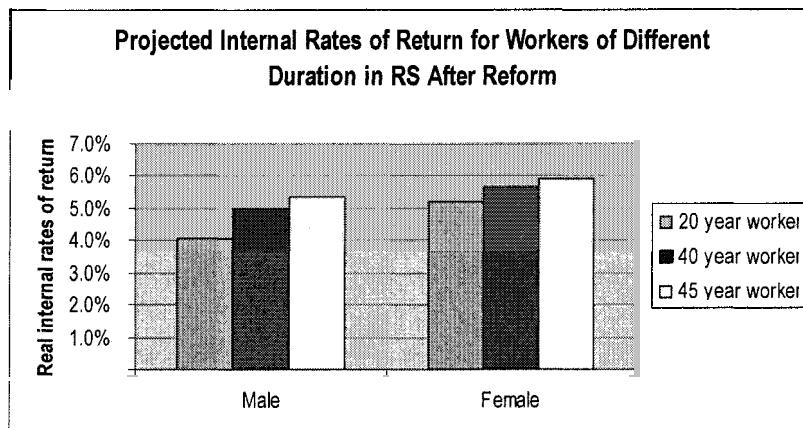
49. On the RS side, pension benefits definitely decrease as a result of the reform, as shown in Figure 16, for two reasons. First, there is a small decrease in the accrual rate, affecting new pensioners. But more importantly, the minimum pension is now assumed to be inflation-indexed rather than informally linked to wage growth as previously. From an economic and social point of view, the minimum pension should represent the minimum amount that the pensioner requires to live or some percentage of that. There is no inherent reason that this amount should rise with wage growth. As prices rise, the amount should rise to allow pensioners to continue purchasing what they purchased in previous year. Thus, inflation indexation of the minimum pension protects pensioners without incurring undue costs. Furthermore, it should be noted that the base case benefits were completely unaffordable and were thus unlikely to have actually materialized.

Figure 16: Projected Benefit Rates in RS under Harmonized Parameters



50. On the incentive side, Figure 17 shows the improvements in incentives under the new harmonized scheme. Workers choosing to contribute for only 20 years are getting substantially lower internal rates of return than workers choosing to contribute for 40 or 45 years, 4.1% instead of 5% or higher. Women still get higher rates of return than men simply because they live longer, 5.7% relative to the male 40 year worker's 5%. An additional point to note is that this real internal rate of return shown is the real rate of return that would be implicitly paid on contributions if the worker deposited his contributions in a bank account and the bank account were to pay benefits equivalent to what the pension system pays. The normal rate of return one would expect to receive is around 4% in real terms. This suggests that the BH schemes are still generous in what they are paying and could potentially be reduced further.

Figure 17: Projected Internal Rates of Return under Harmonized Parameters



VII. LONGER TERM PROPOSALS

51. While the harmonization of parameters and moving toward international norms is worthwhile, these policies by themselves will not resolve the issue that a little less than half of the elderly will not receive pensions in the future. While the policies advocated here are positive toward increasing formalization rather than negative, it is unclear whether they are sufficient to actually increase the level of formalization, which is why an increase in formalization was not included in the projections shown in the previous section. Typically, a number of factors impose obstacles to increasing formalization, including labor market regulations, other taxes imposed on the formal sector, as well as a variety of other business registration requirements. Unless these are removed together with the reduction in payroll taxes, the formalization does not tend to increase.

52. If we assume that formalization may not increase in the future, many elderly BH citizens in both entities will not have access to any type of pension in the future. In the absence of additional reform, the harmonization proposal from above will still result in a combined cost to the Bosnian entity Governments of more than 2% of GDP in the long term. One proposal would be to phase in an extremely minimal state pension, providing some assistance to all those who are elderly, and to downsize the pension provided by the pension funds even further. The details of this proposal can be found in Table 6. All of the parameters from the harmonized proposal remain except for those changed in Table 6. Again, this proposal is not the only solution, but simply an example to illustrate what such a proposal can achieve. The social pension will not be started until 2025, given that only in 2025 will workers begin retiring who have spent the bulk of their working career after the transition. Should the fiscal situation permit, the social pension could begin earlier. The social pension is set at 10% of per capita GDP, which is an extremely small amount, but this will be given to every citizen of BH from age 65 on. If given today, this would amount to a little more than 30 KM per month, which is clearly not an income on which an elderly person can sustain himself. However, the experience of other countries suggests that even a small supplement to the elderly helps lower the poverty among the elderly.⁷ The Government has a variety of choices. By raising the age at which the social pension is given, the amount could be increased. A social pension amount could also be determined and linked to inflation rather than linked to GDP growth, which could potentially allow the initial amount to be higher and subsequent amounts to be lower. Finally, the Government could decide to allocate more resources to the social pension.

53. In terms of changing of contributory pension parameters, retirement ages are moved to 68, but in the very long term, not beginning until 2050. The eligibility age for the social pension will be moved to match that of the contributory pension. But again, all of these parameters were chosen merely for illustration and can be changed.

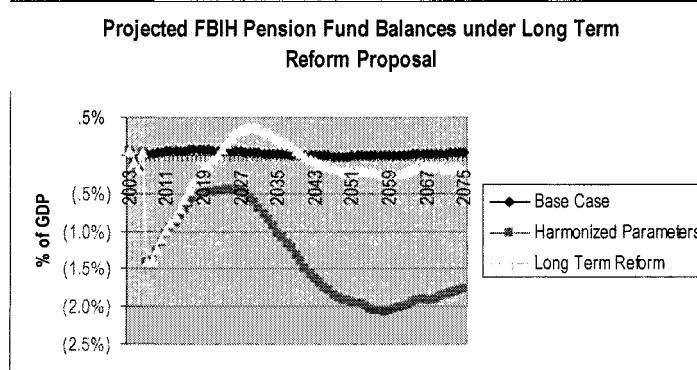
⁷ Palacios, Robert. Social Pensions working paper, 2006.

Table 6: Parameters for Reduced Contributory Pension with Added Social Pension

Pension System Parameters With Social Pension and Reduced Contributory Pension	
Social Pension	Available at age 65 at 10% of per capita GDP beginning in 2025
Retirement age	Rises to 66 between 2040 and 2050, to 67 between 2050 and 2060, and to 68 between 2060 and 2070
Benefit rate	Gradual reduction in accrual rate from 1.5% to 1% per year of contribution phased in over 20 years

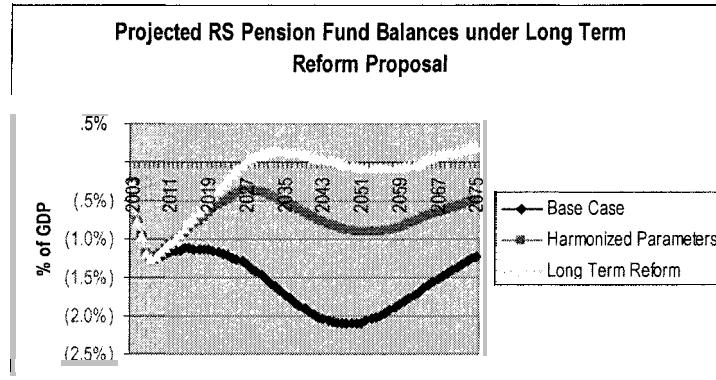
54. In this illustration, the FBIH pension fund goes into surplus in 2022 for a period of 18 years before a small deficit reappears, as shown in Figure 18. Ideally, the pension fund should avoid both surplus and deficit and, but as will be seen further below, the RS fund generates a small surplus with these same parameters, and in the interest of maintaining harmonized parameters, the FBIH fund may generate a small deficit even in the long run.

Figure 18: Projected FBIH Pension Fund Balance under Long Term Reform Proposal



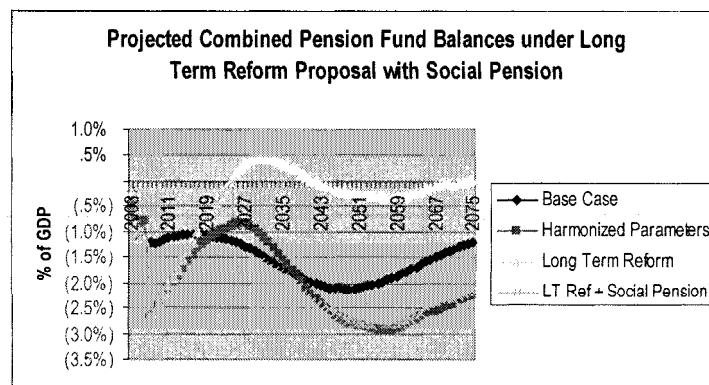
55. The RS pension fund goes into surplus around 2022 and remains there for the remainder of the projection period, as shown in Figure 19. All three projections shown in Figure 19 include the legislated transfers. Including the transfers, the long term reform shows a rough balance after the next 20 years.

Figure 19: Projected RS Pension Fund Balances under Long Term Proposal



56. The combined pension fund balances are shown in Figure 20, both with and without the social pension. Without the addition of the social pension, the combined systems will be in balance, including the RS legislated transfers, right up till the end, providing the fiscal room to provide the social pension. The sum of the combined pension fund balances and the cost of the new additional social pension mimic the costs of the parametric reform which only harmonizes the parameters. The Government largely moves out of the business of subsidizing contributory pensions, allowing them to be mostly self-financing while providing resources from general revenue which improve the lot of all elderly.

Figure 20: Projected Pension Fund Balances from Both Pension Funds under the Long Term Reform Proposal with and Without the Social Pension



57. Will the long term proposal result in a drastic drop in benefits? Figures 21 and 22 show the impact on the benefits provided to the elderly by both pension funds. The social pension will be provided to participants of both pension funds in addition to what they will get from the contributory systems. Figure 20 shows that for the Federation, the long term reform with the social pension generates somewhat lower benefit rates than either the base case or the harmonized parameter reform, but we know that the harmonized parameter case requires substantial subsidies from the government and thus was not sustainable. In the case of RS, the pension is about the same under the long term proposal as it was under the harmonized parameter proposal, but well below the base case. But since the base case was fiscally unsustainable, it is clear that the higher benefit rate would not have remained.

Figure 21: Projected FBIH Benefits under Long Term Proposal with Social Pension

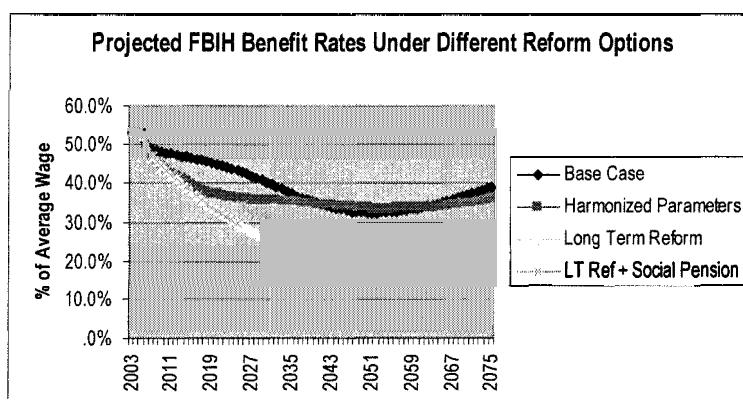
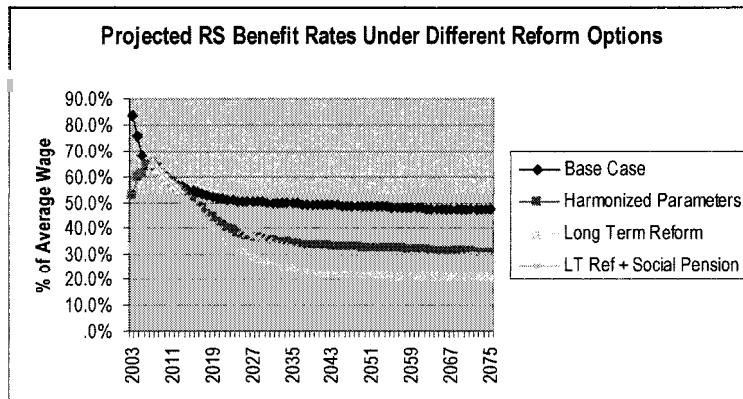
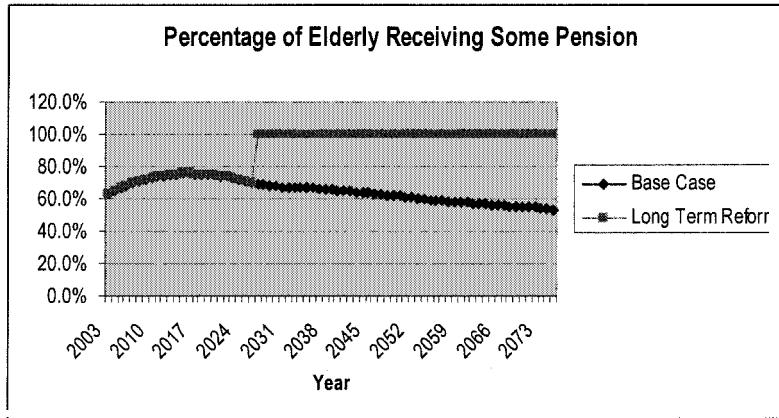


Figure 22: Projected RS Benefits under Long Term Proposal with Social Pension



58. What are the advantages of the long term proposal? Benefits are somewhat lower in the Federation, but remain roughly the same in RS. Some benefits are provided to all the elderly, including the majority who will receive nothing under the current systems. Figure 23 shows the increase in percentage of the elderly receiving some pensions as a result of the long term proposal.

Figure 23: Percentage of Elderly Receiving Some Pension with the Social Pension



59. Note also that no economic impact has been built into the projections. Should the improvement in incentives increase the duration of worker contributions, both pension funds will show financial improvements in their fund balances, potentially generating the capacity for higher benefit payments. And the level of the social pension is sufficiently low to minimize disincentives for contributing to the pension funds. If individuals would like higher pensions, the room has been created in their own net incomes to allow additional savings on a voluntary basis.

60. Finally, as noted in the previous section, the internal rates of return even under the harmonized parametric reform are higher than would be paid in the market on contributions, indicating a moderately high degree of generosity in the systems. Moving to the long term

reform would reduce the internal rates of return to internationally comparable rates. Figures 24 and 25 show the impact of the long term proposal on internal rates of return. Note that in both funds the internal rates of return are more or less equivalent to the 4% rate that financial instruments would yield for full career workers. Furthermore, the social pension is not included in the internal rate of return calculation; given that the social pension generates benefits without additional costs, full career workers will clearly achieve or exceed international norms. Furthermore, given that the generosity of the system is now approaching that which financial markets can provide, a move in the longer run toward privately provided defined contribution pensions, should this be considered advantageous, will result in fiscal transition costs, but no appreciable loss in benefits. The differences in the rates of return shown across the two entities arise from the differences in wage growth where RS is projected to experience higher wage growth as its salaries rise from lower initial levels.

Figure 24: Projected Internal Rates of Return for FBIH Contributors under Long Term Reform Proposal

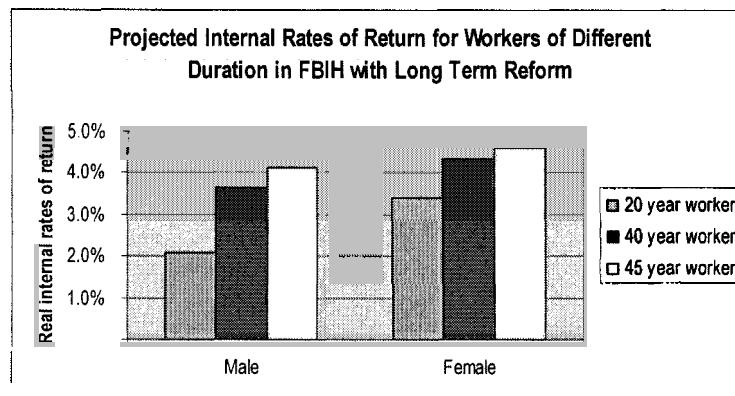
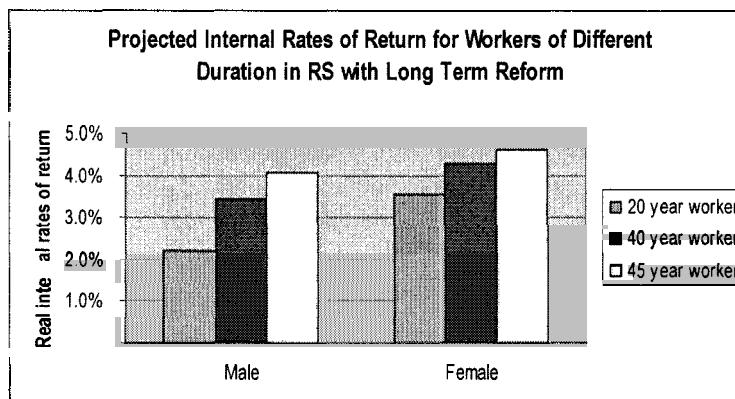


Figure 25: Projected Internal Rates of Return for RS Contributors under the Long Term Reform Proposal



61. Proposals to move toward a funded system, to be included as an integral part of the pension system (second pillar) or as a voluntary supplement to the existing scheme (third pillar), need to be carefully evaluated. Successful implementation of a second pillar would involve the Government's covering the pension expenditures of the current pensioners and

the soon to be pensioners from its own resources while all or some of the contributions from current workers are diverted to individual private pension fund accounts. Privatization proceeds are a source of potential resources to cover this transition, but they typically are available for a 2-3 year period while the transition period during which the government has to cover pensioners and pension rights typically lasts 20-40 years, depending on how the reform is designed. A second area for evaluation is the state of the financial markets. Are there sufficient financial market instruments, which offer reasonable returns without undue risk, in which to invest pension contributions? Is the regulation and supervision of the financial markets such that unsophisticated investors, such as the typical worker, can safely invest their lifetime savings and expect to receive a reasonable pension in 30 or 40 years' time? Is there a stable enough macroeconomic framework that the financial market can even provide long term instruments? Without these financial market and macroeconomic preconditions, the funded pension system will not provide adequate pensions, resulting in implicit liabilities for a government unwilling to allow its elderly to starve, but without access to the resources provided by worker contributions to a public pension system.

62. At the same time, the public pension system will clearly have to pay less generous benefits in the future. Reforms which enhance the financial market structure will allow individuals to save additional resources for themselves to augment the reduced pensions that the public system will pay, if they so desire. These reforms need to involve improvements in the full range of financial market instruments, including housing finance, since ownership of housing relieves the elderly of a major expense. The marketing of unregulated pension products while the financial market structure is evolving can often result in substantial losses to unwitting savers, making it more difficult to rely on products like these for some portion of retirement savings in the future. The Government is strongly encouraged to create the legal and institutional framework which can insure development of a healthy non-bank financial sector, including a pension product market, rather than allowing unregulated schemes to proliferate.

63. The public pension system will continue to require substantial resources from the Government in the medium term under whatever configuration of structural reform is eventually enacted. The Government is urged to focus its energies on reforms to this system, which can then create the fiscal room for a more substantive future reform, while it also creates the legal and institutional structure under which the financial markets can develop.

VIII. CONCLUSIONS

64. While enormous improvements have been made in the BH pension systems already, putting both entities far ahead of many of their transition economy neighbors in terms of pension reform, the current systems as they stand are both unsustainable. The Federation system is unsustainable because it is projected to pay low benefits in the future relative to its high contribution rates. The RS system is unsustainable because it increasingly relies on budget subsidies, subsidies which are projected to grow and become unfinanceable.

65. Both systems have adopted slightly different parameters, but both still contain some design problems which encourage shorter working careers and the growth of informalization. As a first step, the entity pension funds should work toward harmonizing their parameters and removing the disincentives toward long contributory periods and formalization.

66. However, in the longer run, both entities will face the political pressure of elderly populations where a large percentage of individuals have no access to pensions and support by the Governments. A longer term proposal further downsizes the contributory pension schemes, eliminating the need for Government. The Government would then fulfill the role of providing a social pension to all individuals above a certain age, providing some assistance to those without pensions and increasing the pensions of those who already collect somewhat smaller contributory pensions.

DATA ANNEX: INPUT DATA, KEY ASSUMPTIONS, AND METHODOLOGY

This appendix reviews the provided data for the analysis of the pension systems in Bosnia and Herzegovina. It presents data limitations, assumptions, as well as methodology used for the preliminary projections of the systems.

The conflict and BH independence led to three pension funds, one for each of the three ethnic groups, the Croat, Bosniac, and Serb. However, the Croat and Bosniac funds were merged in January 2002, leading to only one fund (the Federation fund) whose headquarters are located in Mostar,⁸ while Republika Srpska continues to maintain its separate pension fund headquartered in Bjeljina.

This annex presents the data for the analysis of these two funds: Federation, and Republica Srpska. It is organized into three sections. The first section summarizes the data availability as well as data limitations. The second section summarizes the methodology and assumptions (demographic, economic, and others), and the third section summarizes the preliminary projections on demographics and finances of the two programs.

Table 1 summarizes the main pension indicators of both systems.

⁸ The Croat and Bosniac funds continue to maintain separate IT systems which have never converged into a single database. So while the management of the Federation pension funds is unified, the physical infrastructure is not. Data were received from both IT systems.

Table 1. Main Pension Indicators of Bosnia and Herzegovina, 2003

Indicators	Republika Srpska	Federation
GDP (Mn) = 12,791.25 Population = 3,828,395 Av. Wage = around 5,000 KM considering both systems Working Age opulation (15-64) = 2,985,330 Labor Force = 1,950,302		
Retirement Age	Male 62, Female 57	Male 60, Female 55
Average Covered Annual Wage	4,455	6,584
Contribution Rates from Employers & Employees: (as % of covered wage)	24%	34%
Post-retirement Indexation	Adhoc (depending on revenues)	Adhoc (depending on revenues)
Number of Contributors (total)	294,044	465,998
Men	173,740	290,406
Women	120,304	175,592
Number of Beneficiaries (total) :	173,692	288,613
Old Age		
Men	56,883	87,095
Women	22,662	32,167
Invalidity		
Men	22,309	44,588
Women	9,993	20,539
Survivors (and Orphans)		
Men		8,819
Women	61,845	95,405
System Dependency Ratio	59.07%	61.93%
Total Expenditures (total in Mn KM)	312	805
old age pensions (females)	73.2	88.7
old age pensions (males)	223.6	289.2
survivor pensions (females)	86.7	203.7
invalidity pension (females)	15.5	33.9
invalidity pension (males)	37.2	81.4
pensions increase	-139.0	71.8
Administrative costs	14.4	36.6
Total Revenues (in Mn KM)	349	813
Current Balance	37.41	7.73
Coverage (Contributors/ Pop. 15-64)	9.85%	15.61%
Pensions Expenditure as % of GDP	3.41%	6.30%
Current Balance as % of GDP	0.3%	0.1%

SECTION I. DATA AVAILABILITY AND LIMITATIONS

The information the Bank received on population varies according to the estimates received from each statistical office.

Federation and Republic of Srpska

- *RS population (end 2003)*, Source: RS Statistical Office, by age/sex
- *FBiH population (end 2003)*, Source: Statistical Office, by age/sex

The total number of population according to these sources is: 1,463,465 in RS, and 2,323,339 in FBiH. (The total number of population in BH according to UN and WB database is higher, 4,010,000).

Careful consideration should be given to these numbers. Large population migrations during the Yugoslav wars in the 1990s have caused a large demographic shift. No census was held since 1991 and is not planned for the near future due to political disagreements. Since censuses are the only statistical, inclusive, and objective way to analyze demographics, almost all of the post-war data is simply an estimate. Most sources, however, estimate the population at roughly 4 million (representing a decrease of 350,000 since 1991).

According to the 1991 census, Bosnia and Herzegovina had a population of 4,354,911.

Tables 2 and 3 below present the provided data and main limitations for the analysis of the pension systems.

Table 2. Summary of Provided Data

File Name	Content	Data Limitations
FEDERATION (totals)		
Fbih data from pension fund.xls	<ul style="list-style-type: none"> ➤ New pensioners (all categories) 4,878. ➤ Stock of old-age pensioners 119,263; ➤ Stock of invalidity pensioners 65,128; ➤ Stock of survivors pensioners 108,957; ➤ Contributors 465,999 	<p>Not available: wages by age/sex, pensions by age/sex, and sex for new pensioners;</p> <p>Survivors are categorized according to the age/sex of the deceased insured⁹.</p>
FEDERATION (sample-individual rec.)		
Sarajevo ¹⁰	<ul style="list-style-type: none"> ➤ Stock of pensioners (invalidity, old-age, survivors). Provided 12,771 individual records (10,650 men, and 2,121 women); ➤ Stock of survivors, and children. Provided 5,119 individual records; ➤ Contributors. Provided 17,074 individual records. ➤ SA1.txt ➤ SA2.txt ➤ SarajevoAkt.txt 	<p>The sample of individual records only refers to data for 4 out of the 10 cantons (which is at the same time around 30 percent of all members of the Federation fund). Although it was mentioned this sample should be representative, a few differences have been observed in some distributions, when comparing with the totals.</p>
Mostar	<ul style="list-style-type: none"> ➤ Stock of pensioners (invalidity, old-age, survivors). Provided 74,065 individual records; ➤ Stock of survivors, and children. Provided 26,973 individual records; ➤ Contributors. Provided 114,861 individual records ➤ Stock of survivors. Provided 5,795 	<p>In the case of contributors, not all the individual records had information on wages, which means that the sample used for wage distribution by age/sex represents even less than 30 percent of all members</p> <p>Survivors are categorized according to the age/sex of the deceased insured. Real ages of the survivors had to be estimated.</p>
		Only information on age and sex provided (no

⁹ Age/sex data for survivors was used by switching the sexes and making the assumption that women are 2 years younger than their dead husbands would have been

¹⁰ Data from Sarajevo canton included three files (MO1, MO2, and Mostar AKT) that belong to the Canton Mostar but used to be covered out of the Fund based in Sarajevo before the merging of the systems. We were assured that there is no double counting.

<ul style="list-style-type: none"> ➤ I/4 Lanovi obitelji u HNZupaniji ➤ Plaae u HNZupaniji ➤ Mirovine u NHZupniji 	<ul style="list-style-type: none"> ➤ individual records (618 men, and 5,177 women); ➤ Stock of pensioners (invalidity, old-age, survivors). Provided 16,761 individual records; ➤ Contributors. Provided 18,659 individual records 	<p>Survivors are also here categorized according to the age/sex of the deceased insured. Real ages of the survivors had to be estimated.</p>
Canton 2	<ul style="list-style-type: none"> ➤ Contributors. Provided 520 individual records; ➤ Stock of pensioners. Provided 2,149 individual records (old-age, invalidity, and survivors); ➤ Stock of survivors. Provided 920 individual records 	<p>Unusually this dataset presents a number of beneficiaries much higher than the number of contributors.</p> <p>Survivors are also here categorized according to the age/sex of the deceased insured. Real ages of the survivors had to be estimated.</p>
Canton 5	<ul style="list-style-type: none"> ➤ Contributors. Provided 4,675 individual records; ➤ Stock of pensioners. Provided 4,581 individual records; ➤ Stock of survivors. Provided 1,915 individual records 	<p>Survivors are also here categorized according to the age/sex of the deceased insured. Real ages of the survivors had to be estimated.</p>
REPUBLIC OF SRPSKA (total)	<p>Number of contributors and average length of service by age/ sex and two categories (plus total): employees, and self-employed. Total number is 294,094 (173,740 males, and 120,304 females)</p>	<p>Not available: wages by age/sex,</p>
Rs insured from Pio	<p>Number of total pensioners (76,606 total, 56,930 males, and 22,676 females); 61, 865 survivors; and 32, 313 invalidity pensioners (22,317 males, and 9996 females).</p> <p>Pensions distribution for all categories</p> <p>New retirees by age/sex (old-age, invalidity, survivors), 1995-2004</p>	<p>Not available pensions by age/sex, and average length of service at retirement</p>
Listing osiguranika.txt	Individual records of 208,174 contributors	Total number of contributors provided in the

		previous dataset for RS was 294,000, not 208,174 as this time
Pregled broja korisnika porodicne penicije 2	The file of pensioners for RS only has number of people (that we already had), but does not include pension payments.	
kor_vp12_kor.xls	Number of pensioners, individual records (104,936), with information on age, sex, pension, and type of pension (1, invalidity, or 2, old age).	
Kor_vp3_kor.xls	This file contains pensioners, individual records (62,679), with information on age, pension, and all refer to family pensions (survivors).	No sex specific
FEDERATION and REPUBLIC SRPSKA		
Rs and fbih population	<i>RS population (end 2003)</i> , Source: RS Statistical Office. by age / sex <i>Fbih population by age/ sex</i> . From Statistical Office Dec. 2003	

Following the previous table which shows the provided data, Table 3 below presents the required data for the analysis of the pension systems, which part and how the provided data was used, and which assumptions were considered in the case of data unavailability.

Table 3. Data Availability

Required Data	Republika Srpska	Federation
Total pension payments separately for male / female invalidity pensioners	Estimated from a provided table of beneficiaries (old-age, survivors, and invalidity) by pension amount	Estimated average invalidity pension for men and women from the sample, and multiplied by the total number of invalids (men / women)
Total pension payments to survivors	Estimated from a provided table of beneficiaries (old-age, survivors, and invalidity) by pension amount	Estimated average survivorship pension from the sample, and multiplied by the total number of survivors
Income distribution (distribution of contributors by income bracket)	Calculated from the provided individual records of contributors	Estimated from the sample of all wages (individual records from 4 cantons)
Pensions distribution (distribution of old-age pensioners by pension bracket)	Yes, provided	Yes, provided
Average wages by age and sex	Calculated from the provided individual records of contributors	Estimated from the sample of contributors, individual records from 4 cantons
Average old-age pensions by age and sex	Yes, calculated from the total number of individual records with information on age, sex, and pension	Estimated from the sample of old-age pensioners, individual records from 4 cantons
Average invalidity pensions by age and sex	Yes, calculated from the total number of individual records with information on age, sex, and pension	Estimated from the sample of invalidity pensioners, individual records from 4 cantons
Number of current contributors by age and sex	Yes, provided	Yes, provided
Number of current old-age pensioners by age and sex	Yes, provided	Yes, provided
Number of current invalidity	Yes, provided	Yes, provided

pensioners by age and sex		
Number of current survivors and orphans pensioners by age and sex	Yes, provided	Yes, provided
Length of service at retirement of new old-age pensioners by age and sex	No, assumed to be the same as in Federation system	Yes, provided (although this was provided for all beneficiaries, old-age pensioners were assumed based on the age of retirement)
Benefit formula for new old-age pensioners	For 20 years, men get 45%, women 55%. For those retiring in 2000, additional years give 1.9% for male, 1.87% for female; in 2001, 1.8% and 1.73%; in 2002, 1.7% and 1.6%; in 2003, 1.6 and 1.46%; and in 2004 and beyond, 1.5% and 1.33% for women. Maximums are also being phased in, with 2004 and beyond set at 75% ¹¹	Replacement rate of 45% for 20 years plus 2% for each additional year up to max of 85% ¹²
Average replacement rate by age and sex for new invalidity pensioners	Estimated, and considered to be flat for all ages (lower for females)	Estimated, and considered to be flat for all ages (lower for females)

Data used for the analysis

FEDERATION

In the case of the Federation, the provided sample data seems quite representative, except for a few variations that are highlighted in the next paragraphs.

The following three indicators: wage distribution by age and sex, old-age pension distribution by age and sex, and invalidity pension by age and sex, were obtained from the sample data.

¹¹ The ruling from the Federation (footnote 5) applies equally to RS, but its implementation has been markedly different. In RS people are awarded base pensions based on their years of service and income levels, and these base pensions are indexed to nominal wage growth. The base pensions plus cumulated indexations are summed to get the nominal pension expenditures. These are then divided by the available revenue, including the budget transfers, to get the coefficient, which is then applied to each base pension plus accumulated indexation.

¹² The application of coefficients has also been considered. This coefficient requires contribution revenue to be equal more or less to pension expenditures through the use of it which is multiplied by the individual base pensions in order to equalize revenues and contributions. However, the rule is not strictly applied, to avoid reducing benefits to pensioners from month to month as revenues vary, and a small surplus has accumulated.

Contributors

The total number of contributors of the Federation pension fund in 2003 (according to original data provided) was 465,999. These data did not include wages by age and sex, and consequently this distribution was taken from the sample of contributors (individual records) from different 4 cantons. As indicated in table 2, data from 4 cantons: Sarajevo, Mostar, Canton 2, and Canton 5 were provided.

The total number of individual records contributors, including information on age, sex, wage, and number of hours worked, were:

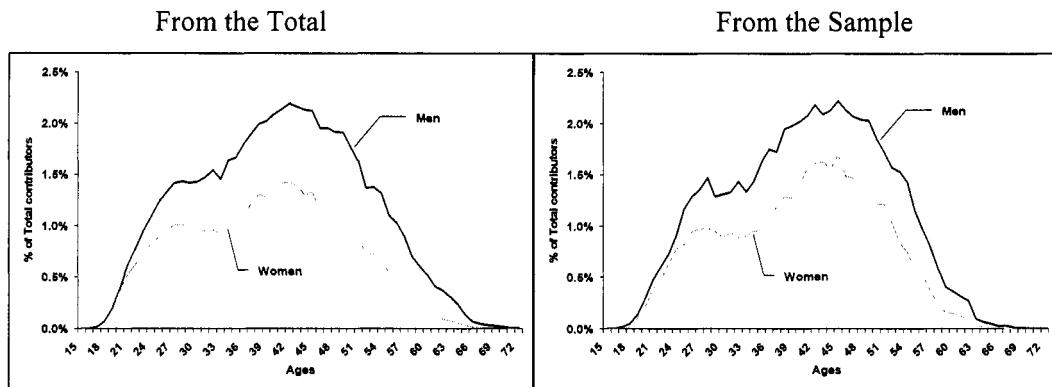
- 114,861 in Sarajevo (plus 17,074 from Mostar but still in Sarajevo database);
- 18,659 in Mostar;
- 520 in Canton 2; and
- 4,675 in Canton 5

This sample represented a total of around 33 percent of all contributors in the Federation system. However, not all the individual records had information on wages and at the end less than 30 percent of the total number of contributors in the Federation was actually possible to be considered for such distribution of wages by age and sex.

As indicated in figures below, the distribution of contributors by age and sex from the original table is very similar to the distribution of contributors from the sample (as indicated in figures below). This gives us more confidence to believe that the sample is quite representative, and consequently the wages distribution by age and sex (that was not originally provided) can be abstracted from the sample.

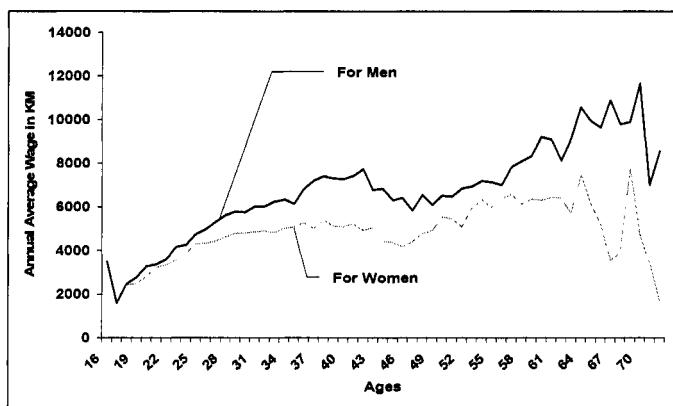
In both, totals and sample, the number of women represents 40 percent of all contributors. In the data provided as total contributors, 50 percent are younger than 40 years old. While looking at the sample this percentage is lower than 50 percent (in Sarajevo, for instance, 46 percent of contributors are younger than 40 years old, and in Mostar only 42 percent). In Cantons 2 and 5 people younger than 40 years also represents slightly less than 50 percent. This might indicate that in the rest of the cantons the number of younger contributors might be higher. However, this sample can still be quite representative (as illustrated in Figures 1a, and 1b, the distribution by age and sex of the contributors is very similar).

Figure 1a and 1b. Distribution of contributors by age and sex



According to the provided information on wages and contributors from Sarajevo, Mostar, Canto 2, and Canton 5, Figure 2 below illustrates the wage distribution by age and sex.

Figure 2. Distribution of wages by age and sex



Pensioners

Old-age Pensioners

The total number of old-age pensioners in the Federation pension fund in 2003 (according to original data provided) was 119,263. These data indicate that, while women represented 40 percent of all contributors, only around 27 percent of old-age pensioners are women. This might be an indication of the increase of the number of women in the labor market.

As illustrated in Figure 3, the distribution of old-age pensioners by age and sex of the total number of old-age pensioners is very similar to the number of old-age pensioners of the sample (old-age pensioners from Sarajevo, Mostar, Canton 2, and Canton 5). However, in this sample, the percentage of old-age pensioners who are women is 35 percent (unlike 27 percent indicated earlier), which might indicate that these cantons might have a higher percentage of women in the labor market when comparing with other cantons in the Federation. When comparing the sample with the total, it is also interesting to observe that in

the total 30 percent of the old-age pensioners are younger than 65 years old, while according to the sample only 24 percent are younger than 65, which might indicate that the

Figure 3a and 3b. Distribution of old age pensioners by age and sex

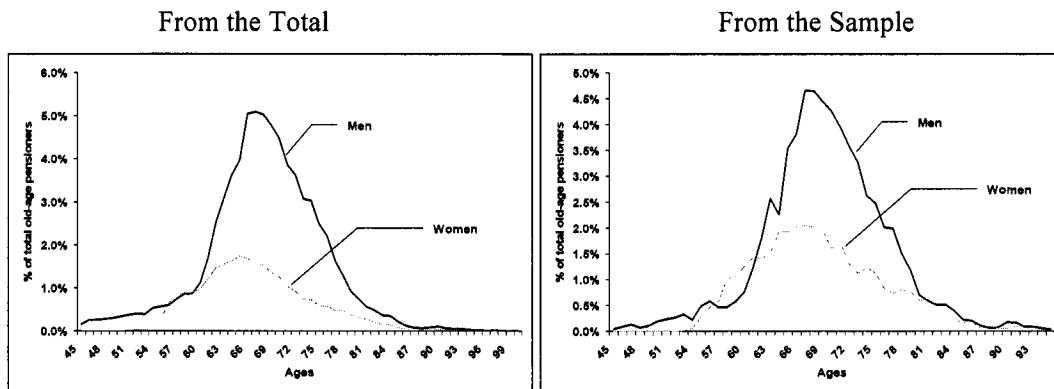
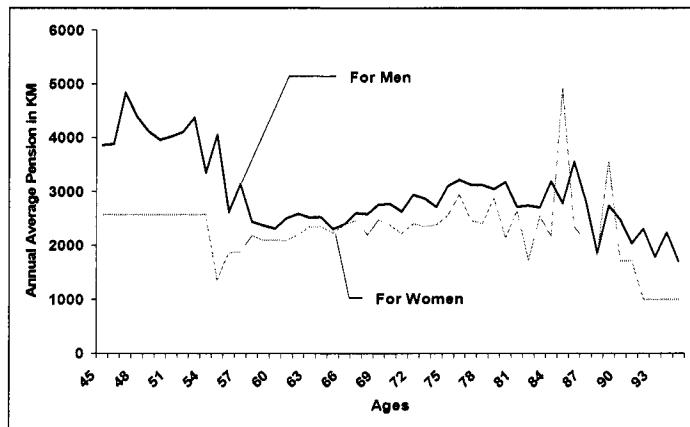


Figure 4. Distribution of old-age pensions by age and sex

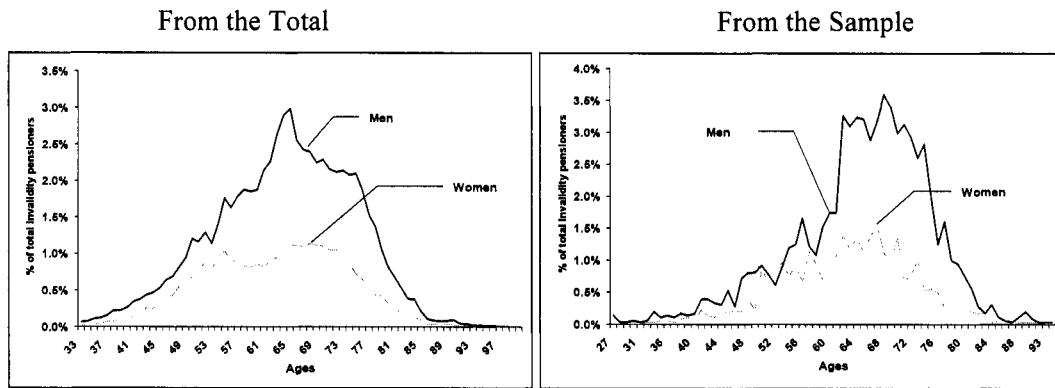


The distribution of average pension by age and sex is quite irregular, are relatively flat (being although old-age pensions for men relatively higher than old-age pensions for women).

Invalidity Pensioners

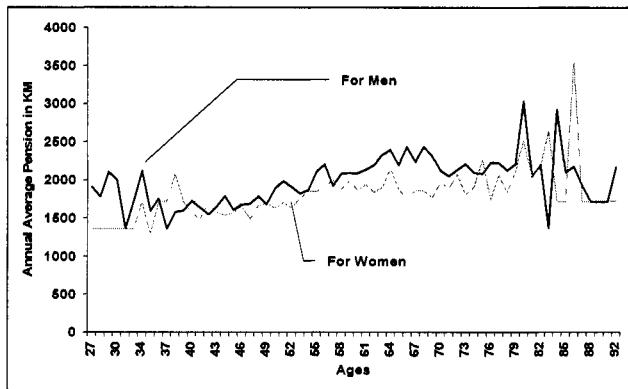
The total number of invalidity pensioners in the Federation pension fund in 2003 (according to original data provided) was 65,128.

Figure 5a and 5b. Distribution of invalidity pensioners by age and sex



In both distributions (from the total, and from the sample) the percentage of invalids younger than 65 years old represent 50 percent of all invalids. Women represent 31 percent of all invalids according to the total, and 29 percent according to the sample.

Figure 6. Distribution of invalidity pensions by age and sex



The average invalidity pension by age and sex is illustrated in Figure 6. According to the sample of invalidity pensioners, the average invalidity pension by age is relatively flat.

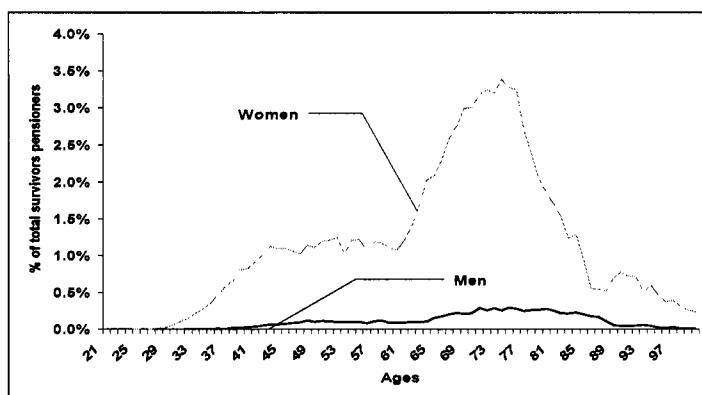
Survivorship Pensioners

Data provided on survivorship pensioners do not indicate the age of the survivor (widow, widower), but the age of the deceased member (spouse).

Survivors' ages (widows / widowers) were assumed to be two years less than the deceased spouse (except for the eldest which have been assumed to be 10 or 15 years younger¹³). Figure 7 shows the age and sex distribution of survivors assumed in the analysis of the Federation fund. In both sample of survivors and total amount of survivors it is shown that more than 90 percent of survivors are women.

¹³ In both, sample of survivors, and total of survivors, the eldest ages are 138

Figure 7. Distribution of Survivors Pensioners by Age and Sex



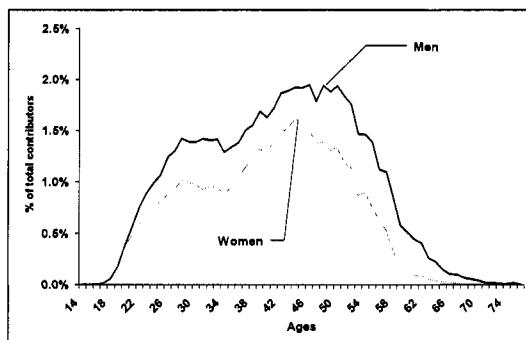
REPUBLIKA SRPSKA

Contributors

According to the original data provided for RS, the total number of contributors in 2003 was 294,094 (173,740 males, and 120,304 females). The individual records provided a few months later, contain a total of 325,000 members, however only 84,252 women, and 124,122 men have information on wages. Hence, wage distribution by age and sex was based on this total number of 208,174 contributors. When looking at the age and sex distributions of contributors both datasets (totals, and individual records) are very similar if not almost exact (as shown in figure 8 below).

Figure 8a and 8b. Distribution of Contributors by Age and Sex

From the Total



From Individual Records

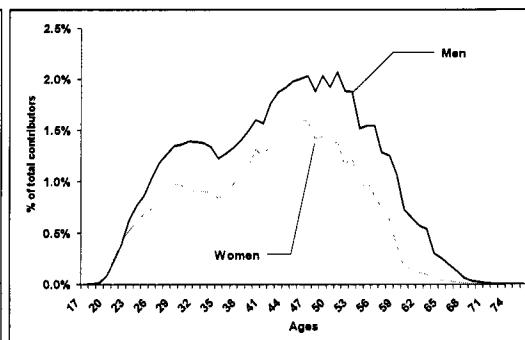
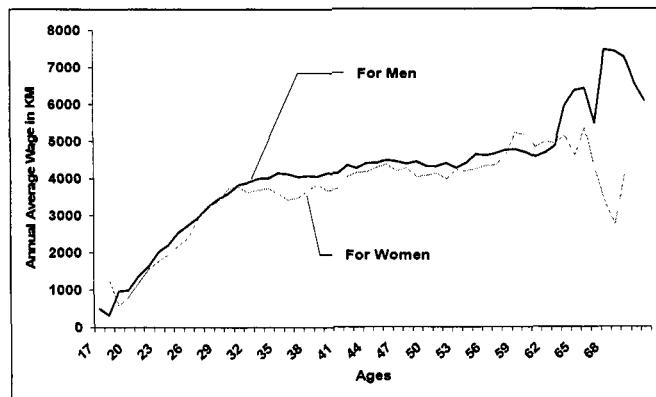


Figure 9. Distribution of Wages by Age and Sex



Pensioners

Individual records on pensioners were not provided for the Republic of Srpska. However, total numbers by age and sex were provided and figures below illustrate such distributions.

The pension payments distribution by age and sex is not available, and we are assuming a flat distribution.

Figure 10. Distribution of Old-age Pensioners by Age and Sex

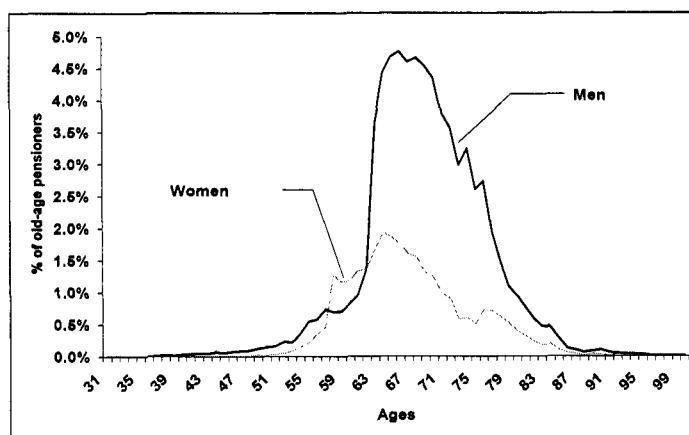
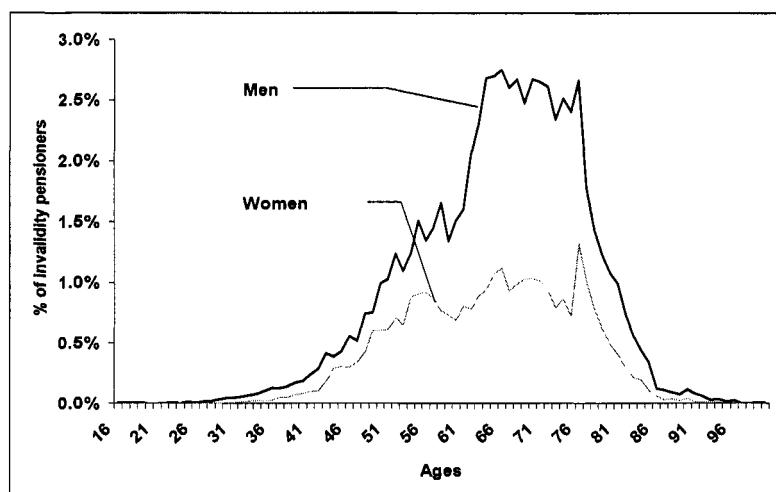
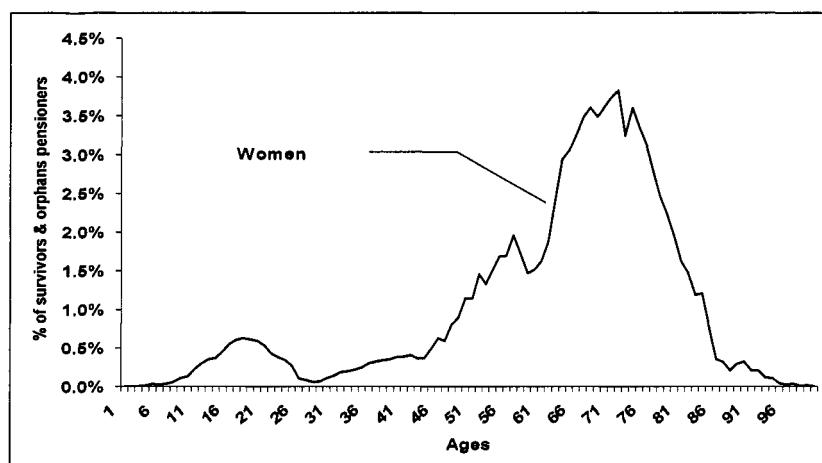


Figure 11. Distribution of Invalidity Pensioners by Age and Sex



The break-down of survivors pensioners by sex (and widows/orphans) is not available. All survivor pensioners have been considered together and distributed as indicated in figure 12.

Figure 12. Distribution of Survivors and Orphans Pensioners by Age and Sex



SECTION II. METHODOLOGY AND ASSUMPTIONS

Pension Reform Option Simulation Toolkit (PROST -Version 12) is a generic PC-based projection model developed by the Social Protection Unit of the World Bank. This model has been used to analyze the financial situation of the BH pension systems.

The program is designed to simulate the behavior of pension systems and can assess their financial sustainability under different sets of assumptions over a long time frame. It allows modeling different pension reform options – from “parametric” reforms of pay-as-you-go defined-benefit schemes to systemic reforms, such as the introduction of fully funded defined-contribution and/or notional defined-contribution schemes. The program can be adapted to a wide range of country circumstances and can handle simulations up to 100 years and more.

As with any simulation model, the outcome from PROST depends largely on the nature and quality of data as well as on the set of assumptions being used for the simulations. Since PROST has been used in some 80 countries to provide quantitative input for pension policy discussions, its methodology has proven to be sufficiently robust and its flexibility has permitted easy adaptation to specific country circumstances for sensitivity testing and comparisons under a wide range of economic and policy scenarios.

However, it is always important to keep in mind that projections of this nature should not be quoted in absolute terms without proper reference to the underlying assumptions. The purpose of the sustainability benchmarks presented here is to provide a comparison of the relative magnitude of the effects of different pension policy measures under various scenarios.

The start of the simulation horizon was 2003 (base year), the year for which the most complete documentation was found for all of the variables needed for PROST. The ending year for the simulation horizon was 2075 (end year), a period viewed to be of adequate duration to demonstrate the emerging trends of pension expenditures in most pension schemes.

PROST basically follows single age/gender cohorts over time and generates population projections, which, combined with labor market assumptions, are used to forecast future numbers of contributors and beneficiaries. These in turn generate flows of revenues and expenditures. The model then projects fiscal balances.

General Country Demographic Assumptions¹⁴

All data and assumptions required by PROST for population projections were provided by the World Bank’s Population Unit: initial population by age and gender; and, projections of age-specific fertility rates, mortality rates, and migration flows. However, the initial

¹⁴ As mentioned in previous section, no census has been produced since 1991, hence careful consideration should be given to population data.

population rates by age and gender, plus initial fertility rates were obtained from the Statistical Bulletin of Bosnia and Herzegovina, 2003.

Mortality Rates: Age-specific mortality rates (in five-year age groups), including projected improvements in mortality (in five-year intervals), for the years 2003-2075 were provided by the World Bank's Population Unit. These mortality rates were used to calculate the probability of dying by age cohort (age 0-85) for both men and women every year during the simulation horizon. As a result of the mortality assumptions, the average life expectancies at various ages are shown in Table 4 below.¹⁵

Table 4: Projection of Life Expectancy Changes

	2003	2004	2005	2006	2010	2025	2050	2075
Male								
<i>Life Expectancy</i>								
At birth	70.9	71.0	71.2	71.3	71.9	73.7	76.7	80.1
At age 20	52.7	52.8	52.9	53.0	53.5	54.9	57.6	60.6
At age 60	17.2	17.2	17.3	17.4	17.7	18.8	20.9	23.3
At age 65	13.7	13.8	13.9	13.9	14.2	15.1	17.0	19.1
Female								
<i>Life Expectancy</i>								
At birth	76.8	77.1	77.4	77.7	78.9	81.3	83.7	86.1
At age 20	58.1	58.3	58.6	58.8	59.9	62.2	64.3	66.5
At age 60	20.8	21.0	21.2	21.4	22.3	24.1	25.8	27.6
At age 65	16.8	17.0	17.2	17.4	18.1	19.8	21.3	23.0

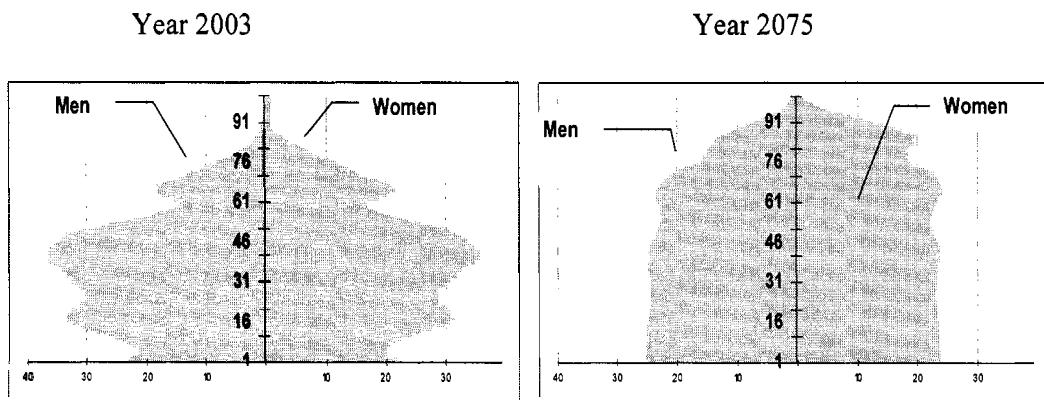
Note: Average remaining years of life expected at specific ages.

Source: World Bank staff calculations based on PROST.

Population pyramids for Bosnia and Herzegovina give a quick graphical summary of changing demographics. In 2003, elderly population is relatively low. Note also the bulges in the pyramid showing baby 'booms' and 'busts'. By 2075, we expect the 'pyramid' to be less steep, with many more elderly.

¹⁵ Mortality tables used are available upon request.

Figure 13. Population Pyramids for Bosnia and Herzegovina



General Economic Input Data and Assumptions

Macroeconomic assumptions: The economic indicators (GDP growth and inflation rate) used for years 2003-2005 were based on the IMF and Economist Intelligent Unit data and projections. After consulting with the country economist for BH at the WB, it has been assumed a 5.3 percent GDP growth over the next 15 years, and a slight growth decrease in 2021 to 5 percent by 2030 and until the end of the simulation period, considering that the country is still poor.

The inflation rate was assumed to be 3 percent in the long term, but 2.5 percent in 2005, 5.5 percent in 2006, and 2.5 percent in 2007.

Real discount rate was assumed to be the same level as real GDP growth.

Average wages in both entities have risen steadily for the last several years. More recently, the average wage in the RS grew more rapidly than in the Federation, narrowing the gap in wage levels that has been in place since the end of the war. This trend continued in the first half of 2005, as the Federation net wage rose by 3.4 percent year on year in January-June (according to EIU, April 2006), compared with a 10.5 percent increase in the RS over the same period. In the medium and long run, insured wage bill as percentage of GDP is assumed to be constant.

These economic parameters were used in conjunction with the assumptions concerning the population and the system demographics (see section I) to project the future financial conditions of the pension systems (see section III). Table 5 below summarizes the key macroeconomic assumptions assumed.

Table 5: Key Macroeconomic Assumptions (percent per year)

Macroeconomic Trends	2003	2004	2005	2020	2040	2050	2075
Real GDP growth	4.0	5.7	5.3	5.3	5.0	5.0	5.0
Real wage growth							
Federation	5.0	4.0	3.4	4.5	6.0	6.0	4.0
Republic S.	10.0	10.0	10.5	6.0	5.5	5.0	5.0
Inflation rate	1.4	0.8	2.5	3.5	3.0	3.0	3.0
Real discount rate	4.0	5.7	5.3	5.3	5.0	5.0	5.0

Source: PROST input files for BH (Federation and Rep. S.)

Contributors and Beneficiaries of Federation and Republic of Srpska

The number of contributors and beneficiaries for both systems, Federation and RS, were computed as a “Stock” method. With such method, it has been assumed no expansion of coverage. The percentage of contributors in each age / sex is constant during the entire simulation period. For each year the stocks of contributors/beneficiaries are calculated first and then inflows (new contributors / beneficiaries) are derived as the changes of the stocks:

$$Inflow(a,t,g) = stock(a,t,g) - stock(a-1,t-1,g) + outflow(a,t,g)$$

As PROST keeps track of contribution years of service accrued by each cohort, the calculated number of new retirees is then adjusted so that the total length of service accrued by the cohort is equal to the total length of service claimed by the cohort at the time of retirement.

While it has been assumed that there is no coverage expansion, the number of disabled, and survivors have been assumed to be gradually decreasing until the end of the simulation period.¹⁶

Under these assumptions, in the next section the evolution (projections) of contributors and beneficiaries during the simulation period in both systems are presented.

Finances of Federation and Republic of Srpska Systems

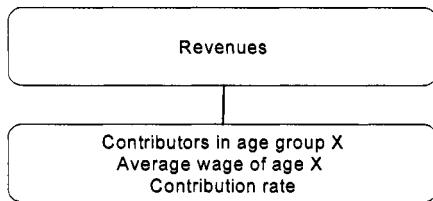
Revenues

The following chart shows a schematic view on the calculation and sources of revenues. Contribution revenues were calculated based on the prescribed contribution rate, the average earnings of each age cohort, and the number of contributors in each cohort. The Federation program has been financed through a contribution rate of 34 percent of gross wages. Collection rate is assumed to be 88 percent in both funds.¹⁷

¹⁶ In the Federation, the number of disabled as percentage of population by age / sex has been assumed to gradually decrease 25 percent by the end of the simulation period, while number of survivors decrease 75 percent. In RS, the same respective assumed percentages were 50 percent and 25 percent.

¹⁷ Compliance rates averaged around 80 percent for private-sector employer groups in most countries.

Figure 14: Calculation of Revenues



Expenditures

The way PROST calculates expenditures is through benefits for the stock of old-age pensioners in each year, based on the pension of the previous year, indexation rules, and entry benefits for new retirees.

Survivorship benefits also are derived from the benefits of the previous year, indexation rules, and new benefits (stock benefits are modeled directly as replacement rates – average pension as percentage of average wage).

Wage projections are very important both for the revenue and expenditure sides of system finances: they form the base for contribution and pension calculations. The data on the income distribution of the current contributors were provided for the two different programs. The average covered wage by age and gender was illustrated in section I.

Changes in the average wage of the insured population were determined by labor productivity growth as well as changes in the age distribution of wages and age composition of the stock of contributors. The initial age distribution of contributors' wages is assumed to remain the same throughout the simulation period. As the contributor population ages, average wages were seen to grow faster than labor productivity due to an increase in the respective earnings profile.

In the case of the *Federation*, the system is running a small surplus thanks to a ruling from the Office of the High Representative of the International Community in BH which requires contribution revenue to be equal more or less to pension expenditures through the use of a coefficient which is multiplied by the individual base pensions in order to equalize revenues and contributions. However, the rule is not strictly applied, to avoid reducing benefits to pensioners from month to month as revenues vary, and a small surplus has accumulated.

The assumed coefficients of the simulation period equalize revenues and contributions every year during the entire simulation period.

According to the law, if pension resources do not equal to expenditures, which include administrative expenditures and pensions, those will be recalculated by multiplying the pension level for that month by the coefficient.

The implementation of the OHR ruling in the Federation also leads to some perverse redistributive outcomes. Individual pensions are recorded in the amounts awarded at the time of initial retirement with no adjustment for inflation whatsoever. These base pensions are

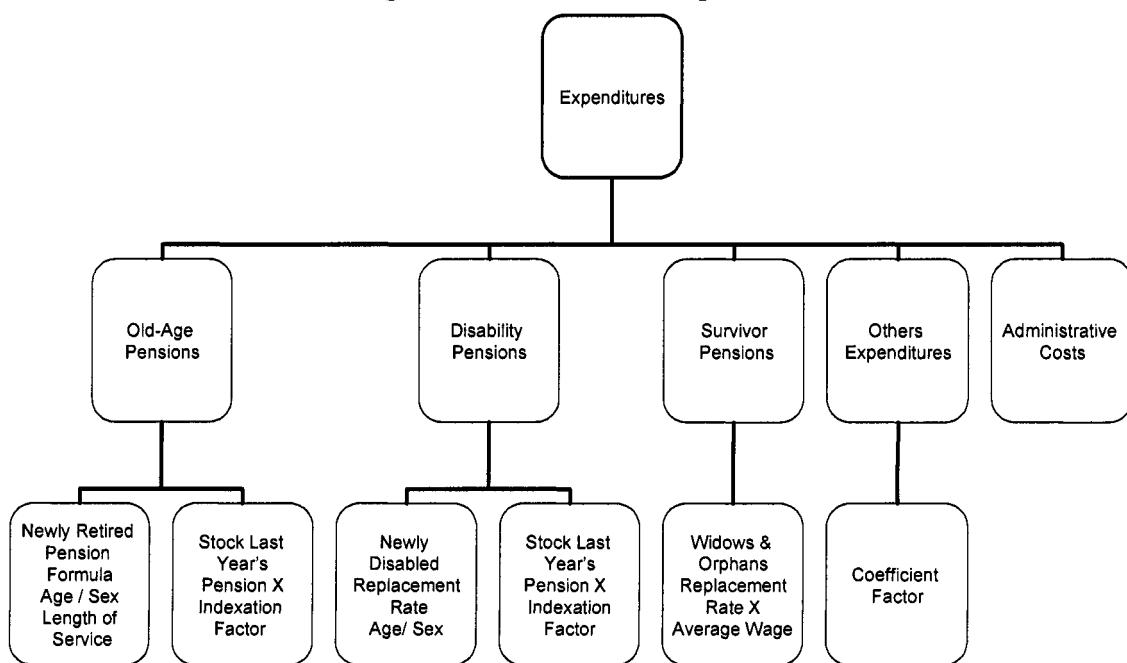
summed together, and the revenues are divided by the sum of these base pensions to determine the coefficient. This coefficient thus determined is then multiplied by the base pension to calculate the actual pension paid. For example, the coefficient currently stands at 1.18. Thus, all pensions are paid at 118 percent of the value of the base pension. A person who is currently 90 years old and was awarded a base pension 30 years ago receives the same 18 percent increase as a person who was awarded a base pension only in 2005.

In the case of *Republic Srpska*, people are awarded base pensions based on their years of service and income levels, and these base pensions are indexed to nominal wage growth. The base pensions plus cumulated indexations are summed to get the nominal pension expenditures. These are then divided by the available revenue, including the budget transfers, to get the coefficient, which is then applied to each base pension plus accumulated indexation. As a result, pensions are more equitable in RS than in the Federation, with the oldest pensioners not receiving appreciably less than younger pensioners. The coefficients are much lower in RS than in the Federation, around 0.85 in 2003, having risen to 0.94 by November 2005, largely due to political pressure to reach 1. It reached 1 by January 2006, and this is the assumed coefficient during the entire simulation period.

Administrative costs are assumed to be 4.5 percent of revenues from contributions, during the entire simulation period.

Figure 15 below illustrates how PROST calculates expenditures.

Figure 15: Calculation of expenditure¹⁸



¹⁸ Pension indexation is only applied in the case of the RS system. Assumed coefficients are different in RS and the Federation as explained in text.

SECTION III. PRELIMINARY PROJECTIONS. DEMOGRAPHICS AND FINANCES

Demographic projections

Considering the assumptions described in the previous section, table 6 below presents the evolution of contributors and beneficiaries.

The systems demographics (in both programs) are unfavorable to their finances. Under the assumption of no coverage expansion, the tendencies are very similar in both funds. According to the provided data, in the Federation there are currently less than 2 contributors for each beneficiary. Under such assumption of no coverage expansion, by the year 2020 there will be only 1 contributor for each beneficiary, and this ratio will even get worse, being more beneficiaries than contributors until around 2050. By that year the ratio will slightly improve and there will be more than 1 contributor for each beneficiary by the end of the simulation period, but in any case never more than 2.

In RS the situation is very similar, there are less than 2 contributors for each beneficiary. The ratios are slightly better than in the Federation, however in long term the demographics in the Federation system improve relatively faster. In RS by 2037 there will be more beneficiaries than contributors that will be the case until almost the end of the simulation period.

Table 6: Evolution of Contributors and Beneficiaries (in thousands)

FEDERATION	2003	2004	2005	2010	2020	2030	2040	2050	2075
Total Contributors	466.0	470.7	474.9	494.2	497.7	462.5	419.0	382.9	369.4
Male	290.4	293.6	296.5	310.1	313.3	292.7	265.2	241.5	232.6
Female	175.6	177.1	178.4	184.1	184.4	169.8	153.9	141.3	136.9
Old Age	119.3	126.8	132.9	146.8	157.1	172.2	181.9	180.8	146.3
Male	87.1	92.7	97.2	106.4	114.1	119.2	118.6	109.5	78.6
Female	32.2	34.2	35.8	40.4	43.0	53.0	63.3	71.3	67.7
Disabled	65.1	68.8	71.7	82.8	95.5	99.3	101.9	97.1	69.5
Male	44.6	47.1	49.1	56.2	64.3	66.4	68.7	66.1	47.9
Female	20.5	21.7	22.6	26.6	31.2	32.9	33.2	31.1	21.6
Survivors	104.2	109.1	114.0	137.5	166.2	168.0	176.2	171.7	121.1
Total Beneficiaries	288.6	304.6	318.6	367.1	418.7	439.4	459.8	449.7	336.9
System Dependency	61.9%	64.7%	67.1%	74.3%	84.1%	95.0%	109.7%	117.4%	91.2%

REP. SPRSKA	2003	2004	2005	2010	2020	2030	2040	2050	2075
Total Contributors	294.0	297.5	301.2	313.6	314.1	292.9	265.8	240.9	232.5
Male	173.7	176.0	178.3	186.8	189.4	178.1	162.6	147.4	141.2
Female	120.3	121.6	122.9	126.9	124.7	114.8	103.2	93.5	91.4
Old Age	79.5	85.4	88.2	101.5	120.1	131.2	140.3	140.5	112.8
Male	56.9	61.0	62.9	70.9	78.8	81.1	80.9	74.0	49.8
Female	22.7	24.4	25.3	30.6	41.3	50.1	59.4	66.5	62.9
Disabled	32.3	34.7	37.0	45.1	54.5	57.6	60.8	59.4	44.1
Male	22.3	23.8	25.4	30.5	35.9	37.5	39.6	38.8	28.9
Female	10.0	10.9	11.7	14.6	18.5	20.1	21.2	20.7	15.2
Survivors&Orphans	61.8	64.5	67.0	77.6	88.0	88.0	90.3	84.8	55.7
Total Beneficiaries	173.7	184.6	192.3	224.2	262.5	276.7	291.4	284.7	212.5
System Dependency	59.1%	62.0%	63.8%	71.5%	83.6%	94.5%	109.6%	118.2%	91.4%

Projections of revenues and expenditures

In the Federation, the danger to the pension system in its current form is not fiscal since the self-balancing mechanism will reduce pensions to force some level of balance, but social. The level of pensions is expected to fall from the current average of 40 percent of wage for all types of pensions (old age, disability, and survivors) to a low of 25 percent in the next 30 years, based on preliminary results shown in Figure 17.

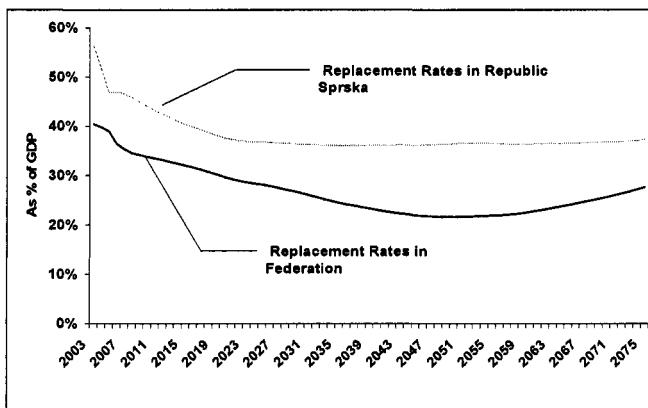
In the RS, replacement rates for all beneficiaries are around 56 percent of net wage. These are higher than in the Federation partly because, as earlier mentioned, of the way the OHR coefficient has been applied in RS. Also, the denominator (average wage) is lower in the RS. Results are presented in Figure 17.¹⁹.

The preliminary results shown in Figure 16 show a rapidly expanding deficit in the RS system, if the coefficient is maintained at 1.²⁰.

Figure 16. Current Balance of RS Pension Fund



Figure 17. Replacement Rates for all Beneficiaries in both Pension Funds



¹⁹ Please note average wage refers to each entity separately.

²⁰ GDP always refer to the State GDP of Bosnia-Herzogovina.

MAP SECTION

BOSNIA AND HERZEGOVINA

- SELECTED TOWNS
- ★ NATIONAL CAPITAL
-  MAIN RIVERS

— MAIN ROADS
— RAILROADS
····· DAYTON AGREEMENT LINES
— MUNICIPAL BOUNDARIES
— — INTERNATIONAL BOUNDARIES

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