

Reform of Pension System in Russia Its Impact on Tax Evasion

Chikalova Maria

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Department of Economics

University of Oslo

Preface

I would like to thank my supervisors Karl Ove Moene. He helped me to put in words and formulas my thoughts and intuition.

I am grateful to my friend Olga Ivanova for her critical comments about the work.

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Abstract

The paper focuses on the current reform of pension system in Russia.

A number of serious drawbacks in pension provision call for introduction of a multipillar system. The superior performance of the multipillar system roots in the funded pillar. In contrast with PAYG pension scheme, the funded one has several important advantages. Among them are the ability to eliminate the distortion of individual labor supply and saving decision; and an accumulation of money available for a long-run domestic investment. Besides, the implementation of the funded pillar increases tax compliance. The last result is proved in the paper. This effect of the reform is of particular importance for Russia, where tax evasion is widespread.

The aim of the paper is to explain why, instead of the necessity of the reform and a superior performance of the funded system, we experience quite moderate size of the reform and a slow progress in the transformation to the multipillar pension system.

The main arguments are the following. The scale of the reform is determined by the government. The reform is costly. It demands a new law provision and an informational database to be created. There are current pensioners who have to be provided. At the same time, part of the contribution has to be withdrawn from the current pension provision and invested – according to the basic principle of the funded system. Thus the costs are high while the sources for financing are limited in Russia. Further increase of the social tax rate is impossible because of the negative effect on tax compliance. An external debt is not possible \ too costly because of the former borrowings. An internal borrowing is limited by the low trust of the population. In these conditions the self-financing ability of the reform becomes especially important: i.e. the reform increases tax compliance and the government uses this surplus for the financing of the transformation of the pension system and pension provision.

Since the result of the reform is determined by the interaction between the government and individuals, I use 2-stage sequential game to analyze the outcome of the reform. On the first stage the government determines the size of the funded pillar in the new multipillar pension system. On the second stage individuals respond on it by setting the part of the income they reveal. It is assumed that the government can estimate the individual response on the first stage.

It is shown that the outcome of the game is not Pareto-efficient, i.e. the scale of the reform and the increase in tax compliance are smaller than possible. Among the reasons that led to the inefficiency the major ones are the following. First, it is an inability of the

government to elicit higher compliance by other means than the very reconstruction. Even some punishment doesn't eliminate the inefficiency. The second reason is a self-financing of the pension reform and a lack of other sources. Third, the costs of the reform are increasing with the scale. Gradually it makes the corresponding increase in the tax compliance insufficient to cover the costs. The fourth reason is self-interests of the government, which cares about retaining the power and electoral support. Hence, it puts higher weight on current costs of the reform than on its long-run gain.

As long as the highlighted conditions exist and supplement each other the attempts to accelerate reform are unlikely to be successful.

Summary

The aim of the paper is to explain why, instead of the necessity of the pension reform and a superior performance of the funded system, Russia experiences quite moderate size of the reform and a slow progress in the transformation to the multipillar pension system.

There are several advantages of the Funded system in comparison with PAYG that made it very attractive in the present conditions of ageing of the population. They are a higher return on the contributions, a more active capital market, an increase in savings and investment (although there is a lot of discussion about it).

The flaws in the design of Russian pension system inherited from the USSR worsen the performance of pension provision especially in the difficult transition period.

The reform was urgent since Russian pension system faces a very serious solvency problem. A demographic crisis, a weak compliance and tax evasion reduce contribution inflow, while loose eligibility rights and a lot of privilege beneficiaries increase the outflow.

It was decided to introduce a multipillar system. The introduction of the funded pillar was stipulated by the following advantages: a closer perceived link between contributions and benefits, a higher return on contributions and an undistorted individual labour supply.

It is proved in the paper that the reconstruction contributes to the increase in tax compliance and restores the solvency of pension system. It is especially important in the conditions of the scarcity of other sources of financing of the reform (e.g. a state debt, a reduction of the benefits, or an increase of the social tax rate).

However, as long as the scale of the reform is determined through the interaction between the self-interest elective government and individuals, the outcome of the reform is not Pareto-efficient. In the paper the interaction is analysed by means of Stackelberg game. The inefficiency of the outcome means that the scale of the reform (or, alternatively, the size of the funded pillar) and the revealed part are not as high as they could be.

Thus the reform doesn't reach one of its main goals – the increase in tax compliance. It seriously undermines the ability of the new pension system to give sufficient provision to the elderly. There are several conditions in Russia which stipulate the inefficient outcome:

1. The surplus of revealed part of income caused by the reform is a main source for financing of the reconstruction of the pension system. External sources are limited by the debt-burden budget. An increase of the social tax rates is limited by their high level and its negative effect on the tax compliance. A contraction of eligibility rules as a source has been already exhausted. A further reduction of the benefits is not possible because of their low level.
2. Because of the necessary institutional and economical arrangements and the obligation to provide current pensioners the costs of the reconstruction are increasing with the scale of the reform. Gradually, the corresponding surplus becomes insufficient to cover the costs.
3. The scale of the reform is determined by an elective government. Because of the self-interests to retain the power, the government puts higher weight on current costs of transition than on the long-run gains of the reform. The possible reason can be an inability of the government to persuade citizens to tighten the living conditions today for the better pension provision in the future. The situation is peculiar for Russia, where there is a lack of trust of the population to such kind of promises.
4. The government has no other tools (in addition to the very introduction of the funded pillar) to elicit an increase in the compliance, i.e. tools to constraint utility level of agent. The change in power structure in favour of the government can eliminate Pareto-inefficiency. It is worth to note that such a change in power structure can be unfavourable for individuals. Because if the government can fix/constraint their utility levels, it may have a power to reduce the utility further down and made individuals worse off. So even though the outcome is Pareto-inefficient it can be more favourable for individuals to have some inefficiency with the

freedom, rather than to be squeezed by the self-interest government in the Pareto-efficient way.

As long as the highlighted conditions exist and supplement each other the attempts to accelerate reform are unlikely to be successful. This result corresponds to the way the current pension reform in Russia goes. The reform has a moderate scale and causes just a slight reduction in tax evasion.

The paper considers such instruments as a stricter punishment for tax evasion or a more even distribution of the social tax among employees and employers. These instruments reduce the tax evasion and increase the scale of reform. But still, they do not eliminate Pareto-inefficiency.

The paper is structured as follows.

Chapter 1 describes the origin of the problem. It emphasises the circumstances that made the reform of Russian pension system urgent.

Chapter 2 analyses the path of the reform by means of the game-theory approach. The special attention is devoted to the reasons of the moderate size and slow progress of the reconstruction.

Chapter 3 introduces additional policy instruments: a punishment for the tax evasion and a more even distribution of the social tax rate between an employer and employees. Afterwards I take a look on the current reforms launched in the end of 2001.

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Introduction

Recently there is a wide discussion all over the world about the reforms of pension systems.

Since the end of 19-th century, and especially since the World War II, most of the countries have established a public pension system based on the pay-as-you-go (PAYG) principle. According to the principle, current contributions of the active part of the population are transferred to the retired. The alternative way of organising pension system is a funded one, where the contributions of each worker are invested until his retirement. After the retirement he receives the accumulated money plus the income from investment in the form of either annuity or a lump-sum payment. The choice of PAYG system was stipulated by the growth of the economy and a favourable demographic situation, i.e. a growth of the population and a high ratio of an economically active part of the population to the retired one. The rentability of the PAYG system is equal to the growth rate of the economy, while the return on contributions to a funded system equals to the interest rate on the fund investment.

During the last decades the growth rates of both population and labour productivity were declining. It affects the growth rate of the economy. Figures 1-2 illustrate the change of the demographic situation. There are post and projected fertility and life expectancy combined by regions. The common path is a drop in fertility, increase in life expectancy and ageing of the population. Of course, the reasons of the aging vary among the regions.

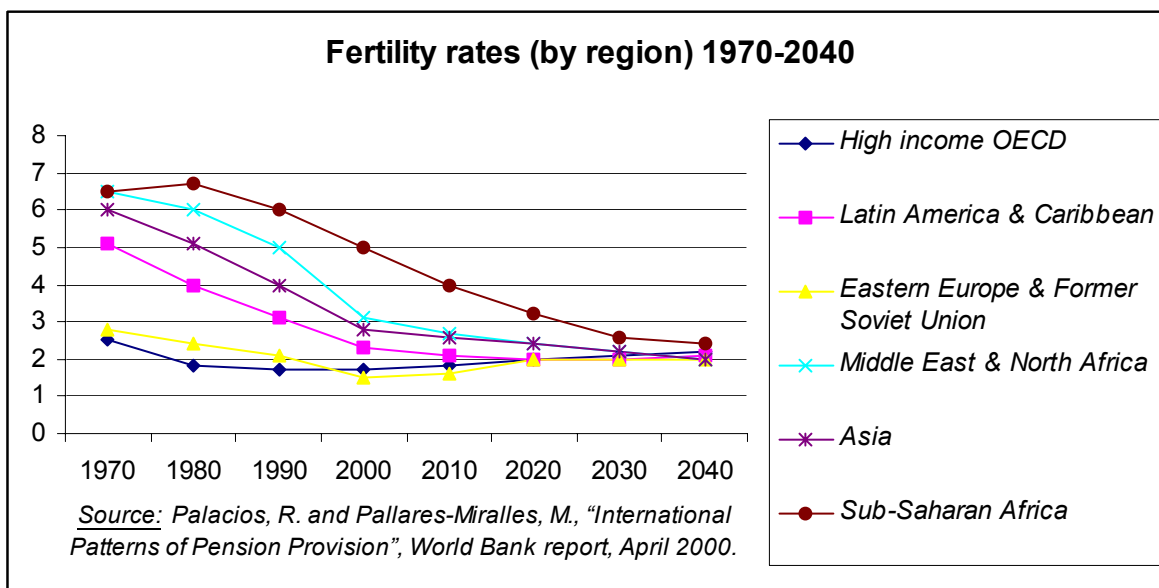


Figure 1. Fertility rates.

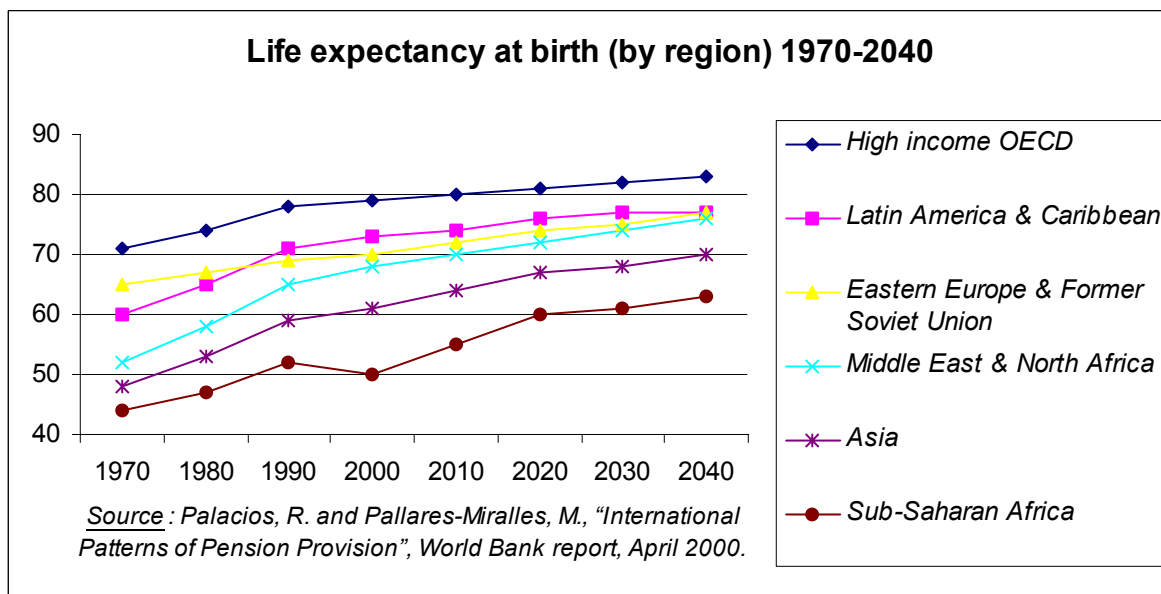


Figure 2. Life expectancy at birth.

These tendencies make pension provision based on PAYG principle harder and encourage countries to the partial or complete reforms of their

pension systems. Very often it is an introduction of the fully funded part in the pension system. It is hoped that the reform increases labour market efficiency, spurs a domestic capital accumulation and counteracts a growing dependency ratio. On the other hand, the pension reform is costly.

There is a vast amount of literature considering net effect of the reform. The tool commonly used for the analysis is a general equilibrium model. For example, Kortikoff (1996) made simulation analysis for USA and argues in favour of the funded system. Schimmelpfenning investigated this impact of the pension reform on a saving-investment balance and a current account balance for a small open economy. The result depends on the type of agents and a way of financing. He distinguishes between myopic and forward-looking agents. The latter change their contributions in response to the reform of the pension system, which increases a return on the contributions, while the former don't. In the economy of forward looking agents debt-financing leads to a reduction of savings and a fall of the current account balance, while tax-financing doesn't affect savings and doesn't deteriorate the current account.

In this paper I consider Russian pension reform. In addition to the unfavourable demographic path Russia experiences a transition. It makes the reform of the pension system not only more urgent but also more difficult. Financing through the increase of the social tax rate is not possible, as the rate is very high. The use of debt-financing is also limited by the shortage of the state budget. There is one source of financing left. It is an increase in the tax compliance. A non-transparent environment and high payroll taxes favour an informal labour activity and tax evasion. The poor compliance is a severe problem for Russian economy. According to different estimates the share of the hidden taxes is about 30-50% of the revealed amount. There is a hope that the reform of the pension system can handle the problem. The introduction of the funded pillar increases the return on contributions to the pension provision. Hence it induces individuals to reveal larger part of their incomes. This revealed surplus can be used for the very reconstruction of the pension system.

In the paper I analyse the connection between the scale of the reform and an individual response in terms of tax compliance ratio.

The structure of the work

In the first chapter, I describe the pension system, which was inherited from the USSR. I devote special attention to the circumstances that made the reform urgent.

The second chapter contains theoretical foundation of the problem. For the purpose of the paper I focus on the three types of the pension system: the Dutch type of PAYG, the German type of PAYG and the funded one. The pension system of the first type was inherited from the USSR. The combination of the second and third types is a projected multipillar pension system. For the description of the behaviour of economic agents for each system I use overlapping generation models.

It will be shown that the funded system creates the strongest incentives to reveal the wage. At the same time, it is quite costly for the government to transform the pension system into a funded one. Under the tight budget, the reform can significantly reduce current pensions and a social stability in Russia. The elective government weights the transitional costs higher than the expected gain, since gain has long-run character, while costs has to be born today. As a result instead of the funded system the government introduces a partially-funded system. I.e. only part α ($0 < \alpha < 1$) of the contributions is invested until the retirement period and the rest of pension system is organised as PAYG (German type). Such partially-funded system is called a multipillar system.

Economic agents response to α by determining what part of their income to reveal. The higher α the larger part of the wage is revealed. For the analysis of the interaction between economic agents and government I use the Stackelberg sequential game.

The present conditions lead to a Pareto-inefficient outcome of the game. The reason is that government has no power (credible instruments) to reduce the tax evasion problem further, even though it could be more preferable for both the economic agents and the government.

In the last chapter I relax some initial assumptions for the better description of the particular Russian situation. There are two instruments that can increase the tax compliance, apart the very reform. It is worth to take them into account when designing the new pension system. The first one is a punishment possibility. It is shown that the reduction of the tax evasion caused by the reform is greater in the presence of punishment. Another tool is a more even distribution of the social tax burden between employees and employer versus to the current situation when employer pays social tax.

Although the two tools reduces the tax evasion they leave the outcome of the game to be Pareto-inefficient, since they don't let government to constraint utility level.

Afterwards, I take a look on the current reforms launched in the end of 2001. The moderate scale of the reform corresponds to the result of the theoretical analysis.

Chapter 1

Russian pension system. Motivation for the reform

Russia inherited its pension system PAYG from the Soviet Union. In the soviet time the choice of PAYG was natural because of the redistributive character of the system and the solidarity between generations as its basic principle. A pension system is a part of the welfare state, the general path of which is determined by the political and economical background. The pension system served safeguard interests of a hierarchical structure of the Soviet State. The benefits of the people (wages, salaries, an access to public resources etc.) were determined by their position in the hierarchy. The higher position the higher the benefits. The type of welfare is called etatist. It creates a loyalty of the population and, thus, preserves itself. The whole economy was organised in the large state-owned enterprises and collective farms that provided full employment (hence loyalty) and suitable conditions for detailed planning, monitoring and controlling. The way the industry was organised helped to provide universal social security coverage and a well-developed social net.

At the time when the pension system was designed the ability to provide social benefits was hardly a serious issue. The tax collection was a matter of transfers within the state apparatus. Money can be easily obtained in the form of transfers from the central budget. Besides, there were a favourable demographic situation and an economic growth.

Hence the economic situation, the etatist type of the welfare state and the pension system based on PAYG-method supported each other and preserved by creating the loyalty of the population through the full employment and the sufficient average level of well-being

But even at that time the pension provision was not prosperous at all. According to Walter Connor¹ the pensions went unchanged from 1932 to 1956 even though the wages rose by ten times during that period.

Gradually, demographic and economic situations were changing, the population was growing old as a result of a drop in fertility. Initially, it was a result of the increase of the female labour force participation. A state rather than children provides the retired.

Further on, the downward demographic trend was supported by the economical problems accumulated from the faults of the central planning. I mention them briefly:

- The fixed structure of the industry that serves the purposes of the state rather than ordinary consumers.
- The resource constraint character of the economy, the main feature of which is the deficit and hoarding of the resources and goods.
- The decrease in the productivity as a consequence of a drop in the motivation of the people etc.

Over the 1956-81 period a minimum wage rose by 160% while a minimum pension by only 67%.² At the same period the pensioner population grew by 143%, that contributed to the state reluctance to raise pensions. Pensioners perforce turned to self-help and continued working. The USSR of the 1970-80s faced the problem of a chronic labour "shortage". It got some of extra workers it needed by the drawing on those who could not live on the pensions.

One of the features of the Soviet pension system was its universal coverage. It was also characterized by a tremendous variation among recipients. There were a great number of special privileges that depend on a period of working, a geographical location and occupational terms. The main reason of the high variety was that the state used the pension system as a tool

¹ Walter Connor, "Social Policy under Communism," in Ethan B. Kapstein and Michael Mandelbaum, eds., *Sustaining the Transition: The Social Safety Net in Postcommunist Europe*. New York: Council on Foreign Relations Press, 1997.

for non-pension provision purposes, e.g. to encourage people to work in the northern parts.

There were no private retirement plans.

The social tax is the main one paid by the employer from the payroll. In the USSR and then in Russia the burden of the social taxes was (and is) quite heavy: 38,5% of the payroll until 2001 and 35,6% since then. The social tax consists from the pension one (28%), the tax paid to the State and Regional medicine funds (3,6%) and the social insurance tax (4%). For comparison, there are pension and insurance tax rates for several countries listed in the table 1.

Table 1.1. Pension and social tax rates, mid-1990.

Country	<i>As percentage of Gross Wage:</i>			<i>As percentage of Total Labor Costs:</i>			
	Pension	Tax:		All Social		All Social	
	Employer	Employee	Total	Insurance Taxes		Pension Tax	Insurance Taxes
Armenia	35,0	1,0	36,0	38,0	26,3	27,7	
Belarus	22,8	1,0	23,8	24,8	19,2	20,0	
Estonia	20,0	0,0	20,0	33,0	15,0	24,8	
Georgia	37,0	1,0	38,0	41,0	27,1	29,3	
Kyrgyzstan	33,0	2,5	35,5	43,5	25,3	31,0	
Russian Fed.	28,0	1,0	29,0	40,0	20,9	28,8	
Albania	26,0	10,0	36,0	42,5	27,2	32,1	
Croatia	13,0	13,0	26,0	43,0	21,0	36,0	
Czech Republic	20,4	6,8	27,2	48,5	20,1	35,9	
Poland	45,0	0,0	45,0	48,0	30,4	32,4	
Slovenia	15,5	15,5	31,0	45,8	25,2	37,2	
Germany	10,2	10,2	20,3	42,0	17,0	34,0	
France	10,0	7,0	16,0	51,0	12,0	38,0	
Canada	3,0	3,0	6,0	15,2	4,9	13,9	
Switzerland	4,9	4,9	9,8	19,3	8,7	17,1	
United	6,2	6,2	12,4	21,0	10,4	18,5	

² Source is Walter Connor, see footnote 1.

States						
Mexico	10,9	4,6	15,5	26,0	6,5	21,5
Japan	8,3	8,3	16,5	29,1	14,1	24,9
Chile	0,0	13,0	13,0	21,0	12,9	20,7

Source: Palacios, R. and Pallares-Miralles, M., "International Patterns of Pension Provision", World Bank report, April 2000.

We can notice that, on average, social and pension tax rates are higher for the countries of the Former Soviet Union and Eastern Europe than for other regions (OECD, North Africa and Middle East, Latin America). The second common feature is small rates of direct workers' contributions paid from their personal income (1% in Russia). So the cost of pension provision are placed almost entirely on the enterprises. This is a heritage of the described above principle the welfare system of the soviet type was built on. According to it enterprises, the majority of which were state-owned, were responsible for the well-being of the workers, providing a social net and a social tax compliance. Soft budget constraints of the enterprises made it possible.

The transition worsens living conditions (a high inflation in the beginning of the transition period caused a decrease in the real wages in the formal sector) and strengthens the demographic patterns. On the figure 1.1 we can see the decreasing ratio of the population aged from 20 to 59 and those who are over 60. It illustrates the aging of the population.

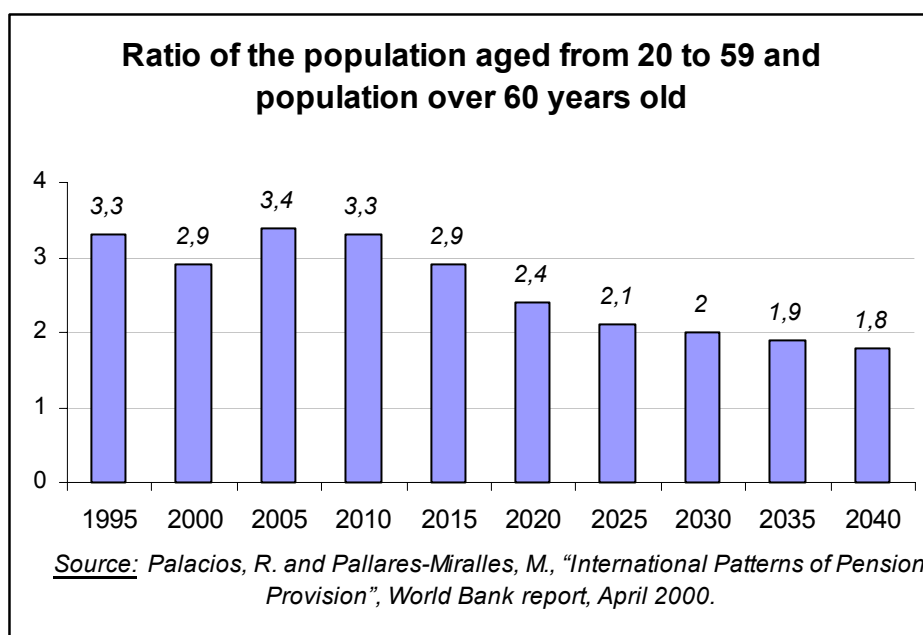


Figure 1.1. Past and projected ratio of the population aged from 20 to 59 and population over 60 years old in Russia.

The inherited drawbacks from the former system, accompanied with current transitional problems, made the pension provision harder.

The privatization broke the former structure of the industry. There were crucial changes in the industrial structure: the number of small firms and self-employed individuals increased; the transparency of environment decreased; the informal sector grew.

Budget constraints of the enterprises became hard. A high open unemployment favours a flexible employment policy to be the dominant one. Such conditions of the labour market construct certain type of employer-employee relations. An employer doesn't care about his workforce. Under these circumstances the high payroll taxes induce an informal employment³, an underreporting of incomes⁴ and a tax evasion problem. A non-transparent environment makes it possible.

Apart from the highlighted reasons there is another important problem that contributes to the low tax compliance.

Current PAYG has the highly complex system of benefits. The system guarantees near-universal coverage to a worker, regardless of his contributions. Initial pension benefits are typically based on the previous earnings and years of service. The eligibility rules are broad and differentiated, with special regimes for favoured occupations and other groups. There are a great number of preferential pensions. There is also a growing incidence of invalidity pensions and an early retirement, often with benefits that are higher than the average level.

The unfavourable demographic trends, the early retirement ages and growing informal sector reduce the number of contributors. In contrast, the

³ Besides of all it makes the employees of such enterprises unsecured (no contract, small pension fees paid for the workers).

⁴ The indirect evidence of hiding is the decreasing ratio of the wage in the overall incomes of population.

number of recipients is increasing. A quite severe increase of recipients is expected during the nearest 10 years. It is connected with the retirement of the kids of after-war-baby-boom.

As a result today in Russia system dependency ratio⁵ of the number of pensioners to the total employed is 60/100. According to the forecast it will increase up to 70/100 in 2015, 80/100 in 2023, 90/100 in 2033 and 108/100 in 2056.⁶

The growing dependency ratio, the low tax compliance, accompanied with the budget deficit and the shortage of the money available for social security purpose, leads to the solvency problem of the current PAYG. In spite of the high social taxes the State Pension Fund is unable to provide promised benefits⁷. It results in the accumulation of large arrears, an incomplete indexation, keeping a growth rate of the pension payment well below the growth rate of the nominal GDP. A pension expenditure didn't rise much in relation to the GDP during 1990s and even declined in the period between 1993-96.

In its turn, it makes employees unsure in their own future pension and reduces the incentives for workers to reveal their real incomes that lowers revenue inflows of the Pension fund. There is a vicious circle.

The forecast, which was done by *E.L. Iakushev*, illustrates that if we leave current pension system unchanged then pension will decline to 46% in 2050 (100% is the level of 1996). The analysis was carried by means of a simulation model of PAYG that takes into account the demographic trend and the following features of the current pension system:

- The contributions are equal to the 29% of the payroll,

⁵ We should distinguish between system dependency ratio, which was defined above, and demographic dependency ratio, which is the ratio between number of persons over 60 years and number of persons between 15 and 59 years. The last ratio for Russia is 36/100. The discrepancy between these two ratios illustrates that pension system was design with substantial drawbacks.

⁶ For OECD countries the ratio is 47/100, for Latin America and Caribbean it is 25/100, East Asia and Pacific region it is 20/100, North Africa and Middle East 30/100. The source is [1]

⁷ There are several reasons: misusing of the money in the non-insurance programmes, growing unemployment, shadow economy and hidden employment, fall in the real wages and wage arrears, growing debts of enterprises to the Pension Fund. For example,

- All economic active population (men from 20 to 60 and women from 20 to 50) pay the taxes,
- The benefits are paid to everybody who has reached the retirement age (60 for men and 55 for women),
- A redistribution principle of the pension system.

The result is represented in the figure 1.2.

In fact, PAYG became a crude safety net, providing small amounts of benefits to a large section of the population.

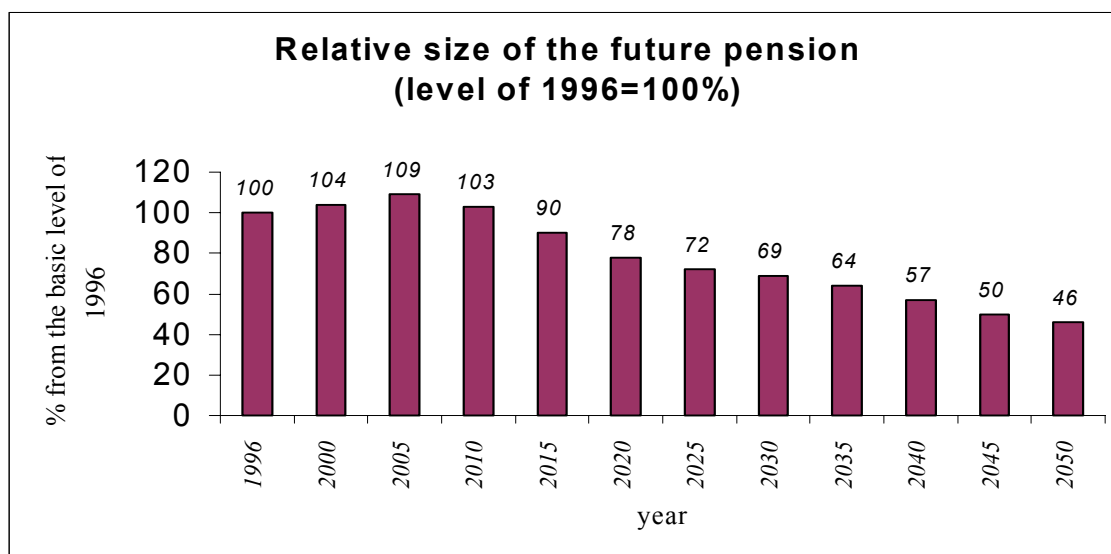


Figure 1.2. The size of future pension relatively to the level of 1996.

Source: E.L. Iakushev. *Crises in pension provision. Aged population and future Russian pension system. 1999*

So the situation argues for the reform to be held. A bankruptcy of current PAYG calls for the pension system built on different principles.

The alternative to PAYG, the funded system, has several important advantages: doesn't distort individual decisions about savings and labour-leisure, accumulates a pool of money available for domestic investment. It creates incentives to reveal wages through the clearer link between contributions and benefits.

in the middle of 1998 the debt was 88 bln. rub. that was equal to the half of the Fund's budget. Later on, there were penalties introduced to prevent arrears of paying taxes.

Since fully funded system is based on the completely different principles it is hard to establish it at once. The common among transitional countries solution is “multipillar” approach, which was chosen by Russia as well. It combines PAYG and the fully funded systems through the contributions to a retirement account. The first pillar is a current PAYG reduced in the scale, it implies a wide coverage of the population with a low provision. The second pillar is based on the funded principle. The part of the benefits corresponding to the funded pillar has a close connection with the contributions made by and in favour of the worker. In addition to the two pillars, it is planned to develop occupational and voluntary supplementary insurance schemes (third pillar).

Such reconstruction costs a lot. Hence, it puts a quite heavy burden on the government, which has to provide current recipients as well as accumulate and invest money for the next generation’s pension (according to the principles of the funded system). Besides, it has to build the infrastructure for the new second pillar: an informational database, a law provision, a control system over insurance companies. Since the life-insurance is very important for the social stability it is among the primary interests of the state.

So, taking into account a tight state budget, revealed wages can be a significant inner source for the financing of the reconstruction of the pension system. That’s why one of the targets of the reform is to change the behaviour of the economic agents and to induce them to reveal their incomes.

The paper examines the success of the reform with respect to the tax evasion. Chapter 2 analyses Russian reform by means of a simple game-theoretical model. Chapter 3 expands the model by including several important details omitted in the original model: the influence of the labour market and punishment for tax evasion.

CHAPTER 2

Before describing the behaviour of economic agents, a government and the interaction between them I should emphasise some details that are important for the analysis of the pension provision performance in Russia.

1. The problem of income hiding is especially severe for private enterprises of small and average size. In the non-transparent environment the companies have a lot of opportunities to hide part of the payroll. The reconstruction of the pension system from PAYG to the fully funded one is supposed to change mainly the behaviour (increase the revealed part of the income) of the individuals occupied in these enterprises. For large companies the opportunities to hide are reduced by the yearly obligatory checks of supervisors (the tax polity, accounting firms, etc.) But they still hide some part of the wages to reduce taxes. For state-owned enterprises the problem of revenue hiding is negligible. In the following model z is a revealed share of the income. As it was mentioned above, z varies among enterprises of different sizes and property-owners. I consider the average level of the incomes revealed by the economically active population.
2. For the time being I slightly exaggerate situation by assuming that this is the worker who pays social taxes from the income earned. In fact, in Russia an employer pays social taxes from the payroll. The interpretation of the assumption can be the following. The agent is considered to be a self-employed or a small firm. By the exaggeration I exclude the influence of the labour market. It doesn't change the results of the model. In the third chapter I drop the assumption to consider the labour market conditions.
3. A pension tax (29%) is a major part of a social one (35,6%). Further in the paper I focus the attention only on the pension tax (denote it τ), since I am interested in the pension provision, and neglect other taxes (the income tax 13,5% and non-pension social taxes).
4. The whole population can be divided into two parts:

- An economically active part. It is people before the retirement (N_t). They contribute to the pension system.
 - The retired (N_{t+1}) who receive pension benefits.
5. The demographic situation in Russia is an aging of the population, i.e. $N_{t+1}=(1-n)N_t$, where n is a rate of the decrease of the population.
 6. All agents are identical. The assumption is very strong, but it is not crucial for the result of the current analysis. The assumption allows to avoid an unreasonable sophistication.
 7. There is no informational asymmetry between the economic agents and the government. I.e. the government knows about hiding and can estimate the response function of the individuals. The information about government decisions is available.

2.1. The model of the individual behaviour

The life of every economic agent is divided by the retirement into two periods.

1. During the first one (active) before the retirement the individual works and earns all his life-time income w_t . From the payroll he has to pay social tax τ . Before paying he determines z – the share of the income that he reveals ($0 \leq z \leq 1$). The tax payment is equal to $\tau z w_t$. The individual is left with the disposable income $(w_t - \tau z w_t)$. Part of it is spent on the consumption in the first period $c_{1,t}$ and the rest s_t is saved and invested under the interest rate $r_{t+1,i}$. Subscript i denotes that it is the interest rate that individual can get on the personal investment. So in the next period individual get $R_{t+1,i} s_t = (1 + r_{t+1,i}) s_t$, where $R_{t+1,i}$ - is the return on the individual investment. Hence, economic agent has two options to save: (a) the personal saving with the return $R_{t+1,i}$ and (b) the contributions to the pension system with the return $R_{t+1,p}$. It is reasonable to expect the individual to choose the option with the highest return. I omit the possibility that the individual can be

caught and forced to pay some penalty. It is stipulated by the fact that in Russia the punishment penalty is not that high and individuals do not take the punishment into account when they determine z . An additional reason is that the attention of the paper is focused on how the transformation to a multipillar pension system changes the individual decisions about the allocation of savings between the two options. For this purpose I abstract from the punishment.

2. During the second period after the retirement an economic agent earns nothing, but he gets $R_{t+1,i}s_t$ from his private savings and p_{t+1} – the pension payment from the obligatory state pension provision. The money are spent on the consumption $c_{2,t+1}$.

Every agent compares returns on personal and pension savings and chooses s_t and z to solve the following problem

$$\text{Max } v(c_{1,t}, c_{2,t+1}) = U(c_{1,t}) + (1+\theta)^{-1} U(c_{2,t+1}) \quad (2.1)$$

Subject to budget constrains for the two periods

$$c_{1,t} + s_t = w_t - \tau z w_t = (1 - \tau z) w_t \quad (2.2)$$

$$c_{2,t+1} = R_{t+1,i} s_t + p_{t+1} \quad (2.3)$$

where $v(\cdot)$ is an individual utility function that can be separated for the two periods. The utility function has standard properties, i.e. continuous, concave and twice-differentiable $U' > 0$, $U'' < 0$.

θ is a discount rate. In the model we abstract from inflation.

From the budget equation (2.2) it is clear that the real tax $z\tau$ on the labour income is less than announced τ . The individual regulates the tax rate by himself. This is the core of the tax evasion problem.

The more detailed form of budget constraint (2.3) depends on the type of pension system. There are two main types: PAYG and Fully funded one. In real life countries have mixed pension systems. For the purpose of our analysis it is worth to describe three types:

1. Dutch type of PAYG.
2. German type of PAYG.

3. Fully Funded pension system.

The first type of pension system was inherited by Russia from the Soviet Union. The two other types are the parts of the designed new pension system.

Dutch Type of PAYG

Under this pension system the individual perceives the premium payment as a flat rate tax on his labour income; and the individual perceives the pension as a lump-sum subsidy.

All the contributions collected in the period t are distributed among the current recipients. PAYG has a distributive character.

It has another name “defined-benefit plans”, since contributors receive an “entitlement” to *predetermined benefits*, usually linked to workers’ age, years of employment and past earnings. But the benefits don’t depend directly on the contributions made in the active period.

Russia inherited this type of system from the Soviet Union.

To put it in numbers, such kind of a pension system implies that

$$p_{t+1} = \frac{\tau_{t+1} z_{t+1} w_{t+1} N_{t+1}}{N_t} = \tau_{t+1} z_{t+1} w_{t+1} (1-n) \quad (2.4)$$

The numerator is the contributions collected in the period $t+1$ and the denominator is the total number of pensioners in the period. I.e. the pension system has a distributive character. Pension payment p_{t+1} doesn’t depend on earnings in the active period w_t .

German Type of PAYG

This type of pension system remains distributive. I.e. all the contributions collected in the period t are distributed among the current recipients. The difference between the German and the Dutch types is that,

under the German System individual contributions are taken into account when defining a pension payment. Thus the connection between contributions and benefits is closer than under the Dutch System.

A pension benefit in this case is:

$$p_{t+1} = \left[\frac{\tau_t z_t w_t}{\Sigma_t} \right] \Sigma_{t+1} \quad (2.5)$$

where Σ_t is the total taxes collected in the period t. Due to the assumption about identity of all agents $\Sigma_t = \tau_t z_t w_t N_t$. And the expression in [.] in (2.5) is a share of payment made by the agent.

Assuming that $\tau_t = \tau_{t+1} = \tau$ and $z_t = z_{t+1} = z$, (2.5) can be rewritten as:

$$p_{t+1} = \tau z w_t G_{t+1} \quad (2.6)$$

where $G_{t+1} = \frac{w_{t+1} N_{t+1}}{w_t N_t} = \frac{w_{t+1}}{w_t} (1-n)$ is a growth factor of the total wage. It is affected by the demographic changes (through the term $(1-n)$), the technological progress and an increase of the labour productivity (through the dynamics of the wage $\frac{w_{t+1}}{w_t}$). It is followed from (2.6) that $R_{t+1,p} = G_{t+1}$, i.e. the growth factor of the total wage G_{t+1} is the return the individual can get on contributions to the German system.

Fully Funded Pension System

Its another name is *defined-contribution* plans. By contrast with the defined-benefit plans, the defined-contribution plans specify in advance the individuals' contribution to the pension system, but not the benefit. In this case, the contributions that every agent made during the active period are invested until the retirement. Future benefits depend on the accumulated contributions and the rates of return on the fund investments.

Under the fully funded system the pension payment is determined as follows:

$$p_{t+1} = R_{t+1,f} \tau_t z_t w_t \quad (2.7)$$

where $R_{t+1,f}$ is the return on contributions to the fully funded pension system.

Comparison of the different types of the pension system with respect to their ability to solve tax evasion problem

Let us start with the Dutch type of PAYG. The individual maximisation problem is (2.1) - (2.4).

By differentiating the individual utility function v with respect to z , we get $\frac{dv}{dz} = -\tau w_t U'_1 < 0$, where $U'_1 = \frac{\partial U(c_{1,t})}{\partial c_{1,t}}$ is the marginal utility of the first-period consumption. Since the pension payment p_{t+1} doesn't depend on the contribution, increase in z implies increase in the contribution without compensation in the form of increased benefits in the retirement period. So increase in z reduces the individual utility. Hence, a rational agent reduces z as much as possible and saves by his own for the retirement period. In terms of the model, he sets z to be equal to 0.

This is a quite usual situation in Russia where agents declare their incomes to be equal to the allowed deductions. These deductions are made from the payroll before the payment of taxes. This is a common way to set $z=0$. Of course, in real life the lower limit of z can be above 0 if we take into account the possibility of the officials to check the person and force him to pay some penalty. But the system itself doesn't create incentives to reveal income.

The first order conditions for the individual problem (2.1)-(2.3) for the Dutch system, where p_{t+1} is determined by (2.4), are:

$$\frac{\partial v}{\partial s} = -U'_1 + (1+\theta)^{-1} R_{t+1} U'_2 = 0 \quad (2.8)$$

$$\frac{\partial v}{\partial z} = -\tau w_t U'_1 = 0 \quad (2.9)$$

Where $U'_2 = \frac{\partial U(c_{2,t+1})}{\partial c_{2,t+1}}$ is the marginal utility of second-period consumption.

Under the German pension system, the first order conditions for the maximisation problem (2.1)-(2.3) and (2.6), will be (2.8), (2.10). It should be note that the first order conditions for the personal savings variable s are the same for all pension systems, since design of the pension systems doesn't change the personal saving opportunity. The mechanisms of savings to pension system vary among the pension systems.

For the German system it is

$$\frac{\partial v}{\partial z} = -\tau w_t U'_1 + (1+\theta)^{-1} \tau w_t G_{t+1} U'_2 = 0 \quad (2.10)$$

Thus

$$U'_1 = (1+\theta)^{-1} \tau w_t G_{t+1} U'_2 \quad (2.11)$$

So the individual chooses the personal savings (s) and the revealing parameter (z) so as to equalise marginal costs from the revealed share with the marginal revenue. The source of the marginal cost ($-\tau z w_t U'_1$): increasing z increases the tax payment and reduces the consumption in the first period. The marginal revenue is a discounted value of utility of the additional unit of the pension payment $(1+\theta)^{-1} \tau z w_t G_{t+1} U'_2$ received from the increased tax payment in the first period.

For the fully funded system the individual maximization problem is (2.1)-(2.3), (2.7) and the first order conditions are (2.8), (2.12).

$$\frac{\partial v}{\partial z} = -\tau w_t U'_1 + (1+\theta)^{-1} \tau w_t R_{t+1} U'_2 = 0 \quad (2.12)$$

I.e. the agent chooses point (s_t, z) so that the marginal disutility from paying the social tax is equal to the discounted value of the marginal utility from the increase in pension payment p_{t+1} in the after-retirement period.

As it was mentioned above, every person has two savings opportunities. Let us look on the individual marginal rate of substitution between the contribution to the pension system and the personal savings.

For the Dutch type of PAYG it is (2.13). It is derived from the maximisation problem (2.1)-(2.3), (2.4).

$$-\frac{dz}{ds_t} = \frac{\partial v / \partial s}{\partial v / \partial z} = \frac{-U'_1 + (1+\theta)^{-1} U'_2 R_{t+1,i}}{-w_t \tau U'_1} \quad (2.13)$$

For the German type of PAYG the marginal rate of substitution, which is derived from (2.1)-(2.3), (2.6), is

$$-\frac{dz}{ds_t} = \frac{\partial v / \partial s}{\partial v / \partial z} = \frac{-U'_1 + (1+\theta)^{-1} U'_2 R_{t+1,i}}{w_t \tau (-U'_1 + (1+\theta)^{-1} G_{t+1} U'_2)} \quad (2.14)$$

The two ratios differ because the denominators are different. The denominator in (2.14) is greater than that of (2.13) since $(1+\theta)^{-1} G_{t+1} U'_2 > 0$. So the transformation from the Dutch type of PAYG to the German type decreases the marginal rate of substitution between the contribution to pension system and the personal savings. In other words, an individual's value of the opportunity to save in the pension system increases relatively to the value of the personal saving opportunity. It illustrates that the reconstruction of PAYG from the Dutch type to the German one does create the incentives for the agent to reveal some wage, i.e. $z^{\text{GERM}} > z^{\text{DUTCH}} \approx 0$.

For the Fully Funded pension system (2.1)-(2.3), (2.7) the individual marginal rate of substitution between contribution to the pension system and personal savings is equal to

$$-\frac{dz}{ds_t} = \frac{\partial v / \partial s}{\partial v / \partial z} = \frac{-U'_1 + (1+\theta)^{-1} U'_2 R_{t+1,i}}{w_t \tau (-U'_1 + (1+\theta)^{-1} R_{t+1,f} U'_2)} \quad (2.15)$$

It is very similar to equation (2.14) for the German type of PAYG. It means that the transition to the funded system from the Dutch type of PAYG also creates the incentives to reveal an income. The only difference between the

marginal rates of substitution of the fully funded and the German systems is the return on pension contributions. For the German type of PAYG the return is G_{t+1} (growth factor of the total wage), while for the fully funded it is $R_{t+1,f} = 1 + r_{t+1,f}$.

As it was said above the population in Russia is sharply declines during the last decades. A demographic forecast predicts that the situation will remain the same. If in addition we neglect the technical progress (i.e. $w_{t+1} = w_t = F_L(K_{t+1}, L_{t+1})$) then the return $G_{t+1} = 1 - n$. Thus the return G_{t+1} on individual contributions to the German type of PAYG is less than the one of the fully funded system $R_{t+1,f}$. It makes the fully funded system more preferable for individuals, since the return on contributions is higher than that of PAYG.

Hence the denominator in the right-hand side of (2.15) is greater than that of (2.14). It means that for an individual the relative importance of the savings to the pension system ("relative" with respect to private savings opportunity) is higher for the fully funded pension system than for the German system. Thus the funded system induces the individual to reveal the higher share of income (z) than PAYG and solves the tax evasion problem better.

"Multipillar" Pension System

The advantage of the funded system in dealing with tax evasion problem can be seen from the analyses of the performance of the following "multipillar" pension system. It consists of two pillars: (i) the German type of PAYG and (ii) the funded pillar.

α is a share of the funded system.

The budget constraint for the retirement period (2.3) is

$$c_{2,t+1} = R_{t+1}S_t + (\alpha R_{t+1} + (1-\alpha)G_{t+1}) \tau z w_t \quad (2.16)$$

Where $R_{t+1} = R_{t+1,f} = R_{t+1,i}$. It is assumed for simplicity that the return on contributions to the fully funded pension system $R_{t+1,f}$ is equal to the return on the individual investment $R_{t+1,i}$.

The first order conditions for the problem (2.1)-(2.3), (2.16) are (2.8) and (2.17).

$$\frac{\partial v}{\partial z} = -\tau w_t U_1' + (1+\theta)^{-1} \tau w_t U_2' [\alpha R_{t+1} + (1-\alpha)G_{t+1}] = 0 \quad (2.17)$$

From the system of the first order conditions (2.8) and (2.17) we obtain (2.18).

$$\frac{dz}{d\alpha} = \frac{-U_2'(U_1'' + (1+\theta)^{-1} R_{t+1}^2 U_2'') + U_1'' U_2'' \tau w_t (1-\alpha)(R_{t+1} - G_{t+1})}{U_1'' U_2'' \tau w_t (1-\alpha)^2 (R_{t+1} - G_{t+1})} \quad (2.18)$$

Because of the assumptions made about the shape of the utility function the denominator is positive. Thus the sign of the whole expression depends on the sign of the numerator. Taking into account that $R_{t+1} > G_{t+1}$ (was shown above), the sign of the numerator coincides with sign of the following expression:

$$-U_2'(U_1'' + (1+\theta)^{-1} R_{t+1}^2 U_2'') + U_1'' U_2'' \tau w_t (1-\alpha)(R_{t+1} - G_{t+1}) \quad (2.19)$$

It is easy to see that the expression (2.19) has a positive sign.

As a result, $\frac{dz}{d\alpha} > 0$. It means a comparative advantage of the funded system in its dealing with the problem of tax evasion.

This is quite intuitive result because the individual invests money to the more profitable option. The return on the saving to the funded system R_{t+1} is greater than 1 and, hence, higher than the return of PAYG G_{t+1} , which is less than 1, because of the unfavourable demographic trend and neglected technical progress. A higher share of the funded pillar α increases the return on the pension savings and induces individuals to reveal the larger parts of their incomes.

Multipillar pension system, which is introduced now⁸, has α equal to 0,07 with a further increase up to 0,2 (or in terms of contributions 2-6% from 28% tax is invested until the retirement period).

⁸ Law about pension provision was accepted in December 2001. According to it "new" pension system has to be introduced in the 2002.

On the figure 2.1 there are the indifference curves of the economic agent and the response curve $z(\alpha)$, which is proven to be upward sloping with the decreasing marginal propensity to reveal. The response curve is the locus of the lowest points of the indifference curves. Since in the absence of the funded pillar $\alpha=0$ the pension system is of German type, the individual reveals some share of the wage. It was shown above that the German type of PAYG reduces the tax evasion problem, although not so effectively as the funded one.

There can be the following explanation of the shape of the indifference curve in the z - α space. A higher share of the funded pillar α implies a higher return on the pension contribution and increases utility level v .

In its turn, an increasing z implies higher tax payment in the first period and higher pension payment in the second. Thus the utility of the first period consumption U_1 decreases, while the utility of the second period U_2 increases. However the impact of z on the total utility v varies for different z . For small z the increase of the second-period, caused by the increased pension, is higher than the corresponding decrease of the utility, caused by the drop of the first-period consumption. Thus the total utility v increases. To keep utility level constant we have to decrease α . It stipulates the decreasing part of the indifference curve in the z - α space. The higher z the greater the marginal disutility of the further reduction of the first-period consumption and the less is the marginal utility of an increase of the pension payment (it follows from the concavity of the utility functions U -s). Hence the total utility v decreases. To keep it constant we have to increase α . It stipulates the increasing part of the indifference curve.

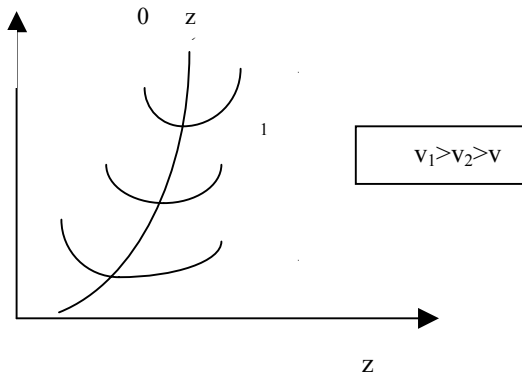


Figure 2.1. Indifference and response curves of the economic agent.

We can rank systems with respect to their ability to solve the tax evasion problem as follows: the funded one is the first best, the German type of PAYG is the second best.

Influence of the tax rate and general economic conditions on the tax evasion

Let us now investigate how individual propensity to reveal z depends on τ and θ .

By differentiating both first order conditions (2.8) and (2.17) for the maximization problem in the case of multipillar pension system and by applying Cramer's rule it can be obtained.

$$\frac{dz}{d\tau} = - \frac{(1+\theta)^{-1} (\alpha R_{t+1} + (1-\alpha)G_{t+1} - R_{t+1})^2 U_1'' U_2'' z w_t}{(1+\theta)^{-1} (\alpha R_{t+1} + (1-\alpha)G_{t+1} - R_{t+1})^2 U_1'' U_2'' \tau w_t} = - \frac{z}{\tau}$$

The function $z(\tau)$ is decreasing. It is convex. To show this I differentiate the above equality with respect to a tax rate τ .

$$\frac{d^2 z}{d\tau^2} = \frac{z}{\tau^2}$$

When the social tax rate increases, the individual reveals smaller share of his income and hides more income. The positive marginal propensity

$\frac{d^2 z}{d\tau^2} = \frac{z}{\tau^2}$ means that the hiding problem becomes more severe with the

increased tax rate. Thus, financing of the reform through the increase of the social tax rate has a serious drawback – a drop in the tax compliance.

In connection with the result it is worth to mention that in 2001 the rate of the social tax was reduced from 38,5% to 35,6% although the pension tax remained the same (28%). The social tax became regressive. Such kind of tax is supposed to create incentives to reveal the incomes. But the possibility to use the regression is available for companies that pay more than 100.000 rbl. to each worker (it is 3.500\$) annually. It implies quite high salaries. For comparison, according to the Committee of State Statistics, an average per capita money income is about 1600\$.

Let us now consider the effect of the increased discount rate θ .

From the same system of first order conditions (2.8), (2.17) by the calculations for θ , similar to those for the tax rate, we derive

$$\frac{dz}{d\theta} = \frac{(1+\theta)^{-2} U_2'(\alpha R_{t+1} + (1-\alpha)G_{t+1})}{\tau w_t [U_1'' + (1+\theta)^{-1} U_2''(\alpha R_{t+1} + (1-\alpha)G_{t+1})^2]} < 0$$

We can give at least three interpretations to the result:

- a) The increase of the discount rate makes the future less valuable for the agent. Hence he prefers to spend his income on the consumption in the first period and decreases the revealed part z .
- b) The second interpretation of θ is a measure of trust of the agent to the government. The higher θ the less trust and the less individual propensity to reveal income. By only increasing the trust we can get larger reduction in the tax evasion. Actually, the problem of the trust is a key one for Russia. An indicator of the distrust of the population to the state pension policy can be illustrated by the results of the inquiry that was held by the Russian Research Center in 1-5 of June 2001. One of the questions was “Would you pay voluntary contributions to the state pension system to get benefits in addition to an ordinary state pension payment”. The result was 51% “yes” versus 40% “no”.

- c) The third interpretation of θ is a risk that whether the individual or system may not be alive in the second period. With respect to the survival of the pension system it means that the pension system may be replaced by the totally different one due to the change of the whole economic and social systems.

In terms of the individual response curve, the increase of tax rate or uncertainty (reduction in trust to the government) shifts the response curve to the left. And for every α the revealed part of the income becomes smaller.

Comparison of German type of PAYG and the Funded system with respect to distortion of individual saving and labour-leisure decision

Let us now, turn back to the comparison of the two pension systems the German PAYG and the funded one.

One of the advantages of the funded system is the accumulated capital that can be invested in a domestic economy.

Besides, the funded system doesn't distort an individual decision about savings. To prove this statement let us consider the economy without any pension system. The individual maximization problem is

$$\text{Max } v(c_{1,t}, c_{2,t+1}) = U(c_{1,t}) + (1+\theta)^{-1} U(c_{2,t+1}) \quad (2.20)$$

Subject to the budget constraints for the two periods

$$c_{1,t} + s_t = w_t \quad (2.21)$$

$$c_{2,t+1} = R_{t+1,i} s_t \quad (2.22)$$

It is easy to check that the first order conditions of the problem are identical to the ones in the case of the funded pension system (2.8) and (2.17). The reason of the equivalence is that the agent considers pension contributions as personal savings, when the return (R_{t+1}) on contributions in the funded system is equal to the return that the agent can get on his personal savings.

It was shown above that the first order conditions of the both types of the PAYG differ from (2.8) and (2.17). Hence PAYG does distort the individual savings behaviour.

Several papers⁹ are devoted to the problem of the labour supply distortion. It arises when labour supply is considered to be an endogenous variable that depends on the net wage rate.

In the case of an endogenous labour supply the individual problem can be represented as (2.23)-(2.25):

$$\text{Max } v(c_{1,t}, c_{2,t+1}, 1-L_t) = U(c_{1,t}, 1-L_t) + (1+\theta)^{-1} U(c_{2,t+1}) \quad (2.23)$$

With respect to s_t and L_t .

Subject to the budget constraints for the two periods

$$c_{1,t} + s_t = (1-\tau z)w_t L_t \quad (2.24)$$

$$c_{2,t+1} = R_{t+1}s_t + p_{t+1} \quad (2.25)$$

where L_t is an individual labour supply, and $1 - L_t$ denotes leisure.

From the first order conditions for the three types of pension systems (the types differ because of different form of the pension payment p_{t+1}) we derive the marginal rates of substitution between the leisure and consumption. The result is presented in the table 2.1.

Table 2.1 Marginal rate of substitution in different systems.

Type of pension system	Marginal rate of substitution
No pension system ($\tau=0$)	$\frac{U'_{1-L}}{U'_1} = w_t$ or $\frac{U'_{1-L}}{U'_2} = (1+\theta)^{-1} w_t R_{t+1}$
PAYG Dutch type	$\frac{U'_{1-L}}{U'_1} = w_t(1-z\tau)$ or $\frac{U'_{1-L}}{U'_2} = (1+\theta)^{-1} w_t R_{t+1}(1-z\tau)$
PAYG German type	$\frac{U'_{1-L}}{U'_2} = w_t(1+\theta)^{-1} [R_{t+1}(1-z\tau) + G_{t+1}z\tau]$

⁹ E.g. Homburg, S. (1997), Brunner, J. K. (1996)

Funded	$\frac{U'_{1-L}}{U'_1} = w_t$ or $\frac{U'_{1-L}}{U'_2} = (1 + \theta)^{-1} w_t R_{t+1}$
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U'_{1-L} - the marginal utility of leisure.

The first row corresponds to the benchmark case, when there is no pension system, and hence no distortion in the supply of labour. The marginal rate of substitution corresponding to the funded system is the same as in the benchmark case (it holds as long as return on pension saving is equal to return on personal saving). It means that the funded system doesn't distort the labour-leisure individual decision. By contrast, the marginal rates of substitution for both types of PAYG differ from the benchmark case. PAYG increases a relative utility of leisure, reduces labour supply and makes individuals worse off.

The PAYG payroll tax drives a wedge between a consumer wage and labour costs. There is no fiscal equivalence between contributions and benefits and the implicit rate of return of PAYG is lower than return on personal savings. It leads to the reduction in the labour supply.

Hassler and Lindberck (1997) showed that the labour decision would be distorted as long as a marginal increase in contributions generates an increase in benefits with a lower market value to individual than the value of contributions. So the funded system, as one that increases the ratio of marginal contributions to marginal savings, induces higher labour supply and reduces the labour distortions caused by the payroll tax.

Financing of PAYG from the social tax on the labour income implies a dead-weight loss. The higher the tax rate the larger the dead-weight loss. Under the German type the individual considers only part of the contributions as the tax on labour income. It can be derived from the first order conditions of the maximization task for the German type that the implicit tax rate = $z\tau[1 - \frac{G_{t+1}}{R_{t+1}}]$. It is less than tax rate $z\tau$. The share $z\tau \frac{G_{t+1}}{R_{t+1}}$ of the tax is perceived by the individual as "savings". Thus the German type of PAYG

implies less dead-weight loss than Dutch one. The ranking of the systems with respect to the labour-leisure distortions coincides with the one with respect to the ability to solve the tax evasion problem: the funded is first-best, the German system is the second-best.

It is shown by Stefan Homburg (1997) that, as transition to the funded system eliminates this dead-weight loss, the government can use the surplus for Pareto-optimal converting to a funded system. The main transitional problem is that at the same time the government has to not only accumulate and invest contributions of the current active workers, but also provide presently living elderly. Homburg suggests converting the implicit dead-weight loss into a regular government debt. The funded system makes the following generations better off. It allows an increasing taxation of the following generation to reduce the government loan.

Johan Brunner (1996) extends the model by relaxing the assumption about identical individuals. His conclusion is that “any replacement of PAYG by the funded system, intended to reduce the dead-weight loss, normally involves intragenerational redistribution and therefore conflicts with Pareto criterion. The main argument goes as follows. If the growth rate of the economy is lower than the interest rate, a contribution to PAYG pension system reduces life-time income. The loss is the higher, the higher the contributions. Thus, given that individuals have different incomes, PAYG system imposes different losses of the life-time income on them. As a consequence, if proportional contributions (and benefits) are replaced by lump-sum ones, the condition for Pareto-improvement requires that the lump-sum contributions are in some way differentiated between individuals (as in proportional system). However, this instrument is not available, because the government does not have precise knowledge that are necessary to identify individuals by their primary characteristic.”

As an alternative method of initiating a transition to the funded system (instead of lump-sum taxation), we could replace the proportionality rule by a more sophisticated method of determining income-related contributions and

benefits. Such a change might also reduce the excess burden caused by PAYG, and this gain might allow a Pareto-improving transition. In his studies Brunner considers an affine relation between contribution and gross income. But again, the introduction of such a rule would represent an act of redistribution, making at least one individual worse off. He concludes that, except in special cases, no implementable instrument exists that could be used for a Pareto-improving transition from PAYG to the funded system.

2.2. Government decision

Now it is time to summarize the advantages and drawbacks of the two alternative pension schemes – PAYG and the Funded one.

PAYG

The drawbacks of PAYG are related to efficiency, equity and risk problems.

Problems related to efficiency

- Large PAYG systems typically result in the labour market distortions. The high level of contribution rates is needed to support the systems, combined with a loose link between benefits and contributions, transform the contribution rate into tax. It results in the reduction of the employment and tax compliance and the development of underground activities. Furthermore, often generous early retirement provisions lead to a decline in the labour participation rates of cohorts of those who are younger than the statutory retirement age (and therefore to decline in contribution base).
- It is often argued that PAYG pension schemes reduce incentive for private savings and capital accumulation. However the evidence of it is not conclusive and the impact of pension reform on private saving behaviour remains controversial. I've already mentioned the work of Schimmelpfenning (2000) related to the topic.

Problems related to equity

- Although one of the main advantages of mandatory defined-benefit public pension scheme is its ability to redistribute income from high to low-wage workers, the evidence from industrial countries suggests that in practice the system tend to be regressive. This is due to design features that tend to benefit workers with a high-income profile. The high-income people live longer, have rising age income profiles, and join labour force later (and thus have shorter contributory periods). This drawback is not very severe for Russia where redistribution ability of PAYG is limited. The Russian pension provision is universal and moderate. Thus it doesn't significantly increase the income of low-paid workers.
- There is no equitable distribution of benefits and costs across generations; while the first generation of beneficiaries typically receives considerably more than they contributed, future retired generations typically face lower rates of return on their contributions, particularly in the case of aging populations. The system also promotes intragenerational inequities, since different rates of return may apply for contributors within a given cohort, owing (for example, because of different life expectancies).

Problems related to risk

- Across the whole world pension funds are showing signs of financial stress, making the future size of public pension benefits and/or contribution rates uncertain. As the system matures, contributions start to fall short of what is needed to pay off the implicit pension debt. The budgetary costs of excessively generous benefits render unreformed systems financially unsustainable. It builds uncertainty into the systems. Both contributors and beneficiaries are placed under a risk, since either increased contributions or reduced benefits are likely to be required in the long-run to balance the accounts (the precise combination of adjustments could depend on the relative political weight on the groups of the population).

Advantages and disadvantages of the Funded system

The adoption of the multipillar system with a mandatory funded pillar is typically justified by the expected economic and political advantages vis-à-vis PAYG systems.

Based on theoretical reasoning and empirical evidence, Hemming (1998) concludes that the rate of return on investment is most likely to exceed the implicit return on PAYG systems in most countries. It means that the funded system accelerates the financial market development and promotes savings and capital accumulation.

The funded system is more robust to demographic changes.

Shift to the funded pension scheme establishes a close link between contributions and benefits and thus reduces labour market distortions and a tax evasion.

From a political point of view, moving to a funded system is believed to represent a time-consistent policy and therefore is more credible than operating with PAYG.

On the other hand, the successful implementation of the funded systems requires a number of economic, institutional and political pre-conditions. Besides the adequate legal and regulatory framework, the establishment of which can take time, there is one important pre-condition that Russia lacks—an active financial market. The development of privately managed pillars would require at least rudimentary capital markets and an adequate regulatory framework to limit an investment risk. The move to a funded system also can impose a heavy fiscal burden on the transitional generations, which would have to save for their own retirement and contribute to the old system.

In addition, contributors face considerable risk, as pension benefits can fluctuate markedly and an adequate replacement rate is not guaranteed, since the funded systems do not have a redistribution component.

It's worth to note that the drawbacks of the funded system are mainly connected with the problems of transition to it. On the other hand, the

advantages of the system give it a potential to improve the performance of pension provision. It is very important in the presence of ill PAYG in Russia.

The scale of the reform, or, alternatively, α - the size of the funded pillar, should be determined by a comparison of benefits and cost of the transformation to a new system. An additional problem arises from the fact that the decision about the scale of the reform is taken by the elective government, which has its own, different from the welfare maximisation, interests. One of them is an intention to retain the power in the next period. Thus it has to take into account the fact that the transformation, accompanied by the tight budget, may significantly reduce current pensions and social stability. It undermines the support for the government during the next election campaign. Thus the elective government weights transitional costs higher than the expected gain, since the gain has long-run character, while costs have to be born in the nearest future.

Of course, it can be argued that the government can run a wide informational campaign to persuade people in the necessity of the tighter economical conditions. But it is unlikely to be very efficient in present conditions in Russia, where the trust of population to politicians about long-run gains after short-run losses were overexploited.

Let us turn to the main options for the government to finance the reform:

- (a) To use external sources (e.g. revenues from privatisation, a positive surplus in the budget, an explicit government debt etc.)
- (b) To reduce the number of beneficiaries through the tightening the eligibility rules for privilege pensions.
- (c) To increase contribution rates.
- (d) To improve a revenue collection.
- (e) To reduce the tax evasion.

Further we consider the potential of the sources for Russia.

- (a) It is unlikely to use the external sources. There is a lack of money available for social sphere. Even a present growth caused by the favourable

conditions on the oil market can not be a strong basis for the long-run gradual reforms. Huge international debts (borrowed previously) make it impossible to use this source. The lack of the trust of the economic agents to the government limits the opportunity to use inner loans.

- (b) The number of privilege pensions has already been reduced. A further reduction of the pension benefits is not possible since in Russia the average pension payment is not far above the minimum living standard. The government should take into account that pension recipients are 40-45% of the electorate and the worsening of their living conditions decreases support for the government during a next election campaign. The social security topic is traditional for the left-wing parties that are a political opposition to the present government.
- (c) The contribution rates are high. We've shown above that the further increase causes more severe evasion and can reduce the contribution inflow.
- (d) The revenue collection can be increased by a stricter punishment through an increase in probability to be caught or higher penalties. It implies the improvement of the whole economical situation. In the presence of high corruption and wide spread bribes in Russia the proposed measures may not change the evasion behaviour of the agents in the expected direction.
- (e) Since the sources (a)-(d) are exhausted, the particular attention is devoted to the inner sources of the transformation. By means of the model, it was illustrated that the very reconstruction of the pension system changes the individual behaviour. It reduces tax evasion and increases a revenue inflow to the Pension fund.

Since the mechanism of interaction between the reform and the change of the individual behaviour is so important, let us consider it in detail.

We can interpret α as a measure of changes or a scale of reform. A higher α implies that the more considerable changes in the design of pension system

has to be made. The deeper reconstruction demands higher expenditures. The main components of the transitional costs are:

- The costs of creating a new infrastructure: a new law provision, an informational campaign about changes for the population.
- The costs of creating a new management system: either in the form of one state management company or several private companies. In the last case the system of monitoring and control over the companies has to be designed.
- The expenditures of the provision of the current elderly to keep their living standard at least constant during the transition period. The proxy of constant living conditions can be the replacement rate, which is the ratio of a pension to a disposable wage.
- The costs of designing long-run investment programs for the pension money.

The costs of building a new infrastructure and management system are likely to be fixed ones, while the last two components of the transitional costs are variable. The Russian Transition Research Institute investigated the structure of the costs. By means of simulation model it was shown that marginal costs of transition are increasing in α . The main reason is a difficulty of financing the current pension benefits with the long run investment program under the strict budget constraints.

By setting higher α the government expects to get higher revealed part z . But the higher α implies the higher costs that can't be covered by the revealed surplus.

The shape of the indifference curves for the government in α - z space is drawn on the figure 2.2. As it is more and more costly to find the external finances for further reconstruction, which is indicated by the increase of parameter α , the higher revealed share is needed to keep the utility of the government constant.

The arrows show the direction of the increase of the utility level. The lower evasion/higher revealed share z increases contributions and makes the transformation less costly for the government. Thus it increases its utility level.

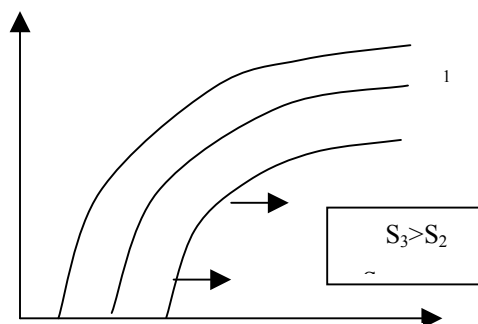


Figure 2.2. Indifference curves of the government.

2.3. Stackelberg sequential game

The interaction of the individuals and the government can be represented by the sequential 2-step game.

In the first step the government sets α - the share of the pension system that is organised according to the funded principle. It means that α is a share of contributions that is invested until the retirement period and hence withdrawn from the current distribution among recipients.

In the second step the individuals responses to α by setting z - the share of the wage that they reveal. The response function $z(\alpha)$ is a solution of maximization problem (2.1)-(2.3), (2.16) for given α .

The outcome of the game can be derived by the method of a backward induction. According to our assumption, there are no informational distortions among the players of the game. It means that the government knows the individual response function $z(\alpha)$, derived from the second step and sets α so as to maximise its own utility function (first-step problem).

The outcome of the game is shown on the figure 2.3. It is point A – the tangent of the individual response curve and the indifference curve of the government.

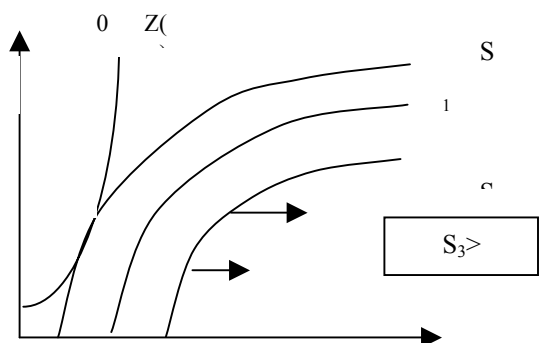


Figure 2.3. The outcome of the Stackelberg game.

The outcome is not Pareto-efficient. There is a whole set of (z, α) that is Pareto-improving. It is a shaded area on the figure 2.4. The higher values of z and α are more preferable for both the economic agents and the government.

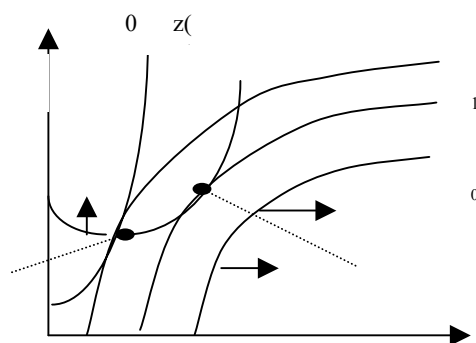


Figure 2.4. Pareto-inefficiency of the outcome of the game.

For example, consider the point C, which is a tangent point of indifference curves v and S_2 of the participants of the game. C is more

preferable as it leaves utility v of the individual unchanged and increases the utility of the government $S_2 > S_1$.

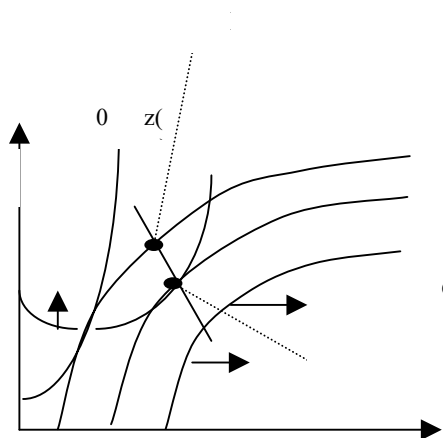


Figure 2.5. Pareto-optimal subset.

In the Pareto-improving set there is a Pareto-optimal subset – the part of a contract line between the points B and C. The contract curve is a locus of the tangent points of the indifference curves of the players: the indifference curve of the individuals v -s and the indifference curves of the government S -s.

The reason that the outcome is not Pareto-efficient is a lack of power of the government to elicit a larger share of the hidden income. It remains until individuals determine a share of the wage to reveal and the government has no instruments, other than increasing α , to squeeze higher z . Such instruments can be a frequent audit, high fines and penalties etc. In fact in Russia there are quite high penalties, but they can be easily reduced and overcome through bribes and collusion with dishonest bureaucrats. So we came to the necessity to solve a broader problem – to improve the environment in the whole economy. But this topic is beyond the scope of the paper.

So far I can draw several conclusions:

1. The funded system reduces the tax evasion better than PAYG. Besides, it doesn't distort savings and labour-leisure decision of the individual.
2. The outcome of the game between the government and the individuals is not Pareto-efficient until the share of the funded pillar is the only instrument used by the government to induce individuals to reveal their incomes. It holds as long as there exist the following conditions:
 - The pension reform is financed mainly from the inner source - the surplus of the revealed part of an income caused by the reform.
 - The scale of the reform is determined by the elective government. Because of its elective nature, the government puts higher weight on the costs of transition than on the long-run gains of the reform.
 - The marginal transition costs are increasing with the scale of reform because of the necessary institutional and economical arrangements and the obligation to provide the current pensioners.
 - The government has no tools, other than the very introduction of the funded pillar, to increase compliance. I.e. tools that can be used to constraint the utility level of the agent.

Chapter 3

There are several important factors omitted in the previous discussion. One of them is a labour market. In Russia the major part of the social tax is paid by the employer, not by the worker. Hence the labour market conditions affect the reform. The second factor is punishment. In the following chapter I consider the impact of punishment on the outcome of the reform.

In the end, I discuss the path of the current pension reform in Russia.

Labor market and uneven social tax distribution

In Russia there is a high unemployment. It gives a power to employers in their bargaining with workers when they negotiate the terms of contracts. In addition, the high unemployment leads to a flexible employment policy to be the dominant one for enterprises. It's very easy for a firm to find a workforce on the labour market. Thus the majority of enterprises don't care about their workers. It implies that employers have no incentives to pay the high social taxes from the payroll in favour of the workers. It accelerates the hiding problem and reduces the inflow to the pension fund.

It was discussed above that the introduction of the funded pillar increases tax compliance.

But the bias of the power to the employer seriously undermines the effect of the reform.

Let us turn to our model. To take into account the labour market situation I relax the assumption that it is the worker who pays the tax. Now it is the employer.

The worker is the one who benefits from the increase in the share of funded system α . It is in his interest to increase a revealed share of income in response to the increased funded pillar. But it is the employer who pays the social taxes. The payroll basis of the taxes increases labour costs of a firm. As it was mentioned above, under the present conditions a firm doesn't care about

its workforce. It doesn't gain from the increased compliance or increased share of the funded pillar. At the same time, it bears the costs associated with the increased compliance. As a result, a firm has much weaker incentives to reveal wage than an employee. In reality the compliance ratio is the outcome of the bargaining of the employer and employee influenced by such aspects as an audit frequency, the conditions of punishment for the tax evasion. For the time being I neglect the punishment policy to concentrate the attention on the changes made only by the introduction of the labour market influence. The nature of the labour market provides the employer with a significant bargaining power. Hence in the case when a firm determines a revealed share it will be smaller than that of an individual.

In terms of the model, it means that the individual response curve $z(\alpha)$ is steeper than the one in the original model. For the same share of the funded pillar, the larger part of the income is hidden. The shift is shown on the figure 3.1. The more power has the employer the higher the slope of the curve. In the marginal case we may get a vertical line.

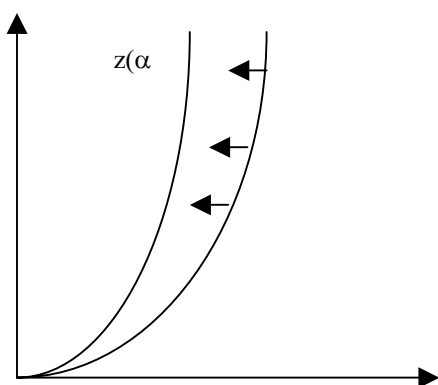


Figure 3.1. Shift of the response curve caused by the labour market conditions.

Thus the reduction in the tax evasion caused by the reform is smaller than expected. It is shown on the figure 3.2 that the outcome of the Stackelberg game shifts from the point A to B.

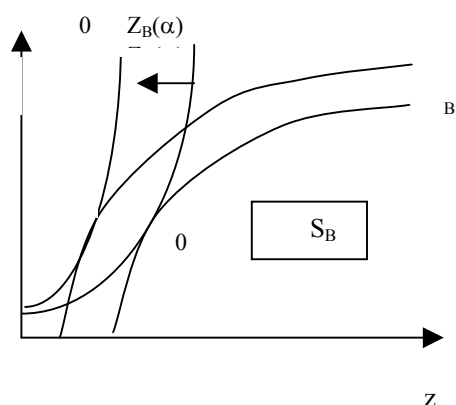


Figure 3.2. The result of shift in response curve on the outcome of the Stackelberg game.

Further on I'll mark the variables of the original model with subscript A and the variables of the model with the labour market conditions with the subscript B.

The outcome (α_B, z_B) remains Pareto-inefficient since the shift doesn't affect the reason of the inefficiency problem.

In the new outcome the government became worse off than in the original one, i.e. $S_A > S_B$.

Do the workers benefit from the shift?

It depends on the concrete outcome of the reform, i.e. on the changes of both α and z .

The introduction of labour market relations reduces the share of the revealed income $z_A > z_B$. So it undermines the influence of the reform on the tax compliance. The decreased share of the revealed outcome in the new outcome reduces pension benefits. It has a negative impact on the individual utility.

The total effect on the utility depends on the dynamics of α . Remind that the higher the share of the funded pillar α the higher the return on the pension savings for the individual and thus the higher the individual utility.

If the scale of the reform α_B is less than the original one α_A , the individual is worse off.

The individual is worse off even if α_B is slightly higher than α_A , but the corresponding increase of the individual utility is not enough to outweigh the decrease of the utility caused by the decrease of pension payment because of decrease of z .

The case of the reduction of the individual utility is illustrated on the figure 3.3.

It is worth to note that the two response curves correspond to the different economic agents. The original one $z_A(\alpha)$ is the response of the worker, while the shifted one $z_B(\alpha)$ is the response of the employer. The employer doesn't take into account the whole benefits of the reform for his worker, while bears the costs.

The utility curve of the individual v_A that passes through A corresponds to higher utility level than that of B (v_B). It means that the unemployment, which weakens the worker's bargaining power against his employer, makes him worse off.

In this case, both the government and workers are better off when worker determines the revealed part of the wage by himself.

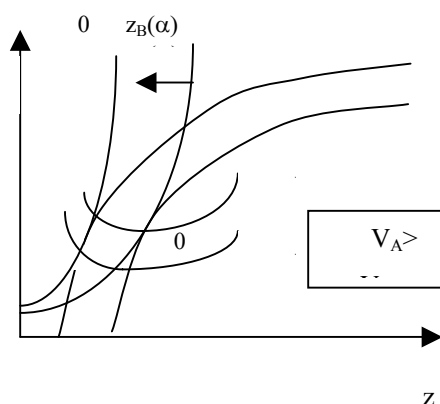


Figure 3.3. The reduction in the utility-levels of individuals.

It is possible to get α_B significantly higher than α_A . The scale of the reform doesn't directly affect the behaviour of the employer with respect to the tax

evasion. There is an indirect influence through the worker, which is weak in Russia under the present labour market conditions. It reduces the power of the government in the game. The government now has to set higher α than in the original case to get the same compliance.

It may be the case that the increased share of the reform, and the consequent increase in the return on pension contributions, compensates the reduction of the individual utility caused by reduced z .

This case is illustrated in the figure 3.4.

1.1.2

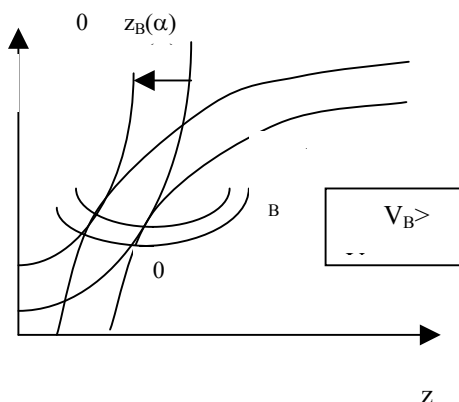


Figure 3.3. The increase in the utility-levels of individuals caused by higher scale of the reform.

What measures can be suggested to reduce tax evasion problem?

Beside the general recommendations about the improvement of the whole situation concerning the trust of population there is one more concrete advice: to reconstruct the social tax base.

Current distribution of the pension tax between an employer and employee is 28% and 1% (for the social taxes it is 35,6% and 1%, correspondingly). The high contribution rates create a large wedge between the cost of labour and the employees' take-home pay. Together with the flexible employment policy and the low motivation of employer to pay the taxes, it encourages tax evasion and a growth of informal activities.

One of the solutions is to redistribute a payment of the social taxes: increase the share of employee and decrease the share of employer. The current distribution is the heritage of the soviet welfare system. At that time the enterprises were responsible for the wellbeing of the workers, provided a social net and paid social taxes. It wasn't a heavy burden for the enterprises because of the soft budget constraints.

Let us take a look on the table 1.1 in the first chapter ("Pension and social tax rates, mid-1990"). There are distribution of taxes between an employer and worker for several countries. Many countries have more even distribution of the taxes. We can notice that in all the countries of the Former Soviet Union the tax distribution is similar to the Russian case. It also supports the above explanation about the inherited soviet tax system.

A more even distribution of tax burden means that the employees, the ones who are interested in increasing compliance, pay the higher part of the taxes. It increases the revealed part of the income and shifts the response curve to the right.

This shift is illustrated on the figure 3.4

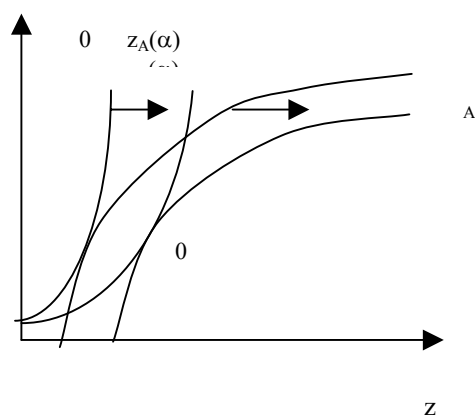


Figure 3.4. Effect of more even distribution.

Point A is a Stackelberg equilibrium under uneven tax distribution, while B corresponds to more even distribution.

The revealed share is higher in the case of more even distribution $z_B(\alpha) > z_A(\alpha)$. The government is better off as $S_B < S_A$.

The employers benefit from the decrease in the social tax burden.

But we can say nothing about change in utility of the worker since it depends on the change in the scale of the reform α . I've discussed it quite thoroughly above. Here I just mention one additional reason, which contributes to the reduction of the individual utility. Because of the weak bargaining power the individual is unlikely to get any compensation in terms of a higher wage from the enterprise.

Punishment policy and tax evasion

In the previous discussion I omit punishment, since the intention was to look on the "pure" relation between the size of the reform and the reduction of the tax evasion as a source of financing the reform.

Let us now introduce the punishment opportunity to the model. It is important to emphasize that the attention is devoted not to the punishment itself but to its impact on the reform.

The punishment policy can be designed in a several ways: with a fixed penalty or the penalty that is linked to the hidden amount.

Denote an expected penalty payment as Q .

Let us first consider the simple form of the expected penalty payment

$$Q = p((1-z)\tau w + F) \quad (3.1)$$

Where p is the probability to be caught. It doesn't depend on the hidden part. The payment consists from a fixed penalty F and the hidden part of the contributions $(1-z)\tau w$.

The individual maximization problem becomes:

$$\text{Max } v(c_{1,t}, c_{2,t+1}) = U(c_{1,t}) + (1+\theta)^{-1} U(c_{2,t+1}) \quad (3.2)$$

Subject to the budget constraints for the two periods:

$$c_{1,t} + s_t = w_t - \tau z w_t = (1-\tau z)w_t - Q \quad (3.3)$$

$$c_{2,t+1} = R_{t+1}s_t + (\alpha R_{t+1} + (1-\alpha)G_{t+1})(\tau z w_t + p(1-z)\tau w_t) \quad (3.4)$$

It is worth to note that under the punishment policy the discovered part of a hidden income is added to the pension contribution. Thus there is only one harm to the utility level of the individual – the fixed penalty F .

The system of the first order conditions corresponding to the problem is (3.5), (3.6).

$$\frac{\partial v}{\partial s} = -U_1' + (1+\theta)^{-1} R_{t+1} U_2' = 0 \quad (3.5)$$

$$\frac{\partial v}{\partial z} = -U_1' (\tau w_t - p \tau w_t) + (1+\theta)^{-1} [\alpha R_{t+1} + (1-\alpha) G_{t+1}] U_2' (\tau w_t - p \tau w_t) = 0 \quad (3.6)$$

From the systems of the first order conditions we can obtain the effect of the scale of the reform on the revealed part of the income in the presence of punishment.

$$\frac{dz}{d\alpha} = \frac{-U_2' (U_1'' + (1+\theta)^{-1} R_{t+1}^2 U_2'') + U_1'' U_2'' \tau w_t (z + p(1-z))(1-\alpha)(R_{t+1} - G_{t+1})}{U_1'' U_2'' \tau w_t (1-p)(1-\alpha)^2 (R_{t+1} - G_{t+1})} \quad (3.7)$$

It is easy to check that the ratio is positive.

Let us compare the impact of the reform on the tax evasion in the two cases with and without punishment, i.e. (3.7) and (2.18). There are two differences:

- In the numerator: term $z+p(1-z)$ in (3.7) instead of z in (2.18).
- In the denominator: term $(1-p)$ appears in (3.7).

Both differences make the ratio in (3.7) greater than (2.18). Hence the reduction in the tax evasion in response to the implementation of the funded pillar is larger in the presence of punishment. Let us emphasize that it is not the introduction of punishment that increases the revealed part z , but it is the reconstruction in the presence of punishment.

In terms of the graphical analysis it means that the individual response curve shifts to the right. The outcome of the game, revealed share z , is higher. It is worth to note that the punishment does not eliminate Pareto-inefficiency, since it affects the response curve without changing the reason of inefficiency – the lack of the government power to fix an individual utility level. The same

holds for a more even distribution of the tax burden, that was discussed earlier.

Current reform in Russia. New pension system

Let us turn to the analysis of the current pension reform in Russia.

Although the necessity of the reform was widely accepted, the very reconstruction of the pension system was launched only in the beginning of 2002.

Of course, partial changes and preparations were made before. In 2000 the informational infrastructure was created. It is built in accordance with the law 01.04.96 “Individual registering in the State Pension Insurance”. For every employee the database contains information about

- The period of working
- The wage
- The contributions paid
- The invested part of contributions and investment income on it. The part corresponds to the funded pillar.
- The period of working in the harmful conditions, that gives right for the privileged or additional pension.

The law determining new pension system passed in December 2001.

Since the beginning of 2002 the current PAYG is reconstructed to a new pension system.

The social tax rate and its distribution remain the same: 28% is paid by an employer and 1% by an employee. Thus the current reform neglects a potential source to increase the tax compliance through the increase of the share paid by an employee, who is more interested in the increasing contributions than the employer. The latter perceives contributions mainly as costs, since they don't bring any reward in the future.

In the new system $\frac{1}{2}$ of the contributions (14% of payroll) is collected by the state budget and is used for a basic part of the pension payment. The basic

part is equal for everybody. In fact, it means that the half of the pension system remains PAYG (Dutch type).

The other half of the contributions is collected by the Pension fund. Depending on the age of the contributor 2-6% of the payroll (6% for those who are under 35, 2% for the year range 35-50) is invested until the retirement period and then paid together with the investment income. It corresponds to the funded pillar.

The rest (8-12%) is taken into account when determine the pension payment. This part is distributed to the current recipients. Thus this part is organised as the German type of PAYG.

The pension benefit consists from three parts that correspond to the three pillars:

1. The basic part. It corresponds to the PAYG pillar (Dutch type). The eligibility to the part is determined by the 5-year working period. Its size is quite small and is linked to the minimum living standard. It's equal for all recipients.
2. The accumulated part. It corresponds to the PAYG pillar (German type). The part takes into account $\frac{1}{2}$ of contributions.
3. The accumulated and invested part that corresponds to the funded pillar. The part consists from the invested part of contributions and the investment income on it.

In terms of our model the government has chosen α from 0,07 to 0,21 for different agents in the transition period with 0,21 further for everybody.

In fact, the reform is quite moderate, especially if we take into account that the half of the pension system remained unchanged. The small share illustrates an anticipation of the government that the individual response curve is steep.

The moderate scale of the reform implies a quite small revealed surplus. The situation corresponds to the one described by the model.

Although the reform doesn't use the possibility to get finance through the increase in the compliance in a full manner, it uses another one that wasn't

described in the model. The new pension system creates incentives to increase a working period. The longer active period increases contributions and decreases survival after retirement. Both parameters are taken into account by the new pension system when determining the parts of the pension benefits that correspond to the funded and the German-type pillars, which are the largest parts of pension. It is worth to note that the direct increase of the pension age would be very unpopular.

Longer active period implies increase in the contributions and decrease in the dependency ratio. Thus it contributes to improvement of the solvency of the whole pension system.

Besides, in contrast with the previous system, a working pensioner has got a right to get pension benefits. Earlier he had a right either for salary or for pension.

New pension principle is implemented only for workers who is younger than 40. It makes the reform fairer, since it eases the double burden on the current generations and spreads the costs of reconstruction over time.

In the end I mention one quite serious but, hopefully, temporary flaw of the new pension reform. It is the absence of the law that regulates the investment of pension money. It builds a certain risk for the contributors and undermines the reduction of the tax evasion, caused by the reconstruction of the pension system.

Conclusions

There are several advantages of the Funded system in comparison with PAYG that made it very attractive in the present conditions of ageing of the population. They are a higher return on the contributions, more active capital markets, an increase in savings and investment (although there is a lot of discussion about it).

The flaws in the design of Russian pension system inherited from the USSR worsen the performance of the pension provision especially in the difficult transition period.

The reform was urgent since Russian pension system faces a very serious solvency problem. The demographic crisis, the weak compliance and the tax evasion reduce the contribution inflow, while loose eligibility rights and a lot of privilege beneficiaries increase the outflow.

It was decided to introduce a multipillar system. The introduction of the funded pillar was stipulated by its following advantages:

- A closer perceived link between contributions and benefits.
- A higher return on contributions.
- No distortions of the labour supply.

The reconstruction contributes to the increase in tax compliance and restores the solvency of the pension system. It is especially important in the conditions of the scarcity of the other sources of financing of the reform (e.g. a state debt, a reduction of the benefits, or an increase of the social tax rate).

The analysis proves the hypothesis that the introduction of the funded pillar reduces tax evasion.

However, as long as the scale of the reform is determined through the interaction between the self-interest elective government and individuals, the outcome of the reform is not Pareto-efficient. In the paper the interaction is analysed by means of Stackelberg game. The inefficiency of the outcome means that the scale of the reform (or, alternatively, the size of the funded pillar) and

the revealed part are not as high as they could be. Thus the reform doesn't reach one of its main goals – the increase tax compliance. It seriously undermines the ability of the new pension system to give a sufficient provision to the elderly. There are several conditions in Russia, which stipulate the inefficient outcome. They supplement each other:

1. The surplus of the revealed part of income caused by the reform is a main source for financing of the reconstruction of the pension system. External sources are limited by the debt-burden budget. An increase of the social tax rates is limited by their high level and its negative effect on the tax compliance. A contraction of eligibility rules as a source has been already exhausted. A further reduction of the benefits is not possible because of their low level.
2. Because of the necessary institutional and economical arrangements and the obligations to provide current pensioners the costs of the reconstruction are increasing with the scale of the reform. Gradually, the corresponding surplus becomes insufficient to cover the costs.
3. The scale of the reform is determined by an elective government. Because of the self-interests to retain the power, the government puts higher weight on current costs of the transition than on the long-run gains of the reform. The possible reason can be inability of the government to persuade citizens in the necessity to tighten living conditions in the short-run for the better pension provision afterwards. The situation is especially peculiar for Russia, where there is a lack of trust of the population to such kind of promises.
4. The government has no other tools (in addition to the very introduction of the funded pillar) to elicit an increase in compliance. I.e. the tools to constraint utility level of agent. The change in the power structure in favour of the government can eliminate Pareto-inefficiency.

It is worth to note that such a change in power structure can be unfavourable for individuals. Because if government can fix/constraint their utility levels, it may have a power to reduce the utility further down and made

individuals worse off. So even though the outcome is Pareto-inefficient it can be more favourable for individuals to have some inefficiency with the freedom, rather than to be squeezed by the self-interest government in the Pareto-efficient way.

The paper considers such instruments as a stricter punishment for tax evasion or a more even distribution of the social tax among employees and employers. These instruments reduce the tax evasion and increase the scale of reform. But still, they do not eliminate Pareto-inefficiency.

The result of our theoretical model corresponds to the way the current reform in Russia goes. The reform has a moderate scale. Thus it is likely result in small reduction of the tax evasion.

In the end I'd like to note that the major concern of the work is to give a description and a possible explanation of the slow progress of the current pension reform in Russia, rather than to give some recommendation on how to improve the situation. It stipulated a positive character of the paper, although I consider some policy measures.

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