

Fiscal Projections for Pension System of Belarus

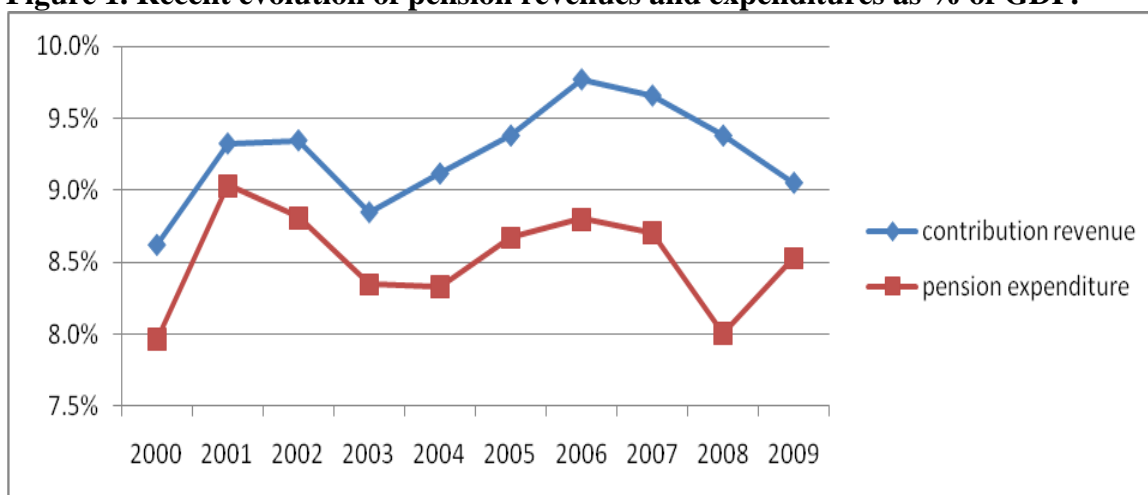
by Asta Zviniene and Sergiy Biletsky, ECSH3, the World Bank, May 2011

This note attempts to describe the pension system in Belarus including its fiscal performance, redistributive aspects, benefit levels and benefit eligibility conditions. The note also discusses the challenging demographic environment which Belarus pension system is expected to face in the future and explores alternative paths that the system could take in this environment. Some reform scenarios are explored including the increase in retirement ages, changes in benefit indexation rules and the introduction of notional defined contribution accounts.

Recent Fiscal Performance of the Pension System

The pension system of Belarus is a conventional single pillar PAYG scheme. Since 2009 contribution rate of 29% is charged¹ on the insured wage bill which is intended to cover all pension benefits including old age, disability and survivor insurance. In the recent past pension system finances have been relatively stable producing a small surplus of .5%-1% of GDP as shown in Figure 1. However, as discussed later in this note, the pension system is likely to face financing challenges going forward, mostly due to the strong demographic headwinds that are expected to intensify in the near future. Given that contribution rate of 29% is already quite high by regional standards, as shown in Figure 2, most of the needed adjustment will likely have to be made on the expenditure side.

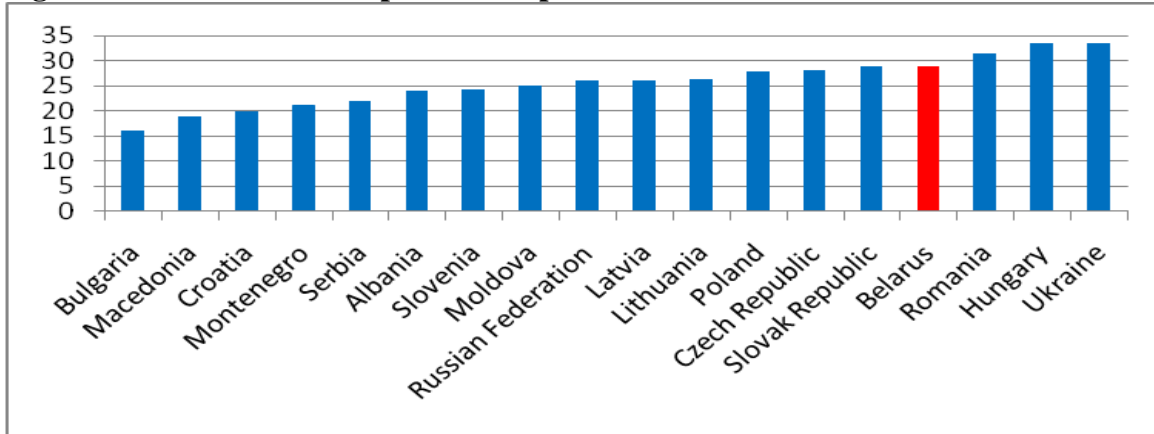
Figure 1. Recent evolution of pension revenues and expenditures as % of GDP.



Source: Government data

¹ Contribution rate dedicated to pensions has been 30% until 2009.

Figure 2. International comparisons of pension contribution rates.

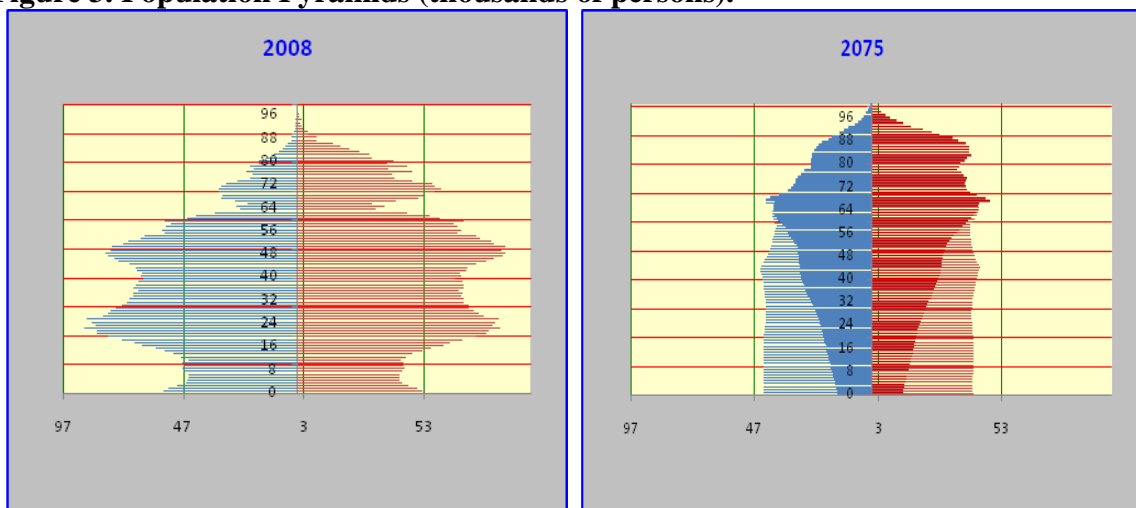


Source: WB database

Demographic and Macroeconomic Environment

One of the most influential factors for the future performance of the pension system is the demographic environment of the country which for Belarus is presented on the left hand side of the Figure 3². As can be seen from the graph, in recent years pension system has functioned in a very favorable demographic environment. Low rates of birth and survival for the cohorts born 1940 – 1946 has meant very low numbers of pensioners aged between 62 and 68 in the year 2008. However, the pressure on expenditures is starting to grow as post-war baby boom is translating into the yearly increase in the number of new retirees extending until the year 2020 when the size of the 60 year old cohort will be 40% higher than it was in 2008.

Figure 3. Population Pyramids (thousands of persons).



Source: Prost projections

² Data provided by the statistical agency of the Republic of Belarus.

Similarly, for 15 years prior to 2008 the size of each new 22 year old cohort has been larger than the last one, bringing increasingly higher numbers of new contributors to the pension plan. Unfortunately, this trend has also reversed in 2008. By the year 2020 the size of the 22 year old cohort will be merely half of its current size. This estimate ignores the effects of emigration which may compound the problem even further.

The right hand side graph in Figure 3 shows the projected shape of the population pyramid in the year 2075³. Mortality projections for the modeling period are taken from the World Bank's Population Database and are consistent with those used by UN and EU. According to these assumptions, life expectancy at the age 60 over the simulation period is expected to increase from 14 and 19 years to 23 and 28 for male and female respectively.

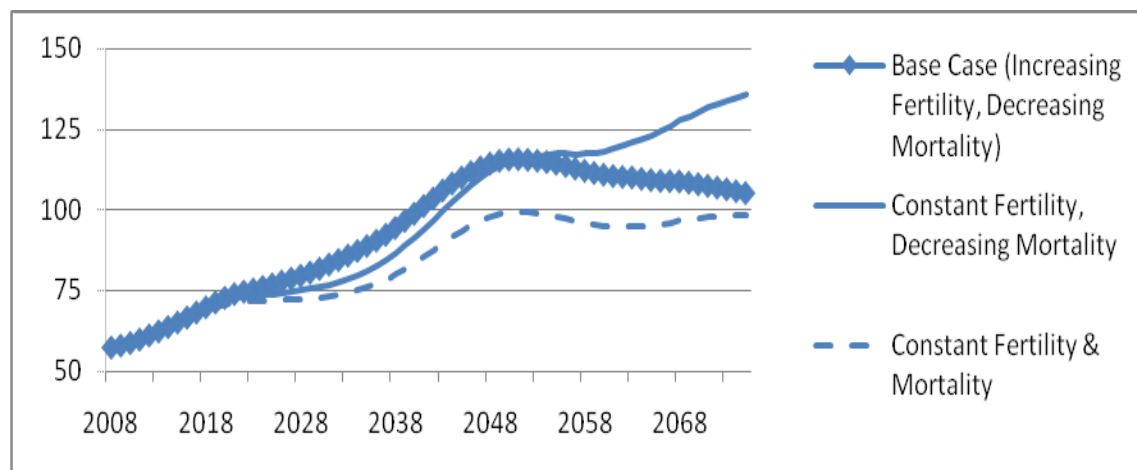
While the assumptions on mortality improvements are hard to make, some guidance can be derived from past experiences of other countries of similar background and similar stage of development. Making assumptions about future developments in fertility rates is even more challenging. The outer shape of the right hand side graph presents the situation where fertility rates gradually increase from 1.26 children per woman recently to the replacement rate of 2.06 children per woman by the end of the simulation horizon, which would eventually stabilize the size of the population of Belarus. The inner shape of the pyramid demonstrates how much the population of Belarus would contract if the fertility rates stay at the current level until the year 2075. Population migration is ignored in both scenarios.

The projections further developed in this note are based on the more optimistic scenario depicted by the outer shape of the population pyramid in Figure 3. Under this baseline scenario the overall population is projected to decline from the 9.7 million in 2008 to about 7.3 million by the end of the simulation period. At the same time the size of the population aged between 15 and retirement age of 55/60 is expected to decrease by 42% while the number of population above pension age is expected to increase by 19%.

The evolution of the projected population dependency ratio, which is the number of old age people for each 100 working age people, is depicted in Figure 4. For illustration purposes, the effect of the main assumptions on future changes in fertility and mortality rates are also presented. The figure clearly shows that the demographic environment for the pension system is going to worsen substantially for the next 40 years as dependency rate for the base case scenario doubles from 57 in 2008 to 115 in 2050. Interestingly, substantial worsening of the demographic situation is not overly dependent on the assumptions about future fertility and mortality, but is mostly dictated by the size of the age cohorts alive today. It is also clear that even successful policy of fertility rate increase can start relieving demographic pressures no earlier than in four decades.

³ All projections presented in this note were carried out using the World Bank's Pension Reform Options Simulation Toolkit (PROST).

Figure 4. Projected population dependency rate.



Source: PROST projections

The projections presented in this note use the latest IMF macroeconomic assumptions for the 2010-2015 period (see Table 1). Longer term assumptions allow for the gradual decrease in the real wage growth from 5% to 3.5% in the long term. However, even at this relatively optimistic wage growth rate, GDP growth would only reach 2%-3% due to the contraction in the size of the working age population⁴.

Table 1. Macroeconomic assumptions.

	2008	2009	2010	2011	2012	2013	2020	2030	2040	2075
Real GDP growth	10.0%	0.2%	2.4%	4.6%	5.3%	6.1%	3.5%	3.0%	2.0%	3.2%
Real wage growth	9.0%	-2.2%	0.7%	4.2%	7.4%	8.1%	4.7%	4.1%	3.6%	3.5%

Source: IMF database and staff assumptions

Evolution of the Number of Pension Plan Participants

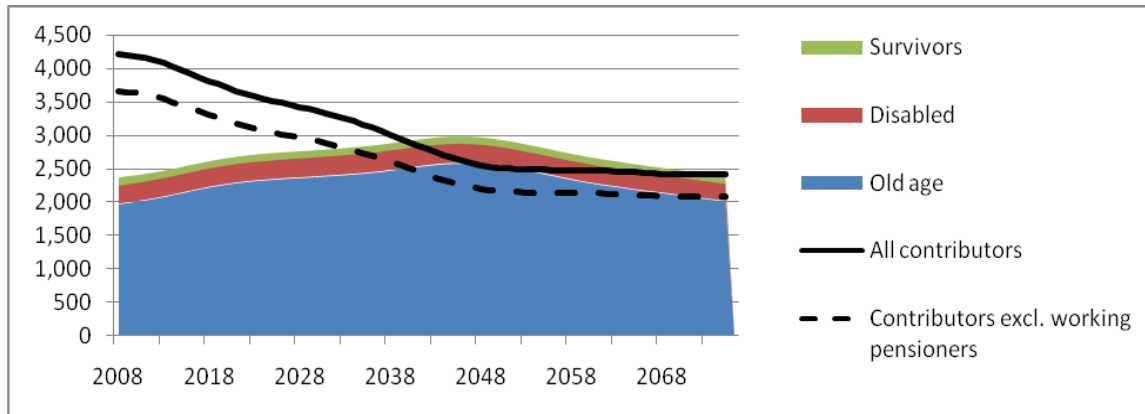
In 2008 around 3,600 thousand of individuals below retirement age paid contributions to the fund each month. In addition there were 560 thousand working (and contributing) pensioners and 1700 thousand fully retired individuals receiving work related pensions. The fund has also paid 126 thousand survivor pensions. Projected future evolution of pension fund membership is presented in Figure 5 and clearly shows dramatic increase in beneficiary to contributor ratio in the next 40 years.

The results in Figure 5 reflect an assumption that retirement ages of 55 and 60 for men and women respectively will continue to stay at current levels for the whole simulation horizon. However, given the difficult demographic situation and projected lengthening in life expectancy this is highly unlikely. Already around half of young pensioners are working as shown in Figure 6, demonstrating that even with current health status big

⁴ GDP growth rate is exogenous in this model as the ratio of wage bill to GDP is held constant.

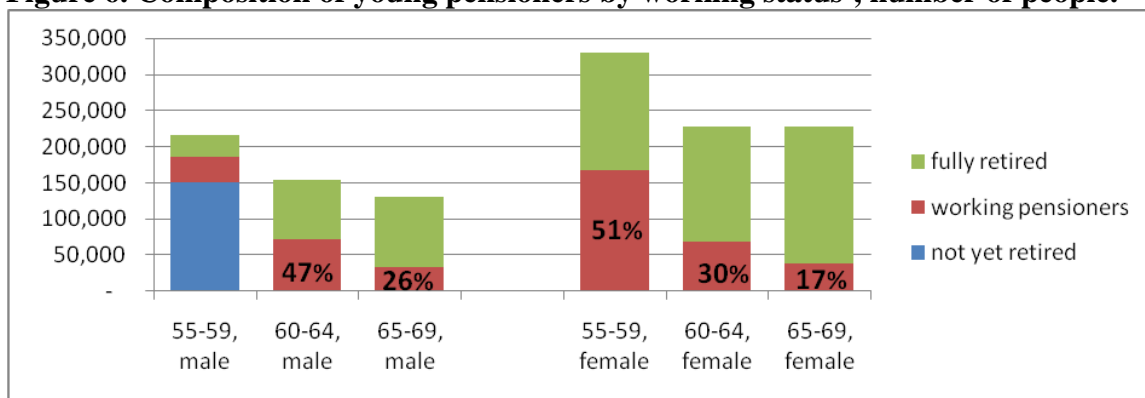
portion of the population currently eligible for retirement is able to work and is employable. Therefore, a rise in statutory retirement age is not only needed from the fiscal perspective and is also socially feasible.

Figure 5. Projected evolution of pension fund membership.



Source: PROST projections

Figure 6. Composition of young pensioners by working status⁵, number of people.



Source: Government data

Relatively wide-spread early retirement privileges are of even greater immediate concern, mostly on fairness and equity grounds. More than half a million of current retirees have retired with early retirement privileges representing 25% of the overall old age retiree pool. On average the benefits of these retirees are 58% higher than average pension demonstrating that these people are not representing to lowest income segment of the elderly population of Belarus. Retirees with early retirement privileges can be divided into four broad categories as specified in Table 2.

The first and most numerous group consists of people deemed to be employed under special (often hazardous) work conditions. The growth of the number of retirees in this group has averaged only 1% over the 2007-2010 period. However, the growth of the subset of these retirees formerly employed as public transport drivers, hardly especially

⁵ The numbers quoted in the graph include old age and disability pensioners.

Table 2. Early retirement programs in Belarus.

<u>Name of privileged category</u>	<u>Beneficiaries, 2010</u>	<u>Annual growth, 2007-2010</u>	<u>Average pension, 2010, th</u>	<u>Pension amount compared to average</u>	<u>Value of early ret. privilege per person, mln*</u>	<u>Years of retirement advancement</u>	<u>Program expenditure, 2010, bln</u>
Special work conditions	252,521	1%	652	145%			1,707
list 1	<u>61,533</u>	0%	652	145%	<u>78</u>	10	<u>417</u>
list 2	<u>129,846</u>	1%	643	143%	39	5	<u>859</u>
women, textile workers	8,431	3%	651	145%	39	5	56
tractor drivers	<u>24,323</u>	-2%	631	140%	38	5	<u>163</u>
women, farm workers	<u>17,267</u>	1%	653	145%	39	5	<u>117</u>
public transportation drivers	2,008	<u>9%</u>	659	147%	40	5	13
miners	8,776	-2%	857	<u>191%</u>	<u>154</u>	15	80
expedition workers	337	6%	640	142%	38	5	2
Preferential treatment	96,233	-3%	586	130%			622
war disabled	5,058	-16%	978	<u>218%</u>	59	5	67
mothers of military personnel	505	-1%	710	158%	0	0	4
mothers with at least 5 children	<u>52,411</u>	-5%	525	117%	31	5	<u>306</u>
parents of disabled children	<u>16,532</u>	<u>8%</u>	549	122%	0	0	<u>88</u>
dwarfs	36	-3%	573	128%	103	15	0
disabled since childhood	10,668	0%	630	140%	38	5	71
worked in Northern areas	7,462	-5%	736	164%			62
Chernobyl liquidators	1,610	<u>7%</u>	662	147%	<u>79</u>	10	10
disabled by Chernobyl	697	<u>11%</u>	640	142%	38	5	4
according to Employment Law	1,254	-17%	583	130%	14	2	9
Pensions for Years of Service	28,189	<u>11%</u>	742	165%			233
flight personnel	2,370	-1%	1,181	<u>263%</u>	<u>135</u>	9.5	36
some medical occupations	2,700	<u>16%</u>	594	132%	36	5	15
some teaching occupations	<u>12,242</u>	<u>13%</u>	595	132%	36	5	74
actors	195	-5%	530	118%	64	10	1
prosecutors	4	0%	778	173%			
sportsmen	100	5%	525	117%	31	5	1
civil servants	<u>10,578</u>	<u>11%</u>	1,024	<u>228%</u>	<u>61</u>	5	<u>106</u>
Military pensions	126,423	0%	912	203%			1,391
administered by SP authorities	8,629	-12%	568	126%		discontinued	66
other military pensions	<u>117,794</u>	0%	937	<u>209%</u>	<u>169</u>	15	<u>1,325</u>
TOTAL	503,366	0%	710	158%			3,953

*Value of early retirement privilege is calculated by multiplying average benefit by the number of years of retirement advancement

difficult or hazardous occupation, has grown 9% per year. Most retirees belonging to this broad category have a right to retire 5 years earlier, although people belonging to “list 1” category can retire up to 10 years and miners up to 15 years earlier. Such privileges are quite costly. For example, the total value of the early retirement privilege to a miner retiring 15 years earlier with the benefit that is on average almost twice as high as regular pension amounts to 154mln rubles per person. It is arguable if early retirement privileges are the best policy option to deal with hazardous work conditions. The money spent on this program might be better used to improve and monitor work conditions. At the minimum the awarding of such privileges should be based on statistically proven deterioration of employee health at the enterprises in question.

The second group that is offered “preferential treatment” in the form of early retirement comprises of people deemed disadvantaged in some way. This group includes war disabled, parents who raised many children or whose children were disabled, people who have helped in liquidating the effects of Chernobyl disaster and some other similar categories. While the number of beneficiaries in this group is slowly decreasing, the two groups that are growing rapidly are Chernobyl liquidators and parents of disabled children. Surprisingly, the average benefit for this group is 30% above average pension demonstrating that, at least in retirement, this group is not most disadvantaged financially. Also somewhat surprisingly the pensions of war disabled are more than twice as high compared to the average pension.

The third group of retirees with early retirement privileges consists of only 28 thousand people but has recently been growing very fast at 11% a year. This group consists of representatives of some occupations including teachers, some civil servants, some medical personnel, flight personnel, etc. The privileges to these groups are particularly hard to justify, as these occupations are not difficult, hazardous or disadvantaged. The average benefit to this group stands 65% above average old age pension.

Finally, 126 thousand of military retirees are the members of the last group of retirees with early retirement privileges. They can retire up to 15 years before statutory retirement age and, given that their benefits are more than twice as high compared to regular pensions, the monetary value of this privilege is quite high at 169mln rubles per person.

Out of 503 thousand retirees who have retired early 83 thousand are still younger than statutory retirement ages of 55 and 60 and 71% of these young retirees continue to work while receiving benefits. This underscores the failure of existing early retirement programs to target people that are unemployable or of poor health and calls for elimination or at least rethinking of the early retirement programs.

Left hand side of Table 3 demonstrates that majority of the EU countries where early retirement programs are in place disallow or restrict combining wage and pension income with some exemptions for low income retirees. This underscores a different rationale for the presence of these programs: in most EU countries early retirement is viewed as a last resort option for people who are no longer employable, while in Belarus early retirement is viewed as a right based on past occupation, valuable life-time contribution to the

society or a compensation for some special hardship. As labor markets modernize and become more flexible the notion of one life-time occupation becomes more and more outdated. Nobody can reasonably expect a ballerina to continue to perform on stage for 45 years, but she can and should be expected to find another worthwhile occupation at the later stages of her life.

Table 3. Treatment of working pensioners in EU countries.

Early retirement		Regular retirement	
Full pension allowed	Pension reduced (percent of reduction)	Full pension allowed	Pension reduction (percent of reduction)
Bulgaria	Belgium (up to 100% income tested)	Bulgaria	Belgium (up to 100% income tested)
France	Denmark (30% income tested)	Germany	Denmark (30% income tested)
Italy	Germany (income tested)	Estonia	Greece (70% income tested)
The Netherlands	Spain (reduced if full time work)	France	Spain (reduced if full time work)
Portugal	Cyprus (taxed by SS contribution)	Ireland	Latvia
Finland	Luxembourg (50% income tested)	Italy	Slovenia (100% income tested)
Slovakia	Estonia (100%)	Cyprus	
Sweden	Greece (100%)	Lithuania	
United Kingdom	Czech Republic (100%)	Luxembourg	
	Ireland (100%)	Malta	
	Latvia (100%)	The Netherlands	
	Lithuania (100%)	Austria	
	Hungary (100% income tested)	Poland	
	Malta (100%)	Portugal	
	Austria (100% income tested)	Romania	
	Romania (100%)	Finland	
	Slovenia (100% income tested)	Slovakia	
		Sweden	
		United Kingdom	

Source: EU MISSOC database (Social Protection Systems in Member States)

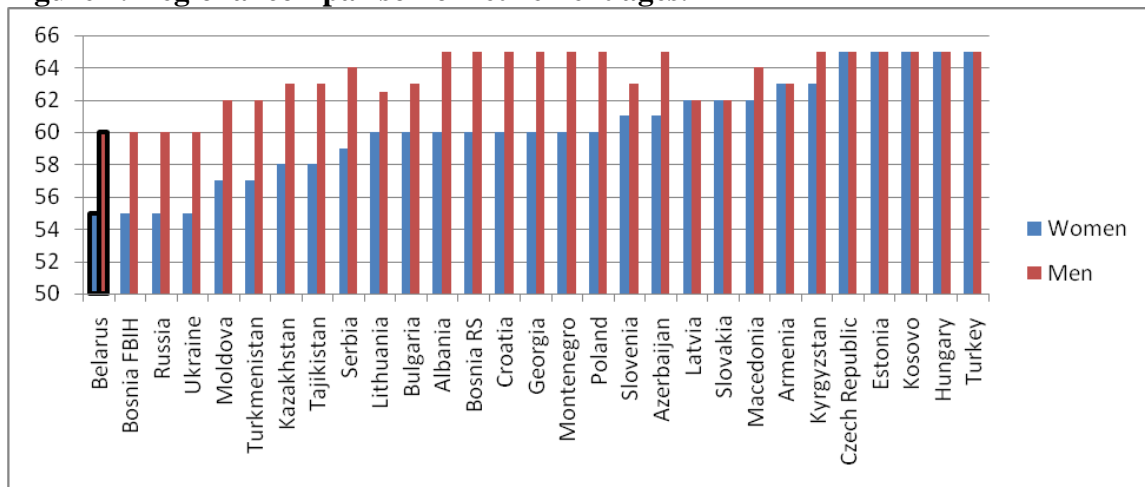
While disallowing or limiting accumulation of pension and wage income for early retirees is a sensible pension policy that helps to enforce statutory retirement ages, some countries have gone even further in trying to limit the accumulation of wage and pension for pensioners above regular pensionable age (see right hand side of Table 3). Very few countries apply such policy and those that do view it as a more politically acceptable alternative to retirement age increase. Belarus also limits combined wage and pension income, although at a relatively high level of 130% of average wage.

However, such policy, especially if taken to more extreme levels, can deliver mixed results. For example, in an attempt to reduce pension expenditures in 2009, Latvia has passed the law which cut benefits of working pensioners by 70%. The immediate response was that 50% of the affected group has quit the labor market. In this case savings from reduced benefits for 50% of pensioners who decided to continue to work were likely matched by the loss of social insurance contributions and income tax revenue from those 50% who decided to quit. Overall, this provision of the law has likely been budget neutral, while the income of affected group has been greatly reduced. In addition, high labor force participation of pensioners helps to transition public opinion towards the

norm of longer working lives and introducing barriers to such welcome behavior risks subverting that larger policy objective.

Figure 7 further demonstrates that current retirement ages in Belarus are the lowest in the region and far below the age 65 customary in OECD countries. Therefore, gradual increase in retirement age is a much better alternative than limiting the benefits for working pensioners above statutory retirement age. The five year difference between retirement ages for men and women is especially difficult to justify, given that the remaining life expectancy for women aged 55 is 23.5 years compared to only 14.5 years for men aged 60.

Figure 7. Regional comparison of retirement ages.



Source: World Bank database

It is sometimes argued that increasing retirement ages will lead to a reduction of employment opportunities for new entrants to the labor force and the currently unemployed. This is known as the “lump of labor” argument, and has been found to be false. The number of the positions in the labor market is not fixed. Many studies suggest that increasing the proportion of working elderly does not crowd out the jobs of younger cohorts as their experience and skill sets are very different. These two groups of workers are not good substitutes. The creation of new firms often requires both skill sets making young and older workers natural complements that can increase the productivity of the economy.

Pension Benefit Levels and Fiscal Projections

Old age pensions in Belarus are calculated according to a benefit formula, which takes into consideration the length of service and the wages earned over a specified reference period. In 2010, the length of the reference period is the last 26 years of service, of which the wages earned during any 16 subsequent years are used to compute the pension assessment base (PAB). The length of the reference period as well as the calculation

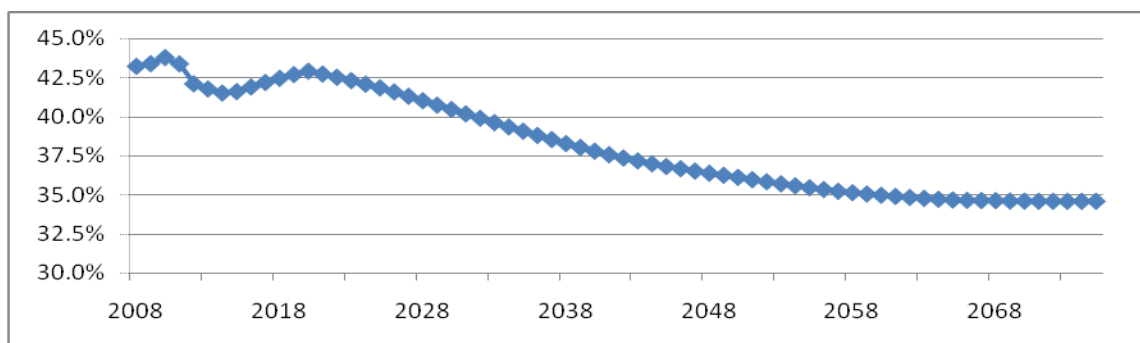
period is increased each year by one year until the calculation period reaches 35 years in 2029. This policy has been in effect since January 1, 2000.

To calculate pension assessment base ratios of individual's wage and economy wide wage are determined for each year and later averaged. Finally, the resulting averages for higher earners are increasingly suppressed in order to introduce quite significant redistribution from higher earners to lower earners and multiplied by current average wage. The effect of this procedure results in average PAB falling to around 2/3 of the average wage.

The old age benefit formula grants 55% of the individual pension assessment base for the first 25 years of service for males and 20 years of service for females. Old age pensioners accrue an additional 1% of the PAB for each year of service above 25 years for men and 20 years for women up to a limit of 20% of the PAB. The benefit is reduced proportionally for pensioners with fewer years of service, but at least 5 years of service are required to get a pension. Furthermore, the reduced benefit cannot fall below 50% of the legal minimum pension. Finally, pensions in payment are later indexed at a rate of nominal wage growth.

Figure 8 presents a baseline projection of average replacement rates, defined as average pension divided by average wage. As is customary in Belarus average wage used in this calculation incorporates social transfer payments, which are not subject to social security tax. Replacement rate defined as a proportion of insured income would be around 10% higher. Macroeconomic volatility of recent years is projected to be partially transmitted into the replacement rates in the next decade while lengthening period of wage base assessment is expected to contribute to the reduction of replacement rates in the medium to long run. Another important factor contributing to the decline of the average replacement rate is the policy of price indexation of minimum pension guarantee level. This results in gradual decline of minimum pension compared to prevailing average wage with minimum pension guarantee benefiting ever smaller proportion of pensioners.

Figure 8. Ratio of average pension to average wage.



Source: PROST projections

Average replacement rates presented in Figure 8 mask significant redistribution that is implicit in the benefit formula. The left-hand side of the Figure 9 shows the relationship

between pre-retirement earnings (horizontal axis) and expected pension level (vertical axis) for individuals with full careers. For example, an individual earning 0.5 of average wage can expect a pension equal to 0.3 of average wage, while an individual earning 2 times the average wage can expect a pension equal to 0.5 of average wage. Right hand side of the Figure 9 shows effective replacement rates that the system provides. It demonstrates that minimum wage workers can expect 95% of their pre-retirement income replaced after retirement while workers earning 2 times the average wage can only expect the replacement rate of 25%.

Figure 9. Income redistribution within the pension system



Source: World Bank staff projections, APEX model.

The degree of redistribution in Belarus pension system is analyzed in international context in Table 4. The first and third columns present Gini coefficients for Belarus and selected OECD countries. These coefficients take a value of 1 for the systems with maximum inequality and 0 for systems with completely equal incomes. Gini coefficients for Belarus show that the degree of equality among pensioners (column 1) is much higher than the degree of equality among workers (column 3). The progressivity index, presented in column 2, is designed to take the value of 100 for pension systems with completely flat benefits and a value of 0 for pure insurance schemes with no redistribution. Both Gini and progressivity measures suggest that the degree of redistribution within the Belarus pension system is relatively high and stands significantly above the OECD average.

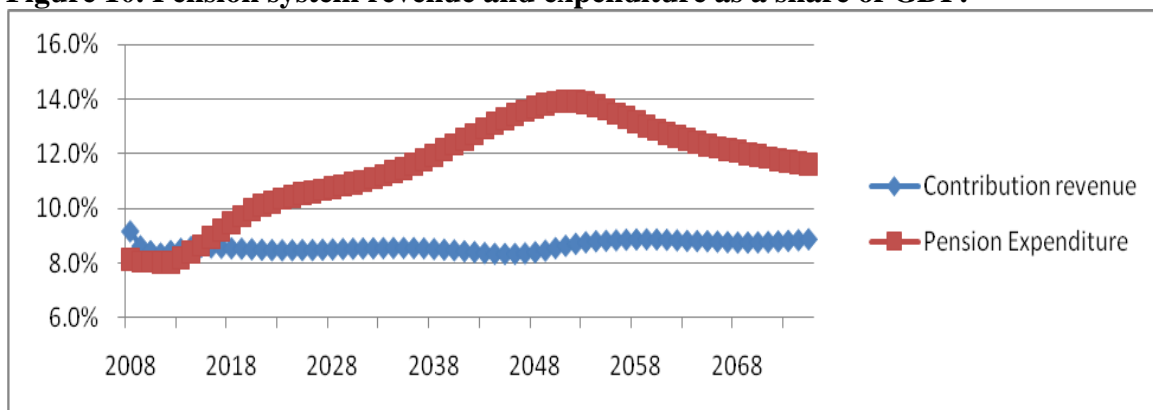
Figure 10 demonstrates the projected fiscal flows of the pension system of Belarus. While contribution revenue dedicated to the pension system is expected to stay relatively stable at around 8.5% of GDP, the expenditure is expected to start its relentless rise in the next few years even in the face of declining replacement rates. Eventual reversal of this trend around the year 2050 is conditional on the improved fertility rates as discussed previously in this note and is far from ascertained. At the peak of the fiscal strain around 2050 pension system deficit is expected to reach 5.3% of GDP.

Table 4. International Comparison of the Degree of Redistribution within the Pension System.

	Pension Gini	Progressivity index	Gini wage
Sweden	26.4	-14.4 ⁶	23.1
Hungary	33.6	0	33.6
Italy	23.3	1.8	23.7
Poland	29.2	4.1	30.5
Netherlands	24.3	5.7	25.7
Finland	22.6	5.9	24
Spain	25.7	17.1	31.1
Germany	19.8	24.7	26.3
Norway	13.6	38.1	22
Japan	14.3	46	26.4
United States	16.1	50.8	32.7
Belgium	10.2	52.6	21.6
Czech Republic	8.8	65.5	25.5
Korea	10.2	65.5	29.6
Belarus	11.2	67.5	34.5
Australia	8.1	70.1	27.2
United Kingdom	5.1	82.4	28.9
Ireland	0	100	29.6
New Zealand	0	100	27.7
OECD 18	16.2	39.8	27.2

Source: *Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries - OECD, 2009*; and World Bank staff estimates for Belarus.

Figure 10. Pension system revenue and expenditure as a share of GDP.



Source: *PROST projections*

⁶ Negative progressivity index reflects regressive benefit formula in Sweden as low and high income workers receive higher effective replacement rates than middle income workers.

Reform Options

Retirement age increase. The previous discussion already highlighted the rationale for retirement age increase in the difficult demographic environment, especially given already high labor force participation of young pensioners. Figures 11 and 12 illustrate the effect of such a policy if other pension system rules are not changed. Two options to increase retirement age are modeled, both including immediate elimination of early retirement program:

- **63/63, women first:** retirement ages for women are increased by 6 months per year until they reach parity with men at age 60 in year 2020 after which retirement age is increased by 6 months per year for both genders until they reach age 63 in year 2026.
- **65/65, both genders together:** retirement ages for women are increased by 6 months a year and those for men by 3 months a year until both genders reach age 65 in year 2030.

Figure 11. Ratio of average pension to average wage under different retirement age reform scenarios.

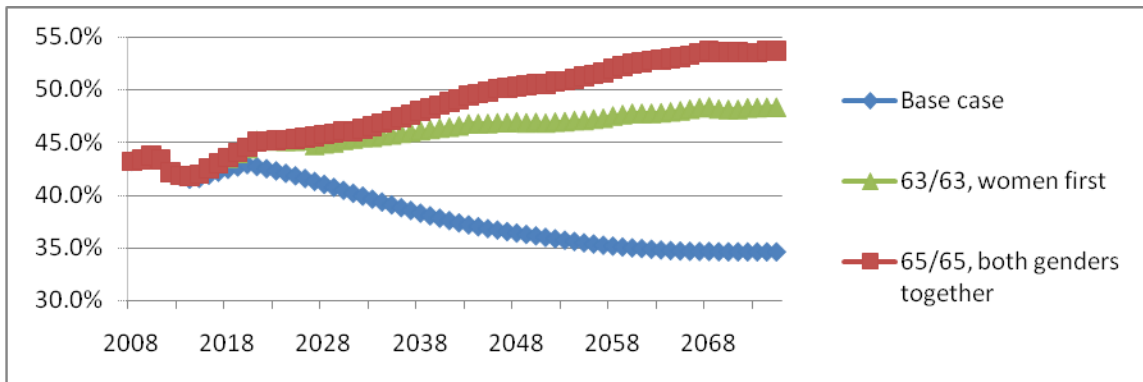
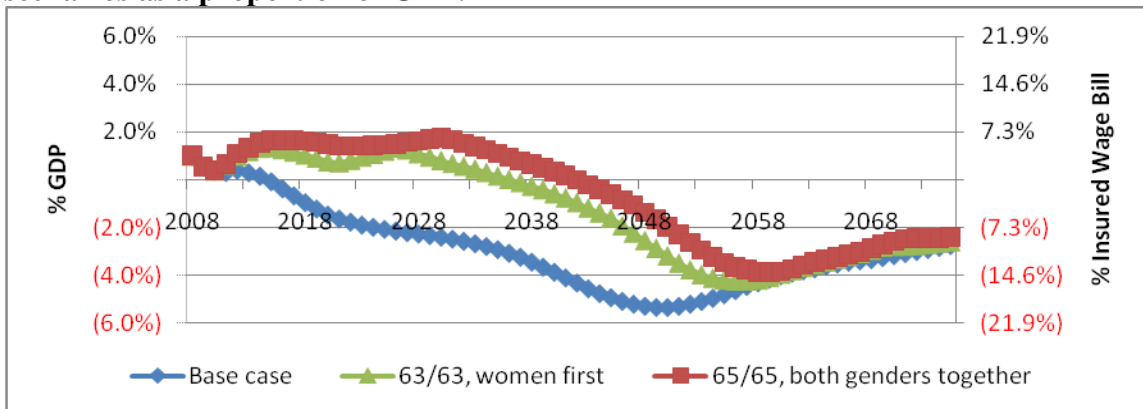


Figure 12. Projected pension system balance under different retirement age reform scenarios as a proportion of GDP.



Source: PROST projections

Figures 11 and 12 demonstrate that the policy of retirement age increase can both significantly improve system finances and substantially increase pension benefits. Without the change in benefit rules such a reform would stabilize and even increase pension system surpluses for almost 3 decades and would open fiscal space for some reduction in pension contribution rates. The right hand scale of the graph conveniently indicates by how much contribution rate can be decreased (if positive) or increased (if negative) to put the PAYG system in fiscal balance. However, in the long run most of the effect of such a reform would be felt through higher pensions rather than through the improvement in fiscal balances which calls for combining retirement age reform with some form of benefit reduction.

Less generous benefit indexation. Pension benefit indexation rules have a great influence on pension system expenditure. Stability of these rules is also extremely important for current and future pensioners as it can substantially reduce the uncertainty about their future income stream and allow better long term planning. Therefore, it is highly recommended that pension benefits continue to be indexed automatically based on observable macroeconomic indicators.

However, increasingly more and more countries are switching to price indexation of benefits which allows both to better control pension expenditures as well as guarantee that living standards of pensioners are maintained. Figures 13 and 14 demonstrate the outcomes of price indexation policy both when it is applied under current rules and when it is combined with retirement age reform.

The projections show that when price indexation is applied in combination with current retirement ages fiscal deficits are controlled but replacement rates decrease to around 20% which may be found socially unacceptable. This happens because short careers are insufficient to accumulate enough pension rights and because discrepancy between growth rate of wages and growth rate of pensions is applied over long retirement periods. While this allows maintaining living standards of pensioners, their purchasing power erodes in relation to prevailing wages.

Combining price indexation of benefits with retirement age reform offers much more balanced results. It creates fiscal space for some reduction in contribution rates (shown on the right hand scale of Figure 14) but also produces replacement rates comparable to those under no reform scenario in the long run. However, in a short run, which under our assumptions is characterized by high real wage growth, replacement rates are dropping quite precipitously as extremely high surpluses of up to 4% of GDP are being generated.

Therefore, to further enhance the reform package it would seem desirable to limit the difference between wage and benefit growth during the periods when economy and wages are growing fast. Recent experience in many Eastern European countries shows that when this discrepancy becomes too wide countries tend to revert to old discretionary indexation practices or try to devise patchwork solutions in a form of new pension supplements to select pensioner groups. An interesting example designed to avoid these shortcomings was a new Hungary's pension law introduced in 2009 that foresees price

indexation of benefits when GDP growth is below 3% and gradually increases the indexation parameter to 50% price + 50% wage growth when GDP growth is above 5%. Serbia has also introduced a similar law going into effect in 2012, according to which pensions will be indexed to prices when GDP growth is below 4%, but will get an additional increase equal to GDP growth minus 4%, when GDP growth is above 4%.

Figure 13. Ratio of average pension to average wage under different benefit indexation scenarios.

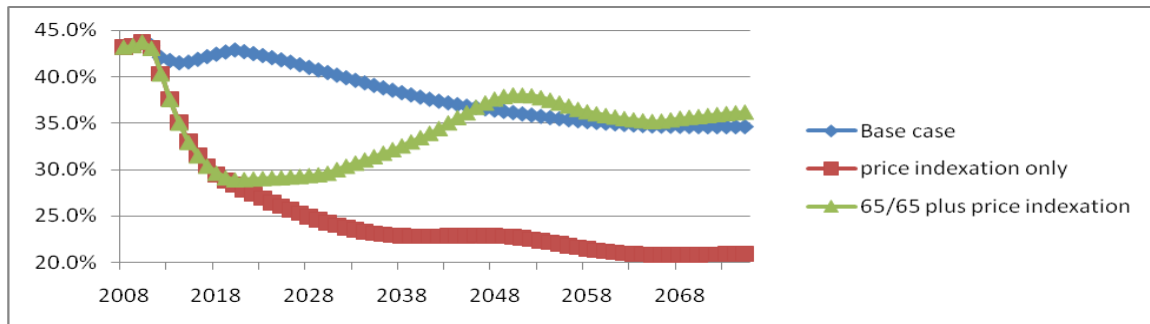
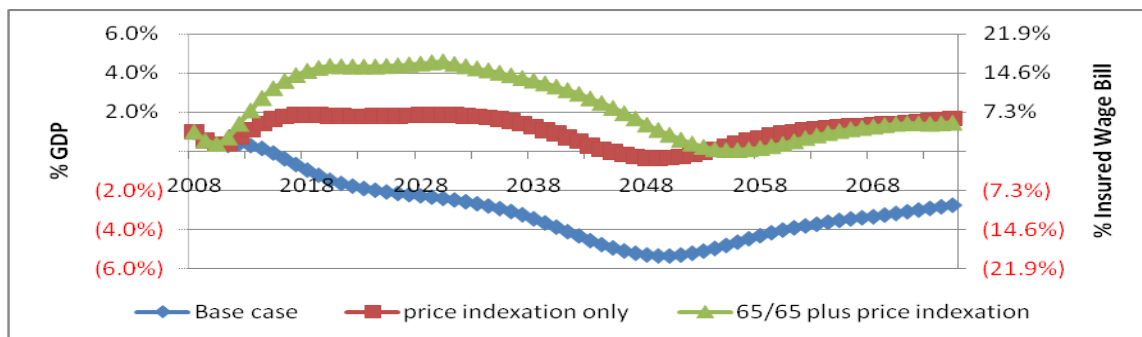


Figure 14. Projected pension system balance under different benefit indexation scenarios as a proportion of GDP.



Source: PROST projections

Designing a package of parametric reforms. The reform measures introduced above do not exhaust the possibilities for the design of a reform. Furthermore, countless reform packages can be designed by selecting different reform options for each pension system parameter. While it is not an intention of this note to select an optimal reform package for Belarus, the effects of one of the possible packages are presented in Figures 15 and 16. The package includes:

- elimination of early retirement option;
- increase of retirement ages for women by 6 months a year and for men by 3 months a year until both genders reach age 65 in year 2030;
- indexation of pension benefits to the higher of 1) consumer price increase or 2) nominal wage growth minus 3%;
- and gradual decrease of pension contribution rate from 29% in 2010 to 24% in 2015.

Figure 15. Ratio of average pension to average wage under the reform package.

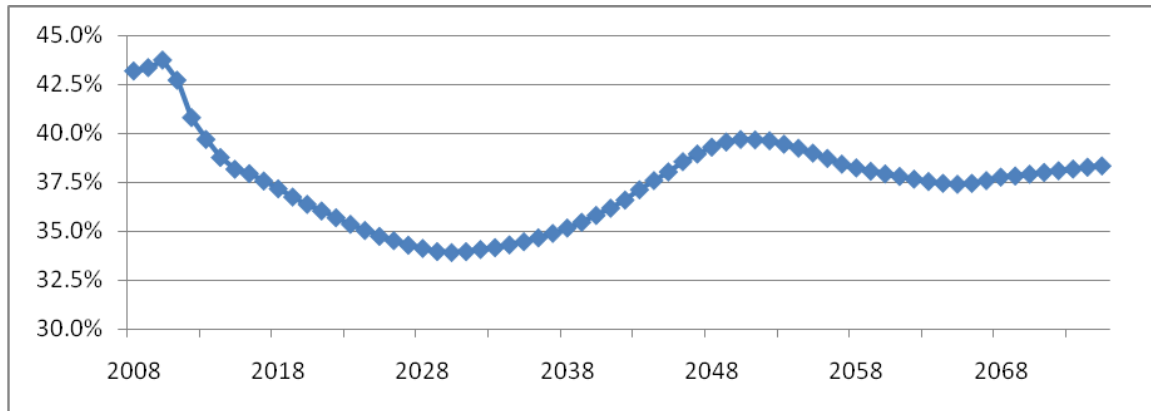
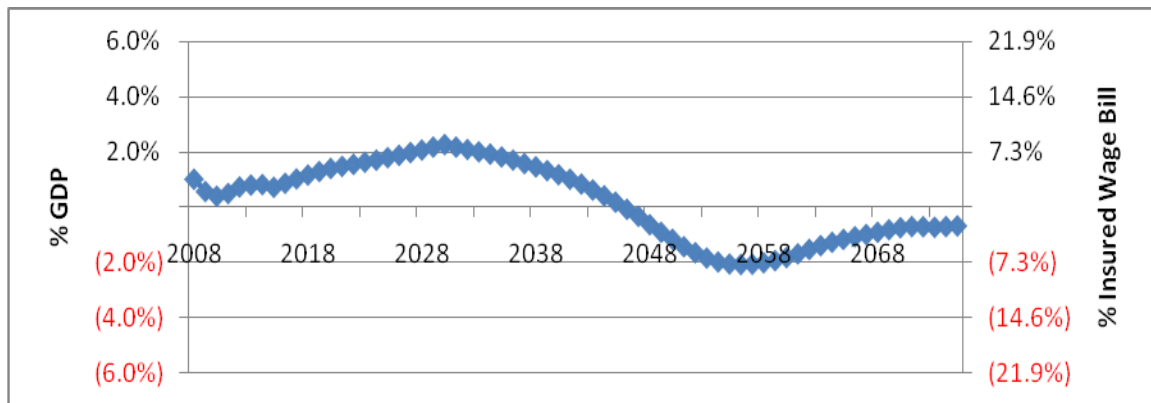


Figure 16. Projected pension system balance under the reform package as a proportion of GDP.



Source: PROST projections

Introduction of notional defined contribution accounts. Another reform option considered by policy makers in Belarus is the introduction of notional defined contribution scheme. The main features of such a scheme are discussed in Box 1, while some of the implementation pitfalls are shown in Box 2.

Figures 17 and 18 present one of the possible paths that the Belarusian pension system might take if notional accounts are introduced. The conversion of accrued rights in this example was made in such a way that differences between pensions of new pre-reform and post-reform retirees are minimized. Furthermore, from the start of the reform all pensions were assumed to be indexed to prices as otherwise initial pensions determined in the actuarially fair fashion would be extremely low in the long run.

Figure 17. Ratio of average pension to average wage under notional system.

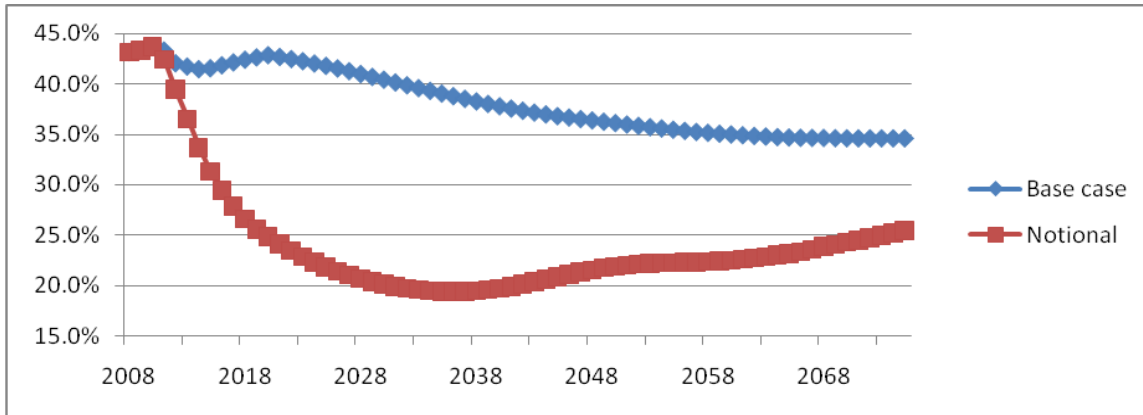
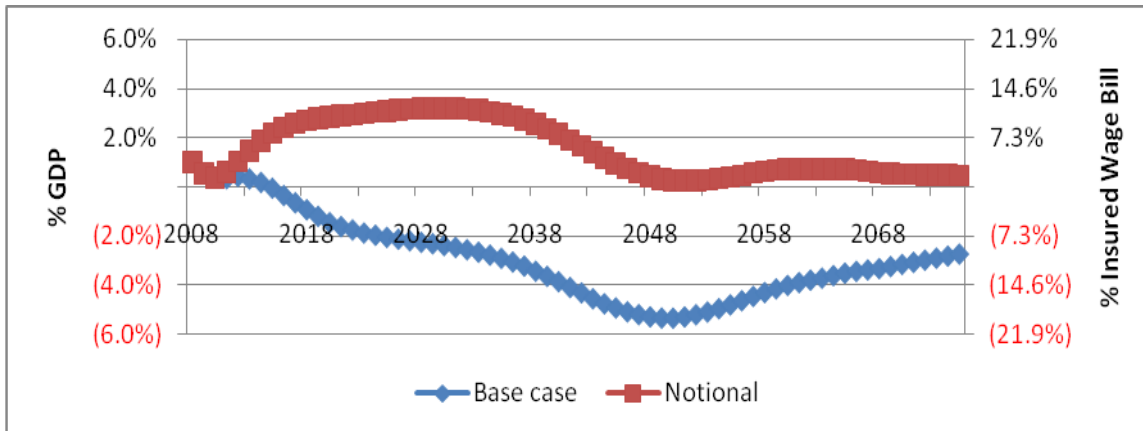


Figure 18. Projected pension system balance under notional system as a proportion of GDP.



Source: PROST projections

An attractive feature of notional account system is that it is self-balancing in the long run once stable macroeconomic and demographic conditions are reached. Under our assumptions for Belarus this happens around 2048 as shown in Figure 18. However, without an increase in retirement ages the balance is achieved at the expense of the low replacement rates in the range of 20% -25%. Replacement rates in the medium term could be improved by adjusting the mechanism of accrued right conversion, but that still would not guarantee fiscal balance for the next four decades. It would be tempting to use projected medium term surplus to lower the contribution rates, but that would reduce replacement rates in the long run even further.

Box 1. Main features of Notional Defined Contribution retirement accounts (NDCs)

Benefit formula. The retirement benefits paid from the NDC pension system are calculated based on an affiliated worker's accumulated lifetime contributions plus interest. This notional interest is usually determined by the growth of pension scheme revenue or insured wage bill. At the time of the retirement "notional account" is customarily converted into the annuity based on the observed life expectancy of current pensioners.

Financing mechanism. Just like with other pay-as-you-go (PAYG) schemes, the benefits are financed by contributions from currently insured workers. A buffer fund is usually recommended to manage surpluses and deficits that arise when current revenues do not match current expenditures. The buffer fund sometimes may have to be quite large to be able to absorb prolonged periods of pension deficits. This financing mechanism is fundamentally different from Funded Defined Contribution (FDC or DC) accounts, where the individual contributions are invested into the assets of contributor's choice and then sold at the time of retirement.

Incentives to participate. NDCs mimic the functioning of a simple savings account (government-managed) and are much more intuitive to understand than many prevailing formulas of conventional PAYG systems. This should, at least theoretically, strengthen the incentives of people to contribute to the system and to postpone their retirement. However, the experience suggests that these incentives are not sufficient to noticeably expand pension system coverage or increase effective retirement age. Most likely this lack of behavioral changes is due to very high personal discount rates that people apply in their daily financial decisions.

Reduced government involvement. By introducing the NDC system the government gives up its ability to influence benefit levels and fiscal situation of the pensions scheme and instead puts the system on "auto-pilot". The two major parameters governing the NDC pension system - notional interest rate and annuitization factors - are typically determined based on observable statistics, like growth of wage bill and life expectancy of the elderly. This might be viewed as a positive feature, given how politically difficult it is to adjust pension parameters like retirement age, contribution rate or benefit formula in conventional PAYG system. On the other hand, if benefit levels or fiscal balances become socially or fiscally unsustainable, the government has no levers to gently adjust the evolution of the system and has to resort to yet another structural reform.

Lack of redistribution. NDCs function like savings accounts, which does not allow for any redistribution from high to low income individuals, although explicit government contributions to individual accounts of subsidized worker categories is possible. Policy makers often attempt to introduce some redistribution from male to female members through unisex annuitization tables, but female members would still most likely be disadvantaged due to their shorter careers and lower statutory retirement ages. Without any redistribution, members with short careers or low wages are very likely to experience extremely low benefit levels and may need to rely on additional poverty prevention mechanisms in retirement.

Risk of volatility. Notional interest rates can experience significant fluctuations, especially in rapidly changing demographic, macroeconomic and institutional environments. This volatility can induce wide differentials between the replacement rates of two generations born a few years apart. Depending on which statistical variable notional interest rate follows and how long is the lag with which it is applied, such volatility could arise from sharp or prolonged shocks to fertility rates, degree of labor market formalization, effective retirement age, wage growth, inflation level, and pension contribution rates to NDC accounts.

Complicated transition rules. Introduction of NDCs requires well thought through transitional arrangements. Will all current workers be "converted" into the new system? If so, what is a fair and fiscally sustainable conversion formula? If not, what is the cut-off age? Will the chosen cut-off age introduce different outcomes for two cohorts born one year apart?

Box 2. Introduction of NDCs did not go as planned in some countries.

Latvia (NDCs since 1996) – real notional interest rate tied to the growth of wage bill averaged 17% between 2005-2009 due to rapid formalisation of economy, increasing retirement age and high wage growth. This led to 69% growth in average newly assigned pension from 2005 to 2009, compared to real wage growth of 28% during the same period. Instead of building up a buffer fund from 2005-2009 surpluses, most of the resources were used to introduce additional pension supplement and increase generosity of pension indexation, in part in order to soften the effects of replacement rate volatility. Due to the financial crisis of 2009 financing of the pension system burdened with new pension supplements became difficult and deficits have emerged earlier than planned. Negative real notional interest rates are foreseen in the next 3 years continuing the experience of volatile replacement rate outcomes.

Kyrgyzstan (NDCs since 1997) – the concept of NDCs was distorted at implementation as no interest is paid on past contributions resulting in low replacement rates and reduced incentives to contribute. This was partially due to low administrative capacity and the absence of reliable system of records. The system uses ad hoc annuitisation mechanism not related to observable life expectancies.

Russia (NDCs since 2002) – notional interest rate in Russia is tied to the revenue growth to NDC component of pension system. As contribution rate has been decreased and increasing portion of pension contribution was diverted to the funded pension component, the revenue stream to the NDC scheme has slowed compared to wage growth. This resulted in comparatively low notional interest rates and, eventually, pensions. To remedy the situation basic pension was increased in an ad hoc manner to raise pensions from 26% of average wage to 40% in 2010. Such a large basic pension component completely undermines the strong link between contributions and benefits that NDC reform was attempting to introduce. Moreover, without the increase in retirement ages or further increases in basic pension the system is projected to provide extremely low replacement rates in the future.